Much of what we take for granted in medicine today—from the rigorous training of physicians and nurses to the emphasis on research and the rapid application of that research to patient care—emerged from innovations made more than a century ago at a brand new medical center in Baltimore: Johns Hopkins.

Indeed, today the very name Johns Hopkins means medicine to a majority of Americans, according to a recent Gallup poll. Hopkins now uses one overarching name—Johns Hopkins Medicine—to identify its whole medical enterprise. This $4 billion virtual organization unites the physicians and scientists of The Johns Hopkins University School of Medicine with the health professionals and facilities that make up the broad Johns Hopkins Health System.

A little history: Toward the end of the 19th century, American medical education was in chaos; most medical schools were little more than trade schools. Often, it was easier to gain admission to one of these than to a liberal arts college.

With the opening of The Johns Hopkins Hospital in 1889, followed four years later by The Johns Hopkins University School of Medicine, Johns Hopkins ushered in a new era marked by rigid entrance requirements for medical students, a vastly upgraded medical school curriculum with emphasis on the scientific method, the incorporation of bedside teaching and laboratory research as part of the instruction, and integration of the School of Medicine with the Hospital through joint appointments.

Hopkins medicine counts many “firsts” among its achievements during its early years: the first major medical school in the United States to admit women; the first to use rubber gloves during surgery; the first to develop renal dialysis and CPR.

Two of the most far-reaching advances in medicine during the last 25 years were made at Hopkins. The Nobel Prize-winning discovery of restriction enzymes gave birth to the genetic engineering industry and can be compared, some say, to the first splitting of an atom.
Also, the discovery of the brain’s natural opiates has triggered an explosion of interest in neurotransmitter pathways and functions. Other accomplishments include the identification of the three types of polio virus and the first “blue baby” operation, which opened the way to modern heart surgery. Hopkins also was the birthplace of many medical specialties, including neurosurgery, urology, endocrinology, and pediatrics.

**19 Years in a Row: The Johns Hopkins Hospital Tops U.S. News & World Report “Honor Roll”**

**HOPKINS’ 2009 RANKINGS**

The Johns Hopkins Hospital has once again — for the 19th consecutive time — earned the top spot in *U.S. News & World Report’s* annual rankings of more than 4,800 American hospitals, placing first in three medical specialties and in the top 16 in 13 others.

**Here are Hopkins’ 2009 rankings:**

**#1**

Ear, Nose & Throat (Otolaryngology) • Rheumatology • Urology

**#2**

Geriatric Care • Gynecology • Neurology & Neurosurgery
Ophthalmology (Wilmer Eye Institute) • Psychiatry

**#3**

Cancer • Digestive Disorders • Diabetes and Endocrine Disorders
Heart & Heart Surgery • Respiratory Disorders

**#5**

Orthopedics

**#6**

Kidney Disorders

**#16**

Rehabilitation
ABOUT THE BRADY UROLOGICAL INSTITUTE:

America’s #1 Urological Institute for 19 Years in a Row

Since its inception, the mission of The Brady Urological Institute has focused on finding answers, solving problems, and coming up with medical solutions that will benefit not only its patients, but humankind as a whole.

Whether it’s developing a new therapy, fine-tuning an improved surgical technique, discovering a cure for a disease, or seeking better ways to educate patients, every time Brady medical experts set out to do something—through careful observation, study, and detailed research—they are always envisioning how improvements can be made.

As the leader in urology, the Brady Urological Institute has far more than a vision for the future. The Brady continues to create the future through discovery, intense focus, constant improvement, and an ethic of service.

Patients come to The Brady for medical treatment in the following areas: prostate cancer, benign prostate hypertrophy, bladder cancer, incontinence, kidney cancer, stone disease, testis cancer, ureteropelvic junction obstruction, Peyronie’s disease, erectile dysfunction, male infertility, female urology, pediatric urology, minimally invasive surgery, robotic-assisted surgery.

The James Buchanan Brady Institute
Who Was Brady and Why Does the Institute Bear his Name?

James Buchanan Brady (1856-1917), the second son of a New York saloon operator, remains a legendary character from America’s “Gilded Age,” a thoughtful philanthropist whose legacy continues to fuel urological research.

Brady started working at the age of 11 to support his family, eventually getting a job selling special patented steel saws used for cutting railroad tracks. He soon developed an eye for diamonds and other jewels, and as his success as a salesman grew, so did his vast diamond collection, earning him the nickname “Diamond Jim” Brady.

As renowned as he was for his business acumen, Brady, who consumed vast quantities of food daily, was also well known for his prodigious appetite. Culinary historians note that his breakfast often started with a gallon of orange juice, a half dozen eggs, pancakes, fish cakes, and chops, with a succession of larger meals throughout the day that culminated in a dinner including dozens of oysters and clams, terrapin, lobsters, roasted meats, and a variety of game birds.

In 1912, Brady, who was already suffering from diabetes, kidney disease, and other ailments, developed severe prostate difficulties. After undergoing successful treatment at Johns Hopkins Hospital by Dr. Hugh Hampton Young, the ever-grateful Brady endowed the urological institute that now bears his name, allowing it to flourish right from its inception.
THE RESTORATION OF ERECTIONS FOLLOWING A RADICAL PROSTATECTOMY

JACEK MOSTWIN, M.D., D. PHIL., a Professor of Urology at Johns Hopkins School of Medicine and head of the Division of Reconstructive and Neurological Neurology, is one of the most experienced senior members of the Department of Urology performing pelvic and prostatic surgery. His focus on prevention and treatment of incontinence has been incorporated into more than 2,600 radical prostatectomies performed since the operation was first developed in 1982 by Dr. Patrick Walsh, with whom Dr. Mostwin has worked continuously for the entire 25 years since the operation was first developed. Dr. Mostwin brings this accumulated experience to the consulting room, bedside, and operating room to provide the best possible care for every patient.

It has been several months since your prostate cancer surgery and you’re starting to worry. While your physician has assured you that your prognosis for complete recovery from cancer is excellent, and you are elated about the state of your health, you’re also becoming concerned. With each passing week, it becomes increasingly obvious that you are not able to achieve an erection suitable for penetration.

The major job of the prostate—the muscular, walnut-shaped gland that sits directly under the bladder—is to produce part of the clear fluid that comprises semen. At orgasm, the pelvic and prostate smooth muscles contract, forcing this fluid into the urethra, where it mixes with sperm (made by the testes) and fluid (made by the seminal vesicles). During prostate cancer surgery, the seminal vesicles are removed along with the prostate, and the vas deferens is cut. No ejaculate will ever be produced again.

Sitting on either side of the prostate are two neurovascular bundles—the wafer-thin packets of nerves essential for erection. When these nerves are damaged or removed during surgery (or harmed by radiation), erectile dysfunction (ED) results. For some men, erections never return. For others, it can take as long as four years to get a reliable hard erection (without the use of medication) suitable enough for penetration.
Radical prostatectomy, brachytherapy (“seeds”), and external radiation therapy can affect the neurovascular bundles (erectogenic nerves) surrounding the prostate and therefore the ability to achieve an erection suitable for intercourse. The loss of this ability is not caused only by prostate cancer treatment. Other medical conditions, such as diabetes, obesity, Parkinson’s disease, hypertension, and atherosclerosis, also cause ED.

ED has a profound effect on the lives of the people it touches. Some marriages and long-term relationships have been destroyed by it. Sex, of course, is not the only
component of a strong and lasting relationship, but it is certainly an important one. However, if ED is a problem, there are several ways to treat it, and doing so, can help a man strengthen or renew the bond to the person he most cares about.

For every man who is worried about the possible loss of erections after a prostate cancer procedure, for every man who has already lost his ability to have an erection, and for every partner who ever wondered what to do, there are now several viable medical options to consider: oral medications, non-invasive devices, injections, and surgical implants. Each will be covered in detail in this article. In addition, because ED can have such dramatic effects on personal relationships, intimacy issues will be addressed. However, before going any further, let’s review the physiological factors involved in erections—what can go wrong and how problems can be prevented.

Erection Mechanics

An erection is dependent upon finely orchestrated actions within penile tissues, nerves, and blood vessels. Additionally, the lifting action and maintenance of a firm erection requires good blood flow—which is regulated by the central nervous system—and the ability to trap the blood in penile spongy tissue.

Erections that occur during normal sexual activity begin in the conscious brain, with a nervous system response to either real or imagined erotic stimulation. This leads to a change in the penis from flaccid (soft) to tumescent (swollen) to erect (rigid).

The shaft of the penis holds two individual chambers called the corpora cavernosa. An expandable, spongy tissue fills the chambers, extending from the base to the tip of the organ. This tissue contains blood vessels and smooth muscles. The urethra, the channel for urine and ejaculate, runs along the underside of the corpora cavernosa. A membrane, called the tunica albuginea, surrounds the corpora. In the normal, flaccid state, the smooth muscle constricts the blood vessels and keeps blood out of the penis.

An erection is initiated when the brain senses something arousing. Impulses are sent
from the brain to the lower part of the spinal cord, through the pelvic nerves, and to the penis. Nerve stimulation (most likely induced by nitric oxide, a gaseous molecule) causes the smooth muscles of the penis to relax. This allows increased quantities of blood to flow in through the right and left cavernosal arteries, filling the space within the cavernosa. Blood flow has to increase to about six times its normal rate to fill the penis and cause it to become longer, wider, and harder. Like a sponge, the corporal tissues then quickly expand with blood, engorging and enlarging the penis.

As the corpora cavernosa continue to swell, they press against the veins that normally allow blood to flow out, effectively preventing it from leaving. The tunica albuginea also helps to trap blood within the corporal bodies by creating a fixed resistance, allowing an increased pressure to occur.

Finally, engorged with blood, the corpora become rigid and erect, making the penis firm enough for penetration. As long as the inflow of blood is maintained and outflow prevented, the erection will be sustained.

**Erection Difficulties Following Prostate Surgery**

Surgical removal of the prostate can interfere with an erection or prevent one from occurring. ED can occur after a radical prostatectomy if the nerves that innervate the penis are removed or damaged, or if the blood supply to the penis is compromised during surgery. Prior to the pioneering work of Patrick Walsh, M.D., The Johns Hopkins University Distinguished Service Professor of Urology and former Director of the Brady Urological Institute, 100% of men who underwent radical prostatectomy developed erectile dysfunction. The anatomic radical prostatectomy, pioneered here at Hopkins by Dr. Walsh, aims to preserve these neurovascular bundles in order to safeguard erectile function so long as nerve preservation will not compromise cancer control. Still, many men will experience varying degrees of erectile difficulties in the short-term period following their surgery. However, the good news is that if the operation is performed by a skilled surgeon, most men will eventually recover erectile function.

**Primary Causes of Erectile Difficulties After Surgery**

If you are experiencing ED after a prostate cancer procedure, the first thing to do is determine whether there were any signs of ED prior to the cancer diagnosis. You will need to review your medical history, considering the possible effects of the following problems. ED has a variety of causes, including:

- Nerve disorders
- Vascular problems
- Medications
Nerve disorders. The nerves are signal carriers that relay information from the brain to the penile tissues. Duly alerted, the blood vessels open, allowing enough blood to rush into the penis to make it rigid. If there is a problem with these nerves, however, either from prostate treatment (surgery or radiation therapy) or diseases that affect the nerves, the messages aren’t transmitted correctly. The outcome is an impaired erection or none at all.

One major cause of penile nerve problems is diabetes, a chronic disorder usually caused by an impaired utilization of insulin, the hormonal substance manufactured by special cells in the pancreas. It is now estimated that 35% to 75% of men with diabetes suffer from ED. More than half of men with diabetes experience the onset of ED within 10 years of developing the disease.

Having a genetic predisposition and being obese are the most significant factors for diabetes. Diabetes adversely affects the nerves, making it progressively more difficult for nerve impulses to reach the penis. In some cases, diabetes delivers a double threat: in addition to damaging nerves, it can also encourage atherosclerosis in the blood vessels, causing them to become blocked and interrupt blood flow to the penis.

Another situation in which delicate nerves can be damaged, causing erection problems, is when surgery is performed to remove cancer from the lower rectum or colon, or when any radiation therapy is delivered to the pelvic area. Multiple sclerosis (a progressive nervous system disorder) and Parkinson’s disease (a degenerative brain syndrome) also create neurological disturbances that can result in ED. Other nerve disruptions can be triggered by back surgery or by disc herniation in the lower back.

Vascular problems. The major cause of vascular erectile difficulties typically originates from problems with the two deep cavernosal arteries, or the larger arteries that feed blood to these cavernosal vessels. A man experiencing vascular problems may find that his erections become less firm than they once were. He’ll start out with a strong erection, but during the course of sexual activity it will begin to lose rigidity. Over time, he may begin to experience difficulty in having an erection at all.

The culprit is most often atherosclerotic narrowing, which diminishes blood flow through the arteries. This arterial narrowing, which begins when men are in their 20s, is mostly due to a high-fat diet, genetic predisposition, high blood cholesterol, or a combination of all three factors. As the blockage slowly progresses over the years, the arteries are unable to dilate enough to permit increased blood flow to the penis.

Medications. In many cases, ED is a side effect of a prescription drug. Currently, we are aware of more than 200 medications that can seriously compromise erections and sexual performance. The most common offenders are medications for high blood
pressure, heart ailments, and allergies. Medications used to combat depression—especially the serotonin reuptake inhibitors (SSRIs), such as Prozac, Zoloft, and Paxil—can be a culprit. Frequently, if a man is taking more than one medication—one for hypertension and another for depression, for example—the damaging effects are cumulative and can result in a complete loss of erectile function.

**Other issues.** Androgens (testosterone) enhance but are not essential for erections. Up to 20% of older men who have castrate levels of testosterone after treatment for prostate cancer can still maintain erections. Low testosterone levels may dampen libido (desire for sexual activity). Although testosterone supplementation for men with low hormone levels may increase their sexual urge, it almost never increases the ability to have an erection.

**Smoking** has a negative effect on erectile function. Nicotine, a key chemical ingredient in cigarettes, decreases arterial flow and blocks smooth muscle relaxation in penile tissues.

Finally, there is the outdated belief that psychological problems are the fundamental cause of ED. While there are men who do have serious psychological components to their ED, most of these men also have a physiological cause. The psychological part is often a response to their ED, manifested as depression or anxiety. It is rarely the case that psychological problems are the sole cause of ED.

I am regularly asked by physicians, and by my patients and their partners, about what steps can be taken to restore erectile function following prostate cancer surgery. Here are my answers to the most frequently asked questions:

**Q.** How do you bring up the topic of restoring a patient’s sex life after a radical prostatectomy?

**A.** Granted, prostate cancer cure and urinary continence are foremost on the minds of patients and their partners, but quality of life issues, such as sexual function and recovery of erections following a radical prostatectomy, are extremely important.

My approach is to be open with my patients about all subjects that may have been taboo in the past—sexual functioning being a major one. I am very direct. The conversation starts before the surgery, and it includes the patient’s partner. I explain that the quality of the erections is going to be affected by the cancer therapy, and that it may take a while to return. Early recovery of erections following surgery is not always possible. Some men, because of the nature of their cancer, will never be able to have a hard erection again unless they use medication (oral or injectable) or a vacuum device, or have a penile implant.

This also holds true for men who have radiation therapy. When I counsel patients who are
radiation therapy candidates, I tell them about the possible side effects of this treatment. There is a misconception that, as far as ED is concerned, radiation therapy is a more benign prostate cancer treatment than surgery. It is not. It is important for these patients to know that although ED may not occur immediately after radiation therapy, it may become apparent a few years later. I urge patients to discuss this important issue with their radiation oncologist.

Q. When can a man expect the return of a hard erection following a radical prostatectomy?

A. Patrick Walsh, M.D., Professor of Urology at Johns Hopkins, best known for his 30 years as the Director of the Brady Urological Institute (1974 - 2004) and for his pioneering work in the development of the anatomic approach to radical prostatectomy, has kept meticulous records on the 4,000 men he has operated on. According to Dr. Walsh, erection quality following a radical prostatectomy can be affected by many things, including:

- Sexual function before surgery
- Patient age
- Cancer stage
- Surgeon’s skill
- Preservation of neurovascular bundles during the surgery

“I always get SHIM [Sexual Health Inventory for Men] scores on everyone before surgery,” says Dr. Walsh. “If a man’s SHIM score is greater than 21, indicating normal sexual function, I tell him that if he is under the age of 60, he has a 90% chance of being able to have intercourse on more than half of his attempts. If he’s 60 to 67, I tell him that his chance is 75%. I also explain that sexual function will continue to improve over the course of the next four years.”

I have performed more than 2,500 radical prostatectomies over the years, and I have found that the return of erections depends on age. Young patients (aged 40 to 45) can expect a return of erections as early as two to three months, while men in their 60s can expect hard erections nine to 12 months after surgery, when bolstered by Viagra, Cialis, or Levitra.

Penetration can be achieved without complete return of rigidity. This is a function of the degree of vaginal relaxation and lubrication in the partner. It is related to the partner’s age and hormonal status.

H. Ballentine Carter, M.D., Professor of Urology at Johns Hopkins, is an internationally recognized expert in the diagnosis and treatment of prostate disease. In his surgical practice, Dr. Carter has performed more than 2,000 radical prostatectomies. These patients participated in a quality of life survey before and after surgery using a special questionnaire, which allows Dr. Carter to get an accurate picture of a patient’s post-surgery experience and recovery.

The graph on page 12 shows quality of life outcomes over four years in 704 men who under-
went surgery by Dr. Carter. The data demonstrate that most men have return of sexual function that mirrors their baseline function as measured by the questionnaire. As you can see, only a small percentage of men have long-term urinary leakage requiring protection.

**Q.** Following prostate cancer surgery, can a man achieve orgasm without an erection?

**A.** The prostate and seminal vesicles are removed during surgery, so a man can no longer produce ejaculate. However, what many men don’t understand is that they can still have normal sensation and a normal sex drive, and they can still achieve normal orgasm.

The main problem for these men is the inability to obtain an erection. But sensation and the ability to achieve orgasm are intact. While the ability to have an erection sufficient for intercourse is temporarily lacking, it can be enhanced or triggered with oral ED medication, a vacuum pump, or injectable medication.

**Q.** Are oral medications such as Viagra, Levitra, and Cialis effective for men who have erection difficulties following prostate cancer surgery?

**A.** Thanks to Viagra, Levitra, and Cialis, many erectile problems can be treated successfully and unobtrusively—as long as the erectogenic nerve bundles that sit atop the prostate gland have been spared during surgery.
THE SEXUAL HEALTH INVENTORY FOR MEN (SHIM)

NOTE: Each question has several possible responses. Circle the number of the response that best describes your own situation. Please be sure that you select one and only one response for each question.

Over the past six months . . .

1. How do you rate your confidence that you could get and keep an erection?
   1 Very low
   2 Low
   3 Moderate
   4 High
   5 Very high

2. When you had erections with sexual stimulation, how often were your erections hard enough for penetration (entering your partner)?
   0 No sexual activity
   1 Almost never or never
   2 A few times (much less than half the time)
   3 Sometimes (about half the time)
   4 Most times (much more than half the time)
   5 Almost always or always

3. During sexual intercourse, how often were you able to maintain your erection after you had penetrated (entered) your partner?
   0 Did not attempt intercourse
   1 Almost never or never
   2 A few times (much less than half the time)
   3 Sometimes (about half the time)
   4 Most times (much more than half the time)
   5 Almost always or always

4. During sexual intercourse, how difficult was it to maintain your erection to completion of intercourse?
   0 Did not attempt intercourse
   1 Extremely difficult
   2 Very difficult
   3 Difficult
   4 Slightly difficult
   5 Not difficult

5. When you attempted sexual intercourse, how often was it satisfactory for you?
   0 Did not attempt intercourse
   1 Almost never or never
   2 A few times (much less than half the time)
   3 Sometimes (about half the time)
   4 Most times (much more than half the time)
   5 Almost always or always

Please add up your totals for your score:

Total:_______

SHIM Score Results:
1-7: Severe ED
8-11: Moderate ED
12-16: Mild to Moderate ED
17-21: Mild ED
Although these medications do nothing to increase sexual desire, they do enhance performance once sexual desire has been aroused. The drugs have proven to be a tremendous treatment that has revolutionized the way we treat men with ED.

Q. If a man complains of not being able to achieve an erection, what do you do?

A. I recommend exploring minimally invasive therapies, such as the use of the oral erection medications. It is very important to realize that these drugs will not affect erectile function if there are no erectogenic nerves present. Therefore, it is very important to preserve—when possible—the neurovascular bundles during surgery.

On average, as many as 40% of patients who have had a radical prostatectomy with the nerve-sparing procedure will typically recover erectile function within six months, if it was good prior to surgery. Within 18 months, our figures here at Hopkins show that sexual function returns to 60% to 70% of patients.

Q. Why is there a delay in complete return of erectile function following prostate cancer surgery?

A. Microscopic bundles of nerves sit on either side of the prostate capsule, running into the corpora cavernosa. These nerves are partially responsible for triggering an erection. Damage that occurs to one or both of these bundles during surgery, or surgically removal of them because of cancer or error, may make a spontaneous erection impossible.

That said, erections involve more than just the nerve bundles. Erection difficulties might be related to indirect damage to the blood vessels that provide oxygen and nutrients to the penis.

Q. What is the best way to avoid damaging the nerve bundles?

A. At the Brady Urological Institute, the surgeons prefer the radical retropubic prostatectomy approach because it provides the best access to the prostate during surgery. Johns Hopkins surgeons enter through the abdomen, beneath the pubic bone, and remove the prostate between the bladder neck and urinary sphincter. The nerves course behind and to the sides of the prostate. With the retropubic approach, the surgeon can remove the prostate and leave these nerve structures intact.

This differs from the perineal approach to radical prostatectomy, where the incision is between the scrotum and the rectum. While there is less bleeding with this method—because the dorsal vein complex is not removed with the prostate—the surgeon still can’t see as well coming in this way. Also, the surgeon quickly encounters the area where the nerve bundles are located. Therefore, there is a greater potential for damaging these important nerves and preserving potency may be less certain.
Perineal prostatectomy is less often performed in the United States, but surgeons who are experienced with this technique report results equivalent to radical retropubic prostatectomy.

With technological advances in minimally invasive surgery, the radical retropubic prostatectomy is also performed using both robotic and laparoscopic assistance. For patients, minimally invasive surgery means potentially less pain, a shorter hospital stay, and faster recovery.

Pioneering laparoscopic research and innovative surgical techniques carried out at Johns Hopkins in the 1990s have helped define the use of laparoscopy as opposed to traditional open surgery, leading to an alternative form of treatment. Laparoscopy has revolutionized treatment options for patients requiring urologic surgery.

Laparoscopy (from the Greek words lapara, or flank, and skopion, a means of viewing something) is a type of surgical procedure in which small (one to two centimeters) incisions are made and plastic tubes (trocars) inserted through them to keep the channel open so that tools—including surgical instruments and the viewing telescope (laparoscope) with its minicamera—can be inserted. When the abdomen is inflated with carbon dioxide, organs can be pushed out of the way for access and better vision, allowing the surgeon to work while watching an external video monitor. The tools can be manipulated to make necessary repairs, just as if the abdomen had been cut open the old-fashioned way, but without the surgeon’s hands ever entering the patient’s abdomen.

Christian P. Pavlovich, M.D., Director of Urological Oncology at Johns Hopkins Bayview Medical Center, uses minimally invasive techniques for treating many urological conditions. The laparoscopic radical prostatectomy program at Johns Hopkins was initiated in 2001 to remove cancerous prostate glands. Since then, more than 700 successful procedures have been performed by Dr. Pavlovich and his colleagues. Our surgeons routinely perform six to eight laparoscopic prostatectomies per week through five one-centimeter “keyhole” incisions (each about the size of a dime) made across the mid-abdomen. Small laparoscopic instruments are used to precisely dissect the prostate gland, seminal vesicles, and vasa deferentia from the urethra and bladder.

Although the procedure is performed laparoscopically, the surgery adheres to the same anatomic principals of open surgery perfected by Dr. Patrick C. Walsh. Blood loss during laparoscopic prostatectomy is routinely less than 300 cubic centimeters (a low volume), and transfusions are rarely required. Patients typically go home two days after surgery and can return to regular activities within two weeks.

The introduction of the da Vinci robot (Intuitive Surgical Corporation of Sunnyvale, California) has taken the radical prostatectomy to a new dimension. Johns Hopkins currently has two robots in use. For the radical prostatectomy, six tubes are placed in the abdomen so
The robotic arms and other laparoscopic tools can be placed inside. The surgeon sits at the computer console about 10 feet from the operating table, looking into a special screen that provides 12X magnification, and manipulates the 18-inch robotic arms, which carry out the surgeon’s exact movements as directed by finger and foot controls.

The robot-assisted radical prostatectomy and robotic technology will only get better and more sophisticated with more surgeons using this technology in the future. Dr. Pavlovich and his colleagues are teaching a new generation of young doctors to perform minimally invasive surgery with the same quality and adherence to maximizing cancer cure while improving quality of life for their patients.

Q. Following a radical prostatectomy, when should a man begin penile rehabilitation?

A. Penile rehabilitation following prostate cancer surgery is recommended (see “Erection Rehabilitation After Radical Prostatectomy” by H. Ballentine Carter, M.D., on page 32). The theory behind it is based on the idea that early-induced sexual stimulation and blood flow to the penis may help facilitate the return of natural erections and therefore the return of unassisted sexual function.

“I encourage all patients, beginning four weeks after surgery, to experiment using ED drugs or a soft tourniquet at the base of their penis to treat venous leak,” says Dr. Patrick Walsh. “They can also use a vacuum erection device or injections if they wish.”

There has been enormous interest in using oral medication (Viagra, Cialis, Levitra) on a daily basis (or several times a week), with or without sexual activity, in the months following surgery. Most urologists have incorporated a regimen of penile pharmacological rehabilitation because there is enough evidence that the drugs may offer some benefit with little risk of complications.

At this time, many patients are not able to take part in a penile rehabilitation plan with oral medications because they are limited by insurance coverage for the medication. Some plans, for example, will pay for four pills per month, with additional medication costing $10 per pill or more. If you find that you are limited by your insurance plan, you can ask your doctor to prescribe the highest strength of, say, Viagra, and then score the pills into halves or quarters.

Q. How do Viagra, Cialis, and Levitra help trigger an erection?

A. During sexual arousal, the brain signals penile nerves to secrete a powerful vasodilator—nitric oxide—which triggers the release of another chemical called cyclic GMP (cGMP), causing blood vessels in the penis to relax and blood to rush in. As long as cGMP is being made, the penis stays erect. However, once cGMP production begins to drop off, another chemical—phosphodiesterase 5 (PDE5)—destroys the remaining cGMP.
Viagra and the other two drugs work in about 70% of men tested because they effectively block PDE5 action, maintaining cGMP levels, and thereby allowing the penile arteries to relax and blood to flow into the corpora cavernosa. Moreover, by preventing blood from flowing out of the penis, these erectogenic drugs help maintain a firm erection.

**Q. Is everyone a candidate for oral erection medication?**

**A.** Unfortunately, not everyone is a candidate for the erection drugs. Anyone taking medicines that contain nitrates, on a regular or as-needed basis, cannot use the medications. Blood pressure could suddenly drop to an unsafe level, resulting in dizziness. A heart attack or stroke could also be triggered.

**Q. What are some of the more common nitrate-based medications?**

**A.** They include nitroglycerin (sprays, ointments, skin patches, or tablets), isosorbide mononitrate, and isosorbide dinitrate. Also, nitrates are found in recreational drugs, including amyl nitrate or nitrite (“poppers”). If you are not sure if any of your medicines contain nitrates, or if you do not understand what nitrates are, ask your doctor or pharmacist.

> Anyone taking medicines containing nitrates, on a regular or as-needed basis, cannot use oral erection medications. If you are not sure if any of your medicines contain nitrates, or if you do not understand what nitrates are, ask your doctor or pharmacist.

**Q. What is an effective dose of oral erection medication?**

**A.** I start my patients on the maximum dose of the medication.

**Q. How should the erection drugs be taken?**

**A.** Take Viagra and Cialis about an hour before sexual stimulation is planned, on an empty stomach. Levitra has a slightly quicker onset of action and can be taken 30 minutes before sexual activity. If taken after a high-fat meal (such as a cheeseburger and French fries), the medicine may take longer to start working.

Some men find that after taking Viagra and Levitra at night, they still have responses suitable for intercourse the next day. Cialis, on the other hand, often continues to work for 30-plus hours for many men.
Remember that sexual stimulation is needed for the medicines to work; an erection does not just occur as a result of taking the drug. Also, it may be necessary to try the medicine a few times before an effect is seen initially.

**BUYING ERECTION DRUGS ON THE INTERNET**

In the marketplace, the rule is always *caveat emptor*—let the buyer beware—and it’s no different when buying anything on the Internet, where there are more than 1,400 pharmacy sites. Studies have reported that a significant number of the prescription medications sold online are counterfeit and do not contain the proper dosages of the drugs they purport to contain; some may not even contain any of the actual ingredients. A number of these unscrupulous Web sites operate out of third-world countries, far from the reach of the U.S. Food and Drug Administration and most law enforcement agencies from other countries.

**Q.** What if the erection medication doesn’t work?

**A.** Some men may find that, try as they might, these erection drugs do not produce a satisfying erection. Granted, some men do have advanced disease that thwarts the effects of the drug, but in many cases, it turns out that the men just don’t know how to use the drugs.

For example, researchers have found that many of the men who tried Viagra and said that it didn’t work (so-called “Viagra failures”) were actually using the drug improperly. Some had taken Viagra after eating a heavy meal, which interferes with the absorption of the medication. Others took a suboptimal dose (many were taking 50 mg instead of 100 mg, the highest dose), or they expected results too soon after taking the pill. Viagra can take 30 minutes or longer to kick in.

Still others completely overlooked the role of sexual stimulation (involving the partner more in the lovemaking process is important) in providing an erection. Then, too, some men gave up on the drug after trying it just once. Some men who had not been having sexual relations for some time were not able to interest their partner in resuming a sex life after the drug restored their erections.

Men need to realize that these drugs are not going to improve a flawed relationship, and that introducing one of these erection medications into a formerly sexless partnership could prove to be a powerful destabilizing force.

The first thing I do is make sure the patient is taking the medication correctly. Many men think they are taking a “miracle pill” and that all they have to do is lie in bed and wait for an erection. I reiterate that sexual stimulation is required for the three drugs to work effectively.
Sexual function hinges on a variety of factors, not just an erection drug. Has a romantic mood been set? Is the man in good humor? Is he rested? Has he not had too much to drink? All of these factors come into play and affect the eventual outcome.

**Q.** What happens when it becomes evident that none of the oral medications are helping to restore erectile function in a patient?

**A.** If Viagra or the two other drugs don’t work, I suggest using a vacuum erection device (VED) or trying drug injection therapy. A third, highly effective treatment is the surgical implantation of a penile prosthesis.

**Q.** How does a VED device work?

**A.** Vacuum erection therapy was created in 1961 by a long-time sufferer of ED. This plastic device—actually an external vacuum—can induce an erection. The better-made VEDs cost between $200 and $500 and are available with a physician’s prescription.

To achieve an erection, the user places the clear plastic cylinder over his penis and uses either a manual or special electrical pump to create negative air pressure in the cylinder. Regardless of the source of the erection problem, this vacuum causes the vessels in the penis to fill with blood, just as they would during a normal erection.

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The vacuum erection device (VED) is a non-invasive ED therapy. When an erection is desired, the VED is placed over the penis. A vacuum is created by withdrawing air, enhancing the flow of blood into the penis. The erection can be maintained safely for up to 30 minutes by the use of a rubber ring, which is placed around the base of the erect penis.

*Illustration: Jacqueline Schaffer*
Once an erection is achieved (it takes about two minutes or so), the user slips off a flexible tension ring from the bottom of the cylinder and places it around the base of his penis to keep the blood from flowing out. This maintains the erection once the cylinder has been removed. The resulting erection can be sustained for at least 30 minutes.

**Q. Does the VED have any advantages?**

**A.** From a practical point of view, a VED is one of the best ED treatments available. It's very effective, and works for almost everybody. There are no serious side effects when it is used properly, and it can be utilized whenever an erection is desired. About half of the men who purchase the device like it and keep using it.

**Q. What are the VED disadvantages?**

**A.** Many men and their partners don’t like the device because the erection it produces is not “normal.” Some pump users complain that their penis feels numb, or that it becomes discolored, misshapen, and cold to the touch. Many couples complain about the interruption of intimacy it brings to lovemaking. In addition, some men complain that the constriction ring at the base of the penis causes mild discomfort.

**Q. Is it difficult to persuade a man to inject his penis?**

**A.** Most men shudder at the thought when it’s first proposed to them. To help a man who will be trying injection therapy, I recommend that he and his partner have a teaching visit with his urologist.

At this teaching visit, the urologist should demonstrate how to draw up the medication, read the syringe, and clean the injection site. Using a special see-through rubber penis, many urologists teach men how to inject. It is important to learn how to inject in different spots around the penis to help prevent plaque formation. Once plaques develop, they can lead to scarring, and Peyronie’s disease (a permanent bending of the penis) can develop.

Most men are pleasantly surprised to learn that the injection really doesn't hurt. In most cases, injectable drugs bring on an erection within 10 minutes. The erection can last for 15 minutes, sometimes for as much as an hour.

**Q. Will injection therapy work for everybody?**

**A.** It usually takes one to three visits with an experienced urologist to get a medication and dosage that is right for the individual. Injection therapy works for 70% to 80% of all men suffering from ED. After undergoing a radical prostatectomy, some men experience pain and burning when injecting the drug alprostadil (also called prostaglandin E-1). Only 1% to 5% of men have this reaction, but it’s enough to prevent them from using the drug again.
Some men who undergo a radical prostatectomy with one or both neurovascular bundles spared still can’t achieve an erection after being injected. Although the nerves could play a role here, the problem may have more to do with anatomic variations in blood supply to the penis. Somehow, blood supply has been compromised during a normal prostatectomy and this contributes to the patient’s ED. Complicate this with other risk factors, such as partial nerve injury or diabetes, and an erection can become very difficult to achieve.

Q. Which injectable medication should be used?

A. Alprostadil, a powerful erection medication, can be taken by itself, but I have found that it causes pain too often, so I rarely recommend it. I will oftentimes recommend that patients start with bi-mix—a mixture of papaverine and phentolamine. If the results are not satisfactory with bi-mix, I will try tri-mix—a mixture of alprostadil, papaverine, and phentolamine.

The specific formulation of tri-mix drugs to be administered is based on the type of erection achieved with test dosages. Again, patient comfort, the degree of erection obtained, and the time it takes for the patient to lose the erection must be carefully observed. The usual dose of phentolamine can range from 0.5 to 2 mg; 30 mg or less for papaverine; and 5 to 40 micrograms (mcg) for alprostadil. After the exact dosage is determined, the medication is compounded at the pharmacy. This drug must be kept refrigerated until the patient is ready to inject it.

Q. How long does it take to achieve an erection with tri-mix?

A. After receiving the dose, the man will achieve an erection within five to 20 minutes as a result of the relaxation of smooth muscle tissue, the dilation of main arteries, and blood filling the penis. The erection can last between 30 and 90 minutes, becoming more rigid with sexual stimulation. However, the erection does not always disappear immediately after orgasm or ejaculation.

While the injections have a high success rate—over 70%—the main cause of failure is usually due to the drugs’ inability to override poor blood flow to the penis. In some cases, although the tri-mix produces an initial erection, damaged veins in the penis allow blood to escape rapidly, resulting in an unsustainable erection.

Q. Do you recommend the use of Caverject?

A. Caverject, a 1996 FDA-approved prescription drug, is more expensive than tri-mix: $20 to $25 for each injection vs. less than $10 for tri-mix. Two different dosages of alprostadil are available, pre-loaded in a disposable, single-dose syringe. Injected directly into the penis, the drug increases blood flow, producing an eventual erection. Many men like the convenience of Caverject, which simplifies the injection procedure and doesn’t need refrigeration.
Q. Do you recommend MUSE?

A. MUSE—available since 1997—employs a small, specially-designed plastic plunger that is placed in the tip of the penis. Once the plunger is pressed, a rice-size pellet of medication (alprostadil) is pushed into the urethra. Moisture left by urine causes the pellet to dissolve, triggering an erection minutes later.

I recommend MUSE for patients who don't achieve success with oral medications and don't want to try injectable drugs, or else have Peyronie’s disease (curvature of the penis) and are not candidates for injection therapy. Certainly less invasive than a hypodermic injection of medication, MUSE, an acronym for “medicated urethral system for erection,” is a viable option for a select group of men.

Many men complain of a burning pain in the penis after the drug has been inserted, and there is a small risk of urethral injury. As with the injectable medications, your doctor needs to titrate the correct dosage of MUSE for you. Some men may require double or triple the standard dose, while others are so sensitive to the medication that they have fainted with the lowest test dose. I advise you not to change dosages on your own at home.

Some men are dissatisfied with the overall effect of the pellet on erections. The penis can sometimes become large and hard at the top, where the medication had dissolved, but farther back, it can be soft and wobbly.

Q. What happens if an erection will not go down after 90 minutes and you develop priapism?

A. To be certain that your doctor has created the appropriate dosage for you, your erection should be over by the time you leave the doctor’s office on your test visit. Patients typically achieve an erection within 20 minutes. The erection can last between 30 and 90 minutes, becoming more rigid with sexual stimulation. However, in rare cases (especially if a man mistakenly and incorrectly takes both an oral ED drug and uses injection therapy), the erection does not go down in a timely manner.

If too much of the drug has been administered, priapism—an unwanted, prolonged erection that lasts for longer than three or four hours—can develop. This painful and dangerous medical condition—named for Priapus, the Greek god of procreation—can lead to the destruction of erectile tissue and worsening ED if left untreated.

Thankfully, priapism can be reversed. Here is what I instruct my patients do if they develop priapism from an oral erection medication or an injected erection drug:
• If an erection lasts for longer than 90 minutes, take the antihistamine Sudafed (60 mg, available without a prescription).
  • Lie down, apply an ice pack to the exposed penis, and wait one hour.
  • If the erection is still persistent, the patient is instructed to call me on my cell phone; I then refer him to the hospital emergency department or my office, depending upon the time of day.
  • At the hospital or in the office, the patient will have the medication phenylephrine injected into the penis to reverse the erection.

The three-part inflatable penile prosthesis consists of a reservoir that is implanted in the lower abdomen, a pump that is placed in the scrotum, and two cylinders that are placed in the corpora cavernosa of the penis.

The system is filled with saline solution. When the two-hour procedure is completed, the device is totally concealed within the body.

Illustration: Jacqueline Schaffer
Q. When should a man consider penile implant surgery?

A. If oral erection medication and injectable drugs don’t alleviate ED, and if a man does not want to use a vacuum device, then it is time to think about a penile implant. The implant is ideal for a man who wants a natural-looking erection and a permanent, long-term solution to ED.

Q. How does an inflatable penile implant work?

A. Two extremely compact hollow cylinders, which come in a variety of widths and lengths, are surgically implanted within the penis. A small container that holds fluid for the cylinders is inserted in the lower part of the abdomen and a pump is implanted in the scrotum. The patient squeezes the pump several times, which transfers the fluid from the container to the inflatable cylinders, which then expand, widening and lengthening the penis. To reverse the erection, the valve at the top of the pump is squeezed and the fluid returns to the abdominal reservoir, causing penile flaccidity.

Q. What are the pros and cons of the penile implant?

A. The inflatable implant has the significant advantage of allowing an instant erection. The disadvantage is the inherent complexity of a mechanical device. When a problem occurs with the implant, surgery is needed to fix it.

Q. How is penile implant surgery performed?

A. The surgery is actually quite simple and straightforward: It is a two-hour procedure in which compact hydraulic devices are inserted through a two-inch incision. While the surgery can be performed on an outpatient basis, I like my patients to stay overnight so I can monitor them more closely.

Q. Is every man a candidate for a penile implant?

A. No. Any man who is immunosuppressed is not a good candidate for a penile implant because healing after the surgery would be compromised and infection risk would be too high. A man undergoing chemotherapy or radiation therapy, or a patient who has had previous pelvic radiation, is not a good candidate because of subsequent tissue damage.

Q. Can an artificial urinary sphincter and a penile implant be placed during the same surgery?

A. Yes. When a man still has urinary incontinence in the 18 to 24 months following his cancer surgery, he may decide to have an artificial urinary sphincter inserted to help regulate urine flow. An experienced urologic surgeon can perform this dual surgery.
To inflate the penis and achieve an erection, the pump bulb in the scrotum is squeezed several times, causing saline solution to move from the abdominal reservoir, through the tubing, and into the two cylinders. Full rigidity is achieved as the cylinders are inflated.

To deflate the device, the valve portion of the pump is pressed and held, which causes the saline solution to leave the two cylinders and go back to the reservoir.

Illustration: Jacqueline Schaffer
Q. If a penile implant works so well, why isn’t it recommended first for erection problems?

A. A penile implant is indeed one of the best treatments we have for ED. Implants have the highest patient and partner satisfaction rating, running higher than 90%. The reason they’re offered last is because of the surgery involved. In addition, if removal of the device is necessary, the other erectile dysfunction treatments will no longer be effective because corporal tissue is destroyed with implantation.

Q. What are the risks with a penile implant?

A. While the device is relatively simple to install by an experienced urologic surgeon, infection occurs in about 2% of cases. If it does, the implants have to be removed. Depending on the degree of infection, another implant may be reinserted immediately or after sufficient healing. However, in rare cases, scarring may be so severe that subsequent re-implant may not be possible.

Q. While biology plays a critical role in erection and sex, what is the role of intimacy in a satisfying sexual relationship?

A. ED most often has a physical cause, and today, thanks to Viagra and the non-oral treatments I have discussed, the physiological aspects of ED can be treated successfully. However, without also addressing specific issues of intimacy within a couple—a critical component of a man’s emotional and sexual life—these treatments will take that man only so far.

Sex involves two people whose feelings must also be recognized. Many men shy away from talking about their sex life in general, and ED in particular, for a variety of reasons, including embarrassment, frustration, even fear. When there are sexual problems, emotional estrangement can quickly occur. Dealing with the problem in all its complexity is the only way to ensure a solution that yields satisfaction for both partners.

Without an emotional connection to your sexual partner, you won’t develop the deep, satisfying awareness that defines great sex. For those of you who took your sex lives for granted before your cancer surgery, this post-surgery time can serve as an excellent opportunity to reacquaint yourself with your partner. Not only do you have available the means to restore your sexual function, but talking to your partner about your sex life together can also bring new emotional perspective to your relationship, creating a stronger, more resilient bond that will enhance the sexual experiences for both of you.

Q. What are the best ways to initiate change in one’s sexual relationship?

A. When intercourse is no longer possible due to lack of a hard erection, many men are upset, angered, or embarrassed. It’s never easy for a man to admit that his sexual relationship
needs help. However, discussing the problem with your partner is an important first step in revitalizing a damaged sex life. Facing the many psychological repercussions that ED causes in men and their partners after a prostate cancer procedure is a very important part of treating the condition successfully.

Modifying one’s sex life takes work and time, but understanding those areas that are giving you and your partner trouble will make it easier. You always need to keep the lines of communication open. It’s paramount that you speak frankly with your partner about your condition. Be honest about your feelings, sexual needs, and desires.

Even if it is not possible to achieve sexual intercourse, it is still possible for sensual pleasuring to take place. I make this clear to the couple in our meetings. If the man had previously thought that sexual intercourse was the end point in a sexual relationship, I invite him and his partner to now write new sexual scripts for themselves. This often works to diminish any sexual estrangement between the couple.

Q. Is it difficult for a man to candidly discuss his sex life with a doctor?

A. Most couples have difficulty talking to each other about their sexual life. Many can talk about sex in general (for example, sex in the news), but when it comes to the individual and his partner, they often find it a challenge to talk about their sexual wishes and concerns.

Therefore, it really comes down to the level of comfort that’s established by the doctor with the couple. I am very open with my patients. “I’d like to get an understanding of how sex has been for both of you,” is a typical non-threatening question I ask. Oftentimes, through the ensuing dialogue, the couple comes to realize that it’s more than an erection, more than orgasm, that sexually attracts them to each other.

Q. If sex was a big part of a relationship, will the relationship be permanently broken if erections don’t return?

A. I would like to think not. I’m sure there have been instances where relationships are truly destroyed and the couple breaks up for good. However, estrangement and divorce are rare outcomes. In my experience, relationships are improved when there is an open dialogue, with both partners willing to share. Many women have admitted that because their sex life has shifted from a penis- and intercourse-centric sexual relationship to one with much more caressing and foreplay, their sex lives are better than before the cancer surgery.

Q. Does difficulty in achieving an erection—or the inability to have one at all—bring about a sexual reawakening in some men?

A. Yes, surprisingly, it does. Some men have been so intercourse-oriented that they never really understood the power of romance and what intimacy really meant for their partner. This has given
them an opportunity to focus more on the physical and emotional needs of their partner. Without being able to have an erection or to sustain one as before, they soon come to realize that something as simple as a hug or gentle back rub or massage are truly intimate acts. Since a large majority of women do not orgasm with vaginal intercourse alone, sexual stimulation and focus on the female partner’s needs often brings closeness to the couple that may have not previously existed.

Synchronizing your sexual longings with those of your partner will reward you repeatedly. If your sex drive or your partner’s has slackened off, you owe it to yourselves to find ways to build it up again. This has to be a joint venture: If one person is in the mood for sex and the other isn’t, that’s obviously going to lead to a no-win situation. Finding that mutual connection takes time and thoughtfulness.

ED following a radical prostatectomy is really a couple’s issue. It’s a matter of the couple being educated about various options and then, being respectful of their esthetics and values, having them understand that they are being given permission to broaden their sexual scripts, to have more variety than there might have been. The couple has to come to realize that it’s this sensual pleasuring of each other that can preserve, restore, and enhance the intimacy between them.

<table>
<thead>
<tr>
<th>PROCESS</th>
<th>ACTION</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient/Partner Assessment</td>
<td>At the pre-surgery meeting, the doctor explains potential sexual side effects and outlines strategy for restoring erections.</td>
<td>Patient and partner are psychologically prepared for post-surgery erection difficulties.</td>
</tr>
<tr>
<td>First-Line Therapy</td>
<td>• Penile rehabilitation begins with oral PDE5 inhibitors (Viagra, Cialis, Levitra). • Vacuum device is used if PDE5 drugs don’t work. • Couples counseling.</td>
<td>• Erection suitable for intercourse is achieved. or • Erection difficulties persist.</td>
</tr>
<tr>
<td>Second-Line Therapy</td>
<td>• Injection therapy is initiated. • Intraurethral injection (MUSE) is recommended if injection therapy fails.</td>
<td>• Erection suitable for intercourse is achieved. or • Erection difficulties persist.</td>
</tr>
<tr>
<td>Third-Line Therapy</td>
<td>Penile implant surgery</td>
<td>• Erection suitable for intercourse is achieved.</td>
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Nothing makes more of an impact on a man’s sexual health than his lifestyle. These modifiable risks include obesity, smoking, and excessive drinking. Erectile dysfunction can result from a combination of these factors, and when all three risks are part of your health profile, you run an even greater chance of developing ED.

Additionally, medical problems like high blood pressure, diabetes, and high cholesterol, if already present, need to be controlled. Compliance with medications, together with lifestyle modifications, are the best bets for optimal penile health.

You can begin to take charge of your sexual health right now. Here are the first steps you can take to immediately implement healthy changes that can prevent or help overcome ED or restore full sexual function after a prostate cancer procedure:

**Stop smoking.** Of all the behaviors that can damage your health, none has been more thoroughly documented than smoking. Not only does it promote heart disease and cancer, but when combined with other risk factors, its negative effects on ED also increase dramatically.

**Lose weight.** While obesity itself is not a direct cause of ED, being overweight is associated with hypertension, diabetes, and atherosclerotic arterial disease, which in turn are linked to the condition.

**Reduce or eliminate alcohol consumption.** Alcohol in small amounts can improve erections by reducing anxiety and dilating blood vessels. However, in large amounts, alcohol can cause ED due to sedation and a decrease in libido.

**Exercise regularly.** Regular exercise improves cardiovascular function and may improve blood flow to the penis and other organs. Also, it can lower your percentage of body fat, which can positively alter personal attitudes about sex—that is, staying in shape, fit, and strong can enhance your self image and sexual confidence.

If you are experiencing ED, no matter what the cause, speak to your physician. If your ED is related to your prostate cancer, talk to your urologist about your options.

**Q.** How do you know when a couple needs counseling?

**A.** When, for either partner, it starts to hurt too much emotionally. The earlier a couple seeks counseling, the better the results. If you find that you cannot satisfactorily resolve your problems, I urge you and your partner to seek additional help. I believe you will find that sexual counseling can be an effective way to strengthen and deepen a relationship while regaining lost pleasure.
<table>
<thead>
<tr>
<th>Therapy</th>
<th>Effectiveness</th>
<th>Directions</th>
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<tbody>
<tr>
<td>Cialis</td>
<td>Very effective for up to 36 hours when used according to instructions. Very potent. No visual effects. Less effective for men with diabetes and will not work in men who have had both erection nerves removed during prostate cancer surgery.</td>
<td>Best effects when taken one hour before a sexual encounter but can be highly effective in 30 minutes. Less affected by food. Available in 10 mg and 20 mg. Do not take more than one pill in 24-hour span.</td>
</tr>
<tr>
<td>Levitra</td>
<td>Very effective for up to 10-12 hours when used according to instructions. Very potent. No visual effects. Less effective for men with diabetes and will not work in men who have had both erection nerves removed during prostate cancer surgery.</td>
<td>Best effects when taken 30-60 minutes prior to a sexual encounter but can be highly effective in as little as 10 minutes. Less affected by food. Available in 10 mg and 20 mg. Do not take more than one pill in 24-hour span.</td>
</tr>
<tr>
<td>Viagra</td>
<td>Very effective for up to 4-5 hours when used according to instructions. Less effective for men with diabetes and will not work in men who have had both erection nerves removed during prostate cancer surgery.</td>
<td>Best effects when taken one hour before a sexual encounter but may take 15-30 minutes to work. Less effective if taken with food. Available in 25 mg, 50 mg, and 100 mg formulations. Do not take more than one pill in 24-hour span.</td>
</tr>
<tr>
<td>Penile injection</td>
<td>Very effective therapy, even for men with ED caused by prostate surgery. Best effects when injected 5-20 minutes before sexual intercourse.</td>
<td>Hardness lasts 30-60 minutes. The use of a prescription penile band can ensure optimal hardness.</td>
</tr>
<tr>
<td>Vacuum erection device</td>
<td>Very effective therapy for all types of ED.</td>
<td>Place the plastic tube over the penis and pump the device to create an erection.</td>
</tr>
<tr>
<td>Implant surgery</td>
<td>The most effective therapy. Produces instant erections on demand.</td>
<td>Lightly squeeze the pump in the scrotum to expand and lengthen the penis.</td>
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If a major teaching hospital in your areas has a department of sexual health connected with the psychiatry or urology department, call and ask for a referral. If not, check your county medical society or state psychological association.

You want a mental health professional who is experienced in sexual dysfunction and related disorders, who has treated post-surgical prostate patients, and/or who has had some experience with patients with a chronic illness.

For the uncomplicated post-prostatectomy couple, with the strengths and weaknesses of most couples, therapy may consist of two to three months of weekly counseling sessions.
Erection Rehab After Radical Prostatectomy

An aggressive approach may lead to quicker recovery of sexual potency following surgery

H. Ballentine Carter, M.D., is a Professor of Urology and Oncology and the Director of Adult Urology at the Johns Hopkins University School of Medicine. He is a practicing surgeon and a recognized expert in the diagnosis, staging, and treatment of prostate cancer. Dr. Carter pioneered the concept of PSA changes (PSA velocity) as a marker of prostate cancer presence and the use of free PSA to predict the behavior of prostate cancer.

Dr. Carter is working closely with colleagues at the Baltimore Longitudinal Study of Aging (National Institute of Aging) to track the incidence of prostate disease in men over time, as they age. These longitudinal studies could help identify risk factors involved in the development of prostate disease.

The founding medical editor of The Johns Hopkins Prostate Bulletin, Dr. Carter is currently a consulting editor to the journal Urology, and Medical Editor of The Johns Hopkins White Papers on Prostate Disorders. Dr. Carter is the primary author or co-author of more than six dozen major urological studies published in peer-reviewed journals, as well as the principal author or co-author of more than two dozen textbook articles on urology.

If you’re like most sexually active men facing radical prostatectomy (RP), one of your utmost concerns is whether you’ll be able to have sexual intercourse after the operation. While nerve-sparing surgery—in which a skilled surgeon preserves the cavernous nerves necessary to achieve a natural erection—has significantly improved the likelihood that you will regain erectile function, it might take a while. For the 60% to 85% of men who do regain sexual function, the average wait is about 18 months. For some men, it can take two years or longer for adequate erections to return.
But new research suggests that waiting for nature to take its course may actually make recovery of natural erectile function more difficult. These findings are the basis of a novel strategy called erection rehabilitation, in which erections are induced with medication several times a week in the hopes of hastening and increasing the odds of a return of sexual potency.

_Erection rehabilitation involves inducing erections with medication several times a week in the hopes of hastening and increasing the odds of a return of sexual potency._

**What’s Behind ED after RP?**

Even an expertly performed nerve-sparing RP causes some degree of trauma to the cavernous nerves. Located on either side of the prostate, these nerves supply electrical impulses to the corpora cavernosa, the two chambers in the penis that fill with blood to create an erection.

The source of the surgical trauma is unclear. But researchers speculate that it could result from stretching the nerves as the prostate is removed; application of heat during cauterization; reduced blood flow during efforts to control surgical bleeding; or inflammation in response to the surgery.

The trauma may cause degeneration of nerve fibers and loss of nerve connections to the corpora cavernosa. This, in turn, can lead to deterioration and shrinkage of the spongy tissue within the chambers. When these changes occur, blood may leak from the chambers, preventing you from developing or maintaining an erection.

**Use It or Lose It?**

The premise behind erection rehab is that achieving erections soon after surgery may help prevent tissue damage and restore normal sexual function sooner. One theory is that when the penis remains flaccid for many months (because the corpora cavernosa are not filling with oxygen-rich blood), the lack of oxygen damages the spongy tissue. Oxygen-deprived tissue overproduces collagen (the main structural protein found in connective tissue). Over time, the excess collagen causes thickening and scarring of tissue within the corpora cavernosa.

_The premise behind erection rehab is that achieving erections soon after surgery may help prevent tissue damage and restore normal sexual function sooner._
In contrast, a substance called prostaglandin E1 (PGE1)—which is produced in the presence of adequate oxygen—decreases collagen production and promotes healthy tissue. The pharmaceutical form of PGE1, alprostadil, is available as an injectable drug (Caverject, Edex) or as an intraurethral suppository (MUSE) and has been used for years to treat erectile dysfunction (ED). Alprostadil increases blood flow to the penis, producing an erection even when the cavernous nerves are damaged or removed.

One erection rehab strategy involves self-injecting alprostadil into the corpora cavernosa three times a week, starting four weeks after prostatectomy. The first report that early injection of alprostadil promotes a faster recovery of spontaneous (natural, unassisted) erections than no treatment came from Italian researchers in 1997. In a preliminary study, reported in *The Journal of Urology*, they found that eight of 12 men who began using the injections one month after nerve-sparing RP achieved spontaneous erections adequate for intercourse within six months, compared with only three of 15 men who didn’t use the injections. Similarly, the use of intraurethral alprostadil shortly after RP for six months shortened the recovery time needed to regain erectile function.

Some evidence suggests that early use of a vacuum pump also could help. A study in *BJU International* reports that using a vacuum pump at one month after RP produced earlier sexual function in men who had undergone nerve-sparing or non-nerve-sparing RP.

Of late, the oral ED drugs—sildenafil (Viagra), vardenafil (Levitra), and tadalafil (Cialis)—have become the erection rehab strategy of choice because they are noninvasive, convenient, and well tolerated. Although these drugs tend to be less effective in men who have undergone RP than in those who haven’t had the surgery, early use appears to offer some benefit.

Results from a recent randomized controlled trial in the *Journal of Sexual Medicine* show that men who took Viagra shortly after RP each night for nine months had significantly greater improvement in erectile function than men who took a placebo, and much of the improvement was seen within the first four months of treatment. Researchers aren’t completely sure why early use of the ED drug appears effective, but they speculate that the improvement is related, at least in part, to increased corporal oxygenation.

*Researchers aren’t completely sure why early use of ED drugs appears effective, but they speculate that the improvement is related, at least in part, to increased corporal oxygenation.*
Some doctors recommend that men who inject alprostadil three times a week also take an oral ED medication on the other days. This strategy may enable the men to use a lower dose of alprostadil.

The bottom line: No single treatment is effective for every man. You may need to experiment to find a method that works for you.

**Time Is of the Essence**

No matter which method you use, the best results occur when rehabilitation is started within one to two months of surgery, and many doctors evaluate patients for a rehab program as soon as the catheter is removed.

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*The best results occur when rehabilitation is started within one to two months of surgery.*

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A drug challenge is one way to determine which method to try first. With this approach, doctors suggest taking an oral ED drug at the highest dose at least four times during the first four to six weeks after surgery. If you are able to successfully achieve a firm erection in that time, you will continue to take the medication at least three times a week until you’re able to get a spontaneous erection or can achieve an erection suitable for sexual intercourse with the assistance of medication. If you’re not able to get an erection during the challenge, it’s probably best to begin with penile injection therapy.

**Is Erection Rehab for You?**

If you didn’t have ED before surgery and your doctor feels it’s safe for you to take an oral ED drug or use alprostadil, you’re likely a candidate for erection rehab. However, if you didn’t have a nerve-sparing operation or if you have diabetes or cardiovascular disease, you may not respond as well as a healthy man. In addition, you’ll need to stick with the regimen as prescribed to get the best results.

For some men, the cost of oral medications may be a concern because insurance coverage may be limited. Some plans will pay for four pills a month, with additional medications costing $10 a pill or more. If you find you’re limited by your insurance plan, consider asking your doctor to write a letter of medical necessity to the insurance carrier to increase the monthly allotment of medications.
Questions and Answers About Sex and Prostate Health

Hopkins doctors answer questions from patients on the topic of sexuality and prostate cancer

Sexual Activity Following a Radical Prostatectomy

Q. I am 77 years old and was in good health until I was diagnosed with prostate cancer near the end of 2007. Until then, my sexual activity had been satisfactory. I’m now near the end of my eight weeks of radiation treatment, having continued my daily walking and gardening with no signs of fatigue. What is the possibility of my being able to return to normal sexual activity? Vero Beach, FL

A. After radiation therapy, the ability to achieve and maintain erections is dependent upon the patient’s age and the quality of erections prior to treatment and patient age, as well as the extent of the cancer. A decrease in erectile function occurs months to years after treatment is completed because of the delayed effects of radiation therapy on tissues. In men between age 70 and 80, the likelihood of maintaining erectile function after radiation therapy would be in the range of 50%.

Viagra Dosage

Q. I am an active 82-year-old and am in very good health. Viagra at the 100-mg level has not been much help. My internist suggests that trying two 100-mg pills. Is this safe? Arlington, VA

A. 100 mg is the maximum safe recommended dosage for Viagra (sildenafil). I would not advise exceeding this dosage. Moreover, if a 100-mg dosage did not work, I don’t think doubling the dosage is likely to work either.

Viagra and Stomach Distress

Q. I am 61 and had a radical prostatectomy performed 14 months ago, with both nerve
bundles spared and no involvement of the lymph nodes. Although I experienced only mild stress incontinence shortly after the surgery when playing tennis (which has since completely cleared up), I virtually lost my ability to achieve a firm erection.

My erections are soft at best but seem to be getting firmer over that past few months. I have been using MUSE and am quite satisfied, even though placing the suppository in the urethra takes something away from lovemaking.

I recently tried 50 mg of Viagra, and although it seemed to work much better than MUSE, I had stomach distress for about four hours. My wife and I like the idea of using a pill. Is there any way to get around this Viagra stomach problem? Ossining, NY

A. Gastrointestinal disturbance with Viagra has been reported in about 17% of patients taking the drug. It is apparently less common at lower dosages, so you might want to try the 25-mg dosage. Also, a single dose of an antacid does not affect absorption of the drug, so you might try Mylanta or Maalox prior to taking Viagra.

Libido Issues After a Radical Prostatectomy

Q. I’m 56 and had a radical prostatectomy last year. One set of penile erection nerves was spared. Even so, I’ve been unable to achieve an erection, even with Viagra. Since the surgery, my libido has been significantly lower and my orgasm significantly less intense. Is this lowered sex drive/interest common after surgery? What do you suggest I do about it? San Francisco, CA

A. Loss of interest in sexual activity (libido) may occur when men are unable to achieve an erection satisfactory for intercourse. Consultation with a urologist who has an interest in sexual function is the most reasonable step. If the use of Viagra has not resulted in an erection, the options would be a vacuum erection device (pump), MUSE (the medicated urethral pellet), injection therapy, or a penile prosthesis.

Sexual counseling can play a critical role in the restoration of intimacy and should be considered by any couple with sexual problems. The choice of one treatment over another should be made by the patient and his partner in consultation with the urologist, taking into consideration the couple’s desires and expectations.

Painful Nocturnal Erections

Q. Six months after undergoing a radical prostatectomy (with one nerve bundle spared), I am waking up with a partial erection. However, when it comes to sexual activity, I get no response whatsoever. What’s going on here physiologically? Leeds, MA

A. There is clearly a dissociation—in some men—between the ability to have nocturnal
erectations and erections with tactile stimulation after radical prostatectomy. Unfortunately, the reason for this dissociation is not known, but as your question suggests, understanding this paradox may one day provide valuable information about erection physiology.

**Viagra and Benign Prostatic Hyperplasia (BPH)**

Q. Can you give me some information on the daily use of Viagra by men with benign prostatic hyperplasia (BPH)? Are there any drug interactions or side effects I should know about?

Via e-mail

A. Viagra was the first of a family of phosphodiesterase 5 (PDE5) selective inhibitors. These drugs increase blood flow to the erectile channels of the penis by dilating the small blood vessels in the smooth muscle chambers that become engorged with arterial blood during erection. PDE5 inhibitors work by amplifying the normal erectile response.

Viagra does not affect the bladder or the prostate itself, so rarely will it have any positive or negative effects on existing lower urinary tract symptoms. Likewise, Viagra will not interact with most of the commonly prescribed medications for BPH.

It is important to note, however, that Levitra (vardenafil), which is sometimes substituted for Viagra in treatment of erectile dysfunction (ED), can have very significant interactions with one class of drugs used for BPH symptoms, namely, alpha-adrenergic antagonists such as Hytrin (terazosin) and Cardura (prazosin). The combination of Levitra and Hytrin or Cardura can potentially cause a very serious drop in blood pressure.

**Restoration of Erections**

Q. Almost a year ago, at age 56 and in excellent health, I had a robotic-assisted radical prostatectomy. The cancer was confined within the gland. My surgeon told me that he was able to spare both nerve bundles, and my PSA dropped to the undetectable range and has stayed there.

I regained complete continence within six weeks but still experience erectile dysfunction. On doctor’s orders, I try to take Viagra about three times a week, without regard to intercourse, just to stimulate blood flow. Using a vacuum device and Viagra, I get something approaching a 30% to 40% hard erection, but it is still insufficient for intercourse.

I have tried injection therapy (Edex, 10 mcg), and it produces an erection suitable to intercourse, but it’s a small ordeal to have sex this way, as I’m sure you’ve heard from many men who try injection therapy.

At the time of the surgery, I thought I had a good chance of regaining erectile function, at least by now. My urologist says that sometimes erectile function might take as long as two years to
be restored or, possibly, won’t be able to be restored at all. I wonder if it would be worthwhile to schedule a trip to Johns Hopkins for a consultation—or whether I’m doing everything I should and just need be patient for the erections to return. Thanks for any advice you can share. **Via e-mail**

**A.** Many patients we see who have tried Viagra without much success are unaware that there are very specific ways to use the medication in order to achieve an optimal result. Specifically, Viagra needs to be taken on an empty stomach. It takes about an hour for the Viagra levels in the blood to reach a sufficient therapeutic level. Viagra will remain in the bloodstream for three to four hours, during which time it is most likely to have its effect on sexual function. It is also important to remember that some kind of physical stimulation is required to make Viagra effective; the drug alone will not produce spontaneous erections.

Summing up, be sure to follow these three rules:

1. Take the pill one hour in advance.
2. Take the pill on an empty stomach.
3. Use physical stimulation.

You should know, however, that men who undergo radical prostatectomy at an age of declining sexual function are less likely to regain complete sexual function afterwards. Other disease conditions such as diabetes and hypertension may also reduce the likelihood of a return of erections.

The International Index of Erectile Function (IIEF) is a standardized questionnaire that helps you and your doctor determine the likelihood of return of sexual function. In general, the higher your score on this questionnaire, the more likely your sexual function will return.

Your letter describes most of the techniques currently in place for sexual function restoration. Sometimes, these are not enough. For a man who is young enough and has a strong enough sexual drive, an implantable prosthesis is a good solution to the problem. It requires an expert urologist to implant one, but the outcome with this device is usually excellent, and it would eliminate your reliance on the medications, injections, and external devices you’ve been struggling with. In your case, it might be worth considering.

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*When taking Viagra, be sure to follow these three rules: (1) Take the pill one hour in advance; (2) take the pill on an empty stomach; and (3) use physical stimulation—the drug alone will not produce spontaneous erections.*
Ejaculate Discoloration

Q. I had a biopsy last week and my ejaculate has been pinkish. If this discoloration is caused by an infection, should I be taking an antibiotic? Oskaloosa, IA

A. The discoloration is most likely due to blood in the ejaculate from the prostate or the seminal vesicles. It can continue for up to two months. In the absence of other symptoms, it is generally harmless.

When To Start Injectable ED Medication

Q. I have an appointment with my urologist scheduled for next month. I had a robot-assisted radical prostatectomy almost nine months ago, and my erections are now very weak. At this appointment, I am going to ask about using penile injections for sexual activity. My doctor originally said that he would like me to wait until a year after the surgery, but I can’t wait any longer.

I have tried the three drugs (Viagra, Cialis, and Levitra) and had no success whatsoever but did experience the side effects, which included a stuffy nose and sore back. I tried the vacuum pump, but it just seems so mechanical.

You should know that before surgery, I had no problem getting a hard erection and never had to use erectile dysfunction (ED) medication.

I am 53. My wife is 42, and she thinks sex is the best thing since sliced bread. It’s time to get going, she keeps reminding me. From what you know of the injectable drugs, is there any reason for waiting for a year following prostate surgery before using an injectable? Any help with this will be greatly appreciated. Shaker Heights, OH

A. Erections can improve for up to three years after radical prostatectomy. If your response to ED medication is weak now, it may improve over time, especially as you are relatively young. However, there is no reason to defer injection therapy at this time. There is little evidence that it will hurt your natural erections or the likelihood of future recovery.

Erection Failure

Q. One of the major reasons I decided to have surgery for my prostate cancer was that I thought I would be able to maintain my erections after my prostate was removed. I am 72 years old, and I went to a highly recommended hospital for the prostatectomy. The top surgeon performed the operation, sparing both erection nerve bundles.

At my prostate cancer support group meetings, I am glad to hear that many of the men are experiencing erections after having a radical prostatectomy. As for me, it has been eight
months and I still have not had a suitable erection.

I tried 100 mg of Viagra and expected results within 45 minutes of taking it. However, except for some nasal stuffiness, nothing happened the three times I used the drug. Recently, I have been using a vacuum pump, and although I do get an erection, I have some urinary leakage, which is an effective mood killer. Any thoughts on my chances for improvement, or is this just the way things are going to be? Tampa, FL

A. It’s unusual for a man over the age of 70 to undergo radical prostatectomy these days, but in selected cases, it is a reasonable choice. The majority of men in this age group, however, will take so long to recover their erections that it’s only fair to tell them that recovery of erections is unlikely, despite perfect nerve bundle preservation. This is what I tell my patients in an effort to be perfectly honest. Fortunately, most men can still maintain good urinary control.

The fact that you get nasal stuffiness from Viagra means you are getting adequate blood levels of the drug, so the problem must be an inadequate response of your erectile tissues. Viagra works by amplifying the natural erection response, but if there is insufficient natural response to begin with, there is nothing for the Viagra to act on and improve.

A vacuum erection device is one way to help, but if you’re seeking a treatment with a greater likelihood of success, it’s most reasonable to move right to injection therapy.

All that said, you might want to give your body another chance to respond to Viagra after more time has passed. It is possible that your response may improve.

“Bent” Penis

Q. It’s a bit embarrassing to discuss with anyone, so I will use this anonymous posting and ask what can be done for a “bent” penis. Eight months to the day after my radical prostatectomy, which was also my 18th wedding anniversary, my wife and I celebrated with a wild night on the town, and an even wilder night when we got home, thanks to a Cialis pill. A month later, I noticed that my penis had taken a decided left turn when it was flaccid, and this was even more evident when I had an erection, again with the help of Cialis. The slight bend doesn’t bother me. Sure, it looks different, but otherwise it’s OK. Nonetheless, I have three questions: (1) What caused my penis to bend at this point in my life? (2) Will the bend worsen? (3) Do you think I should I be concerned? Royal Oak, MI

A. Peyronie’s disease is the name given to a condition of penile curvature on erection. Exact causes of this condition are not known, but injury or inadequate blood supply to the erectile tissues in the corpora cavernosa are thought to contribute. In the earliest stages, the curvature may be painful on erection, due to stretching and inflammation. At this stage, attempts at medical therapy have been offered, but little is known about their real efficacy.
Vitamin E and potaba (aminobenzoate potassium) are the standard recommendations. (Potaba treats fibrosis, a condition in which the skin and underlying tissues tighten and become less flexible. This condition occurs not only in Peyronie’s but also in such diseases as dermatomyositis, morphea, and scleroderma.)

Peyronie’s is thought to clear or reverse spontaneously in up to 50% of patients. Surgical treatment is reserved for men in whom the condition is long lasting and interferes with sexual function by limiting vaginal penetration. The simplest method is to “reef in” the side opposite the curvature to bring the penis into line (called the Nesbitt plication.)

If the Peyronie’s scarring goes deeper into the corpora cavernosa, excision with grafting or a prosthesis may be required to solve the problem. Assessment and management of this kind of erectile dysfunction require an expert urologist who specializes in sexual dysfunction.

**Peyronie’s Following a Biopsy**

**Q.** I developed Peyronie’s disease shortly after having a prostate biopsy. My urologist assured me that the Peyronie’s was not related to the biopsy, but I find it a disturbing coincidence. In the meantime, my biopsy was positive for prostate cancer. I have a Gleason 6 (3 + 3) and a PSA of 6.1 ng/ml. My surgery is scheduled for next month.

My question has to do with penile shrinkage and Peyronie’s. I have read that the penis can shrink as much as an inch or more in length after prostate surgery. If, in fact, my penis does shrink, could that worsen the downward bend I now have from my Peyronie’s? Even if my penis does not shrink, will my Peyronie’s worsen?

I’d appreciate your help with these anxiety-provoking issues. **Bloomfield, CT**

**A.** The Peyronie’s is probably not related to the biopsy, but it can certainly get worse after a radical prostatectomy. In studies of men undergoing treatment for erectile dysfunction after radical prostatectomies, it has been reported that up to 50% of patients undergoing penile biopsies have had signs of scarring in the corpora cavernosa—a finding typical of more advanced Peyronie’s disease. Whether the same mechanism is responsible for Peyronie’s contracture after prostatectomy, or the kind that occurs spontaneously, is not known.

Inadequate blood supply to the erectile tissues is thought to be at least partially responsible for the condition. There is most likely decreased blood supply to these tissues for a period immediately after the surgery, and that could, in theory, worsen any existing Peyronie’s disease.

It would seem reasonable to try to get the blood supply back to normal soon after the surgery, and there have indeed been attempts to treat men with Viagra and similar drugs shortly after surgery, but the data do not suggest a significant improvement.
I have advised patients to consider early injection therapy as a means of maintaining arterial blood flow to the erectile tissues shortly after surgery, but there are no data on the effectiveness of this approach. Serious Peyronie’s disease requires an expert urologist for management and may require further surgery to deal with the deformity.

Return of Erections After Prostate Surgery

Q. I was diagnosed with prostate cancer last month, two weeks after my 60th birthday. My wife and I have always had an active sex life. Our concern is not so much about the cancer—my PSA is 4.2 ng/ml, Gleason 6, and I have access to the best prostate surgeon in the country. Our worry is that the surgery will greatly diminish our sex life. When can I expect that my erections will return to “normal” after surgery? Baltimore, MD

A. It may take up to three years to obtain a full recovery of erectile function after surgery, although signs of enlargement and response to arousal can be seen as early as three to four months post-surgery in men your age. Men with good sexual function before surgery (IIEF questionnaire scores of 22 out of 25) can be expected to recover erections in the majority of cases, although reports and details vary from center to center. It’s important to note that the ability to climax is not related to the presence of erection and can come back very early after surgery.

Sex and Radiation

Q. My husband, Charlie, learned five months ago that he has prostate cancer, and since the day we found out, I’ve been the one doing the research. His urologist wants him to have a radical prostatectomy. I investigated brachytherapy and felt that was the way to go.

Charlie had triple bypass surgery five years ago and did not handle the surgery well. He doesn’t work full time now, and I am afraid that the side effects of the surgery will do more damage to his self-esteem.

We were both thinking that radiation would be the best choice—until the urologist called to tell us that my husband might lose the ability to have an erection in a few years due to the late-stage scarring that will take place. We are now totally confused and don’t know what to do. Would you please help direct us? Knoxville, TN

A. Radiation therapy can certainly lead to a loss of potency, but so can age and the kind of chronic small vessel disease associated with coronary artery disease leading to bypass surgery. If your husband has enough “significant” prostate cancer to warrant treatment, and he has had a difficult time with surgery before, you may be right in considering a more conservative approach.

External beam radiotherapy is a very safe and conservative approach. As with any approach
to treatment of prostate cancer, the first consideration is whether to treat it at all, and after that, treatment should be undertaken with three distinct priorities in mind: cure the cancer, preserve urinary function, and preserve sexual function, in that order.

As with any approach to treatment of prostate cancer, the first consideration is whether to treat it at all, and after that, treatment should be undertaken with three distinct priorities in mind: cure the cancer, preserve urinary function, and preserve sexual function, in that order.

If your husband is young enough and generally well enough following his previous surgery, he would be a good candidate for nerve-sparing radical prostatectomy, but without a personal consultation with a skilled urologist, this decision can be hard to make on one’s own. I recommend you get a second opinion in person.

Penile Shrinkage

Q. I am 61 and had a radical prostatectomy several years ago. At the time, my erection was seven inches and hard. Since the time of my surgery, which has been successful in keeping me cancer-free to date, my erection has lost an inch in size and some of its overall hardness. Could something have happened during the surgery, perhaps some kind of damage to nerves or blood vessels, which would explain this? Charlottesville, VA

A. Two recent studies have confirmed the observation that penile shortening can occur in some men after radical prostatectomy. Drs. Kim and Soloway at the University of Miami found that 19% of a group of previously normal men had at least a 15% shrinkage in penile length, a finding that was unrelated to whether nerve-sparing surgery had been performed.

A second recent study by Drs. Munding, Wessells, and Dalkin at the University of Arizona found some change in penile length in 71% of a group of patients after radical prostatectomy. In seven cases, the changes were small: only 0.5 cm. Eleven were shorter by 1.0 to 2.0 cm, and four were shortened more than 2.0 cm. (One inch is approximately 2.5 cm.)

A study of erectile tissue biopsies from the penises of men undergoing radical prostatectomy by Drs. Iacono, Giannella, and others at the University of Naples in Italy showed a loss of muscle tissue and an increase in scar. Drs. Ciancio and Kim at the Baylor College of Medicine in Houston also found scar deformity (some forms are called Peyronie’s disease) in 41% of patients with erectile dysfunction after a radical prostatectomy. Over
time, 40% improved, half were unchanged, and 10% got worse.

Therefore, the answer to your question is that penile shortening and scarring can occur after radical prostatectomy in some men and can also be associated with inadequate recovery of erections. The cause of the problem is not known. It may include inadequate arterial perfusion of the penis in the period shortly after the surgery, damage to arterial supply or venous drainage of the penis during the surgery, or the wound healing process. This is an area requiring further investigation.

**Priapism: Protracted Erections**

**Q.** I have erectile dysfunction that was caused by my prostate cancer surgery last year. In an effort to achieve a hard erection, I agreed to try Caverject, an injectable erection-producing drug that was recommended by my urologist. My doctor injected me in his office with a 30% solution in a 0.85-cm syringe. I certainly got an erection. But by the time I got home a half hour later, my penis was swollen much more than expected, red, and painful. Shortly thereafter, pain started to develop in my penis and spread to my rectum and the backs of my legs.

The erection began to subside after 90 minutes (on my doctor’s instructions, I’d taken some Sudafed), and the pain level decreased substantially. Needless to say, I am extremely reluctant to try that drug again. My doctor is not sure why I had such a poor reaction. Was I overmedicated, or could this be just a first time reaction to the drug? Should I give Caverject another try? **Riverdale, NY**

**A.** Priapism, the condition of prolonged painful erection of the two corpora cavernosa without engorgement of the bulbospongiosus (the head of the penis) is considered a urological emergency. It usually occurs because of preexisting disease, such as sickle cell anemia or certain lymphomas or leukemias, or because of a supersensitivity of the erectile tissues due to spinal cord injury or certain neurological diseases (e.g., multiple sclerosis). Priapism can be caused by an increase in oxygen-rich (arterial) blood flow to the penis, or a sludging and clotting of oxygen-poor blood (venous stasis) in these same areas.

Prolonged priapism can lead to permanent damage of the erectile tissues. In your case, unless there is a predisposing reason for supersensitivity from neurological disease, you may have received too high a dose of medication or simply been too sensitive to it. An alpha-agonist medication (such as the over-the-counter allergy medication Sudafed your doctor recommended) may help to shrink the blood sinuses in the penile tissues, but sometimes it is necessary to inject this medication into the penis or to evacuate the blood by syringe aspiration. This needs to be done by a urological expert.

Pharmacological treatment for erectile dysfunction is usually safe and effective. A uro-
logical expert who specializes in this must establish the initial dose. As in your case, this is done in an office setting, where the erection should be observed and provisions made for emergency treatment of priapism complications, should they occur. Once the dose is established, the prescription can be filled and used on a regular basis with safety.

Chances are that you will be able to use the technique with a reduced dose. I do recommend trying again, starting low and building up gradually.

**Pain at Orgasm**

**Q.** For the first time following my radical prostatectomy, I am beginning to experience pain upon orgasm. The pain has been coming from the area of my pelvic floor muscles. I’m worried because I had my surgery six months ago, and this seems like a setback. What causes the pain, and what can I do to relieve it? **Laurel, MD**

**A.** A number of patients have reported similar symptoms after radical prostatectomy. In most men, the pain is transient. In many, it responds to non-steroidal anti-inflammatory drugs like ibuprofen. We don’t know why this pain occurs but suspect it has to do with some scarring within the pelvic muscles after the operation. These muscles contract during climax, pulling on the scarred muscle.

Like so many subtle aspects of outcomes after surgery, our knowledge is not perfect. We depend on patients like yourself to tell us in detail about your experiences. Then, when we have accumulated a certain amount of information from patients, we try to find patterns and make sense of them.

**Sex and Prostate Cancer Risk**

**Q.** I’ve been told that if a man has sex and orgasms often, this will “massage” the prostate, preventing prostate cancer in the process. Myth or fact? **St. Louis, MO**

**A.** Myth. There is absolutely no evidence that an increased frequency of sexual activity will reduce the risk of prostate cancer. In fact, the risk of cancer is similar among men who are celibate and those who are not.

**Bicycle Riding and Erectile Dysfunction**

**Q.** I have heard that riding a bike can lead to erectile dysfunction. I’ve had an orchiectomy (removal of the testicles), so that isn’t a concern for me. However, I am a daily cyclist (25 miles), and I’m concerned that it could have possible bad effects on my cancer. I hope this isn’t true because I find that the exercise keeps me in a mellow mood for the entire day. **Santa Barbara, CA**
A. There is no evidence that biking or any other type of exercise adversely influences cancer. In fact, there is some evidence that exercise provides beneficial effects in those with cancer. However, it is possible to injure the pelvic vessels supplying blood to the penis with compression in the perineum (between the scrotum and rectum) and adversely affect erectile function.

Penile Injections and Scarring

Q. Three years ago, at age 67, I had a radical prostatectomy. I’m having very good success with the use of the Caverject injections. I’m getting a little concerned, however, because my erect penis is now shaped more like an upward banana rather than a straight appendage, as it was prior to surgery. My urologist says it’s OK, and he doesn’t think I have any scar tissue. What do you recommend that I do? Yes, I’ve considered going to a new doctor. Hyannis, MA

A. Scarring from injections could cause curvature of the penis in the same way that a Peyronie’s plaque can cause curvature. In fact, scarring from penile injection therapy is a complication that occurs in about 1% to 10% of patients. However, many experts, like your doctor, believe that curvature occurring in a man being treated with penile injection is not the result of scarring from injection therapy but rather that it’s due to the coincidental development of a Peyronie’s plaque.

If curvature makes intercourse too difficult or causes pain in either you or your partner, then penile injection should be discontinued. You may want to try lubrication to assist with intercourse. Also, consult your doctor to ensure that the injections are being administered properly.

The “Forgotten Wife”

Q. I am a “forgotten wife.” My husband had a radical prostatectomy in February, and soon after that our sex life disintegrated. My husband lost his erection, although with my help, he is able to achieve an orgasm. I do my best to satisfy my husband sexually and, in return, he gives me a back rub. He makes no effort to satisfy me sexually; I have to do that myself.

We met with a urologist to discuss my husband’s sexual dysfunction and the doctor suggested that I send away for some videotapes to reeducate my husband about various other ways of giving me sexual pleasure. My husband is nice to me. He kisses me goodnight, but that’s about it. I’m 67 years old but look and feel 50. I’m extremely frustrated and would like to have my sex life back. What should my next step be? Rockville, MD

A. Couples who are struggling with the issues you describe should consider meet-
ing with a counselor who is trained to help couples deal with sexual dysfunction. With counseling, many couples regain the intimacy that was present prior to surgery.

**Considering a Penile Implant**

**Q.** I am 70 years old and had a radical prostatectomy a year ago. The cancer cells seem to have been contained within the prostate. I have been using a manual vacuum pump to aid in erections for intercourse, and I’m satisfied with the penile rigidity. However, the constriction band that I have to put at the base of my penis is bothersome.

I am now thinking of having a penile implant. I have heard so many wonderful things about implants but feel I need to know more about any undesirable aspects of this device and the surgical procedure. **Fort Worth, TX**

**A.** A more natural erection occurs after placement of the inflatable penile prosthesis, which allows the penis to remain flaccid when not required for sexual activity. Semi-rigid prostheses leave the penis in an erect state at all times. Complications of penile prosthetic surgery can include infection, scarring, and mechanical failure of the device. The surgical procedure causes some pain that almost always resolves soon after surgery. Most men are satisfied with inflatable penile prostheses after placement.

**BPH and Erections Problems**

**Q.** I’m 78 years old and have some questions regarding sex. Is my declining ability to achieve an erection and the lowering of penile sensitivity during intercourse associated with my BPH? Or are these problems caused by the medication (Flomax) I take for BPH? Can these effects be reversed? **El Sobrante, CA**

**A.** Erectile dysfunction that occurs with age—when not due to medications—is usually due to problems with blood flow or blood being trapped in the penis. Antihypertensives (blood pressure medications) are commonly used drugs that cause erectile dysfunction. Prostate enlargement in itself does not cause erectile dysfunction, and Flomax is not known to cause erectile dysfunction but can cause abnormal ejaculation. Erectile dysfunction can be treated, and men with this problem should consult a urologist to discuss management options.

**Libido and Prostate Cancer**

**Q.** I’m 64, in good health, with a PSA of 1.5 ng/ml, and a very high sex drive. My father died at the age of 84 from prostate cancer, shortly after the doctors found that it had already advanced to his bones. My question has to do with the relation between a high sex drive and the development of prostate cancer. Is there any research showing that a high sex drive is somehow linked with prostate cancer? **Auburn, AL**
A. There is no evidence that I am aware of linking sex drive and the chances of getting prostate cancer. Libido is probably related to many factors and not just androgens or male hormones, so a simple direct relationship between libido and prostate cancer probably does not exist.

**Restoration of Sex Life Following Brachytherapy**

Q. Is there any hope for a sex life for me? I’m 72 years old and first underwent radiation therapy for my prostate cancer three years ago, followed by seed therapy. My PSA was very low but, when it began to rise, I was started on hormones, which dropped it to below 1.0 ng/ml.

I have a bad heart and can’t take Viagra because of this condition. I have no erections, no sex, no nothing. I have to urinate five times a night. What can I do to help get my sex life back to where I was prior to my cancer? **Carmel, CA**

A. There are options other than Viagra for management of erectile dysfunction. For men who have a tenuous cardiac status, perhaps the safest option would be the vacuum erection device (VED)—a tubular device that fits over the penis and draws blood using negative pressure (vacuum). A band placed at the base of the penis keeps the blood in the organ for a lasting erection. (See page 19 for more information on the VED.)

**Erections With Bowel Movements**

Q. I had a nerve-sparing radical prostatectomy a few years ago and have had erectile dysfunction ever since. I have had some success with Viagra in that my erections are now, as my wife calls them, “stuffable.” Injection therapy has not been very satisfactory, nor has the vacuum device that I recently tried.

Oddly, for a few months now, I have been experiencing a firm erection while straining to have a bowel movement. The harder I strain, the harder the erection becomes. To tell you the truth, these erections are the closest to my pre-prostate surgery erections. The problem is that the erections subside immediately after I’m finished at the toilet. Can you please explain what is going on here? **Pittsburgh, PA**

A. Some men describe this phenomenon after radical prostatectomy despite a lack of adequate erections at the time of attempted intercourse. It is believed by some experts to be a sign of nerve damage. Distension of the rectum causes pressure stimulation of remaining nerve tissue that results in an erection.

**Loss of Penile Length**

Q. After a recent radical prostatectomy, I’m sure I’ve lost at least one inch of penile
length. Evidently, the surgical procedure of excising the prostate and reattaching the urethra to the bladder caused the shortening. Are you aware of anyone who has been able to regain the loss? My vacuum erection device has been totally ineffectual, and the sham ads for “male enlargement” offer little encouragement. **New Vernon, NJ**

**A.** Several studies have suggested a loss of penile length in men undergoing radical prostatectomy. The only men I have heard complain of a loss of penile length are men who fail to recover erectile function. I believe that the lack of blood flow to the corporal tissues of the penis in men who do not regain erectile function after surgery—not physical shortening of the penis from the surgery itself—causes the loss of penile length.

**Penile Implant Advice**

**Q.** I am 66 years old and had a radical prostatectomy and orchiectomy almost five years ago. Before my surgery, I had a very active sex life. Since then, I have tried everything on the market for erectile dysfunction, and nothing has worked especially well. Is there any hope of recovering this very important part of my marriage? My wife and I have talked to my oncologist about a penile implant. Any advice you could give us would be very much appreciated. **Burlington, VT**

**A.** Men who have penile implants are generally very satisfied with the results. However, with today’s improved techniques in oral medication, urethral suppositories, vacuum erection devices, and injectable medication, many men find simpler solutions.

At 66, you should be honest with yourself about your level of sexual desire and frequency of sexual activity. If a careful discussion suggests you would be happy with an implant, and you have already considered and rejected injection therapy, then you should proceed with finding a urologist who is expert in performing the surgery.

As you get older and your sex drive diminishes, the implant can always be removed. It’s important to understand, though, that the natural erectile tissue that might respond to injection and oral medication will have been destroyed in the placement of the implant, so once an implant is inserted, nothing else will ever produce an erection.

**Penile Pain**

**Q.** I am 44 and had a radical prostatectomy this year. I am doing very well five months after the procedure. I have no incontinence issues unless I drink too many beers. I’ve been able to resume my five-mile daily runs and weight lifting, just like before surgery. For that, I’m happy.

My erections have not returned to pre-op status, however. I started taking Viagra (100 mg) and had some penile hardness, but I would feel a strange pain in my shaft and was
not able to get fully erect. Finally, after about a week of taking Viagra, I was able to have sex in which I could penetrate my wife. However, after several thrusts, I developed such a pain in my shaft that I had to withdraw. That was the end of sex for the night.

I have never felt such pain before, and I’m wondering if it had something to do with my surgery and the nerves that cause erections. I still have pain with my erections. Any ideas as to what I can do, or some hopeful suggestions for the future? Barnstable, MA

A. The nerves (neurovascular bundles) that allow men to have erections are not involved in pain signals. Pain in the shaft of the penis at the time of intercourse can be caused by injury with extreme bending. Also, after radical prostatectomy, pain signals from the perineal area, where the operation took place, could be felt as penile pain. This should disappear with time.

Casodex and Sex Life

Q. I’m 54-years old and have been “watching and waiting” for two years because I was too overweight for a radical prostatectomy. When my PSA reached 14 ng/ml, my doctor prescribed Casodex for three months, followed by 35 highly-focused radiation treatments over six weeks, followed by three more months of Casodex therapy.

Five weeks after stopping Casodex, my breasts are still enlarged. I can now get an erection but not always and, when I do, it’s not as firm as it was prior to hormonal treatment. How long does it take for the side effects of the Casodex to subside, and do they disappear completely? Grand Rapids, MI

A. Breast enlargement and tenderness can occur with Casodex but usually resolves within a year after cessation of the medication. In men who have both hormonal therapy and radiation therapy, the side effect of erectile dysfunction may be due to either treatment. Viagra has been helpful after radiotherapy in improving erectile function.

Proscar, Avodart, and Prostate Cancer

Q. I was surprised to read the recent research that linked taking Proscar with more aggressive prostate cancer. I was also worried because I had just been prescribed the drug for my BPH. Can I avoid the possibility of cancer by switching to the newer drug Avodart? Norfolk, VA

A. If there is a relationship between Proscar and aggressive prostate cancer, switching to Avodart will not reduce the risk because Proscar and Avodart have the same mechanism of action inside the prostate. However, the Prostate Cancer Prevention Trial (PCPT) that suggested a possible relationship between Proscar and aggressive disease did not definitively prove this relationship.
**TURP and Return of Erections**

**Q.** I am 57 years old and recently had a TURP procedure performed. I had had long-standing problems with blockage and hesitancy. The procedure seems to have relieved my urination problems but I am in some discomfort, still. My penis is very tender and sore, and it hurts when I sit down.

To make matters worse, I can no longer keep a hard erection, which has effectively killed my sex life. I had no problems prior to the surgery, as my wife will attest. Is there something going on that my urologist may not have checked for? Will my erections return? **Georgetown, SC**

**A.** After a TURP, it is not unusual to have some soreness in the perineum made worse with sitting, and burning with urination from post-surgical inflammation. This discomfort alone can result in erectile dysfunction. However, long-standing erectile dysfunction from cavernous nerve injury would be an unusual side effect in a young man such as yourself after a TURP by an experienced doctor. I would expect most men who had no erectile dysfunction before TURP to have a return of erectile function within three months after a TURP.

**Headaches and ED Drugs**

**Q.** I am 68 and had prostate surgery several years ago. My recovery progressed well. The incontinence cleared up within three weeks, and I can now wear underwear without fear of embarrassing myself with leaks. However, my erections did not come back to their pre-surgical hardness.

My urologist recommended Viagra, which I took several times, but the headaches I got at the 100-mg dose were just too much to bear. I tried the injectable medication and although the erections were strong, the whole “get out of bed, go to the bathroom, and shoot up” routine was just too much.

Now that there are two other drugs on the market for ED, I am thinking of trying the drug route again. I only hesitate because of the fear of possible headaches. Is either Levitra or Cialis supposed to cause headaches? **Ankeny, IA**

**A.** Viagra, Levitra, and Cialis can all cause headaches as a side effect, but some men will have fewer side effects from one medication compared to another. Most men, following surgical treatment of prostate cancer, do not have a return of erections that are exactly like the erections prior to surgery, but most men will adapt to the situation and finally get to the point where the changes in erectile function are only a small bother, if any.
Loss of Ejaculation Ability

Q. I am 63 and will be having a radical prostatectomy performed in three weeks. My PSA is 6.2 ng/ml and my Gleason score is 7. While the reality of cancer has sobered me considerably, the idea of losing my ability to ejaculate has seriously depressed me. I do not know how I can get over losing this aspect of my life, something that made sex so much fun. Any ideas? New Brunswick, NJ

A. After radical prostatectomy, men can still, with stimulation of the genitalia, have an orgasm—the pleasurable sensation that was associated with ejaculation prior to surgery and that is caused by contraction of pelvic floor muscles. After radical prostatectomy that removes the prostate and seminal vesicles (the organs that produce seminal fluid), the orgasm will be dry, but the pleasurable sensation of orgasm remains.

Ejaculation Frequency and Prostate Cancer Risk

Q. At a recent meeting of my prostate cancer support group, a fellow member announced that there was medical evidence linking prostate cancer to infrequent ejaculations. Is this an urban myth or not? I had a very active sex life and still developed cancer at age 55. Greensboro, NC

A. There is no evidence that the frequency of ejaculations is related to the development of prostate cancer. A recently published study looked at ejaculation frequency among men throughout life and did not find a relationship between the development of prostate cancer and ejaculation frequency for most men. However, for those men with the highest ejaculation frequency, there was a slightly lower risk of disease.

Post-Op Complication: Urine After Ejaculation

Q. I am 45 years old and was diagnosed with prostate cancer with a Gleason 7 and PSA of 6.1 ng/ml. It is now seven weeks after my radical prostatectomy. Unfortunately, the doctor was not able to spare my erectogenic nerves. Still, my wife and I are very pleased to discover that I can achieve orgasm without an erection, although at times I seem to ejaculate some urine. Is this very common? When will it stop? Orlando, FL

A. It is very common for men to have some leakage of urine with orgasm after radical prostatectomy, even when they are perfectly continent otherwise. In my experience, this improves during the first year after surgery.
Presenting the Johns Hopkins Prostate Library

From the experts at the James Buchanan Brady Urological Institute, ranked America’s #1 Urological Center for the 19th year in a row by the U.S. News & World Report

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This all-in-one comprehensive guide explains everything you need to know about your prostate – what it is, what it does, and what problems can develop, such as prostatitis, benign prostatic hyperplasia (BPH or enlarged prostate), and prostate cancer. You’ll learn key facts about prostate health, discover prostate treatments you never knew existed, and understand what your options are if you’re ever diagnosed with prostate cancer. 96 pages.

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The Johns Hopkins Prostate Bulletin is an indispensable quarterly journal for men with prostate cancer, and the other prostate health concerns: Benign Prostatic Hyperplasia (BPH), prostatodynia, and the various forms of prostatitis. It also deals with side effects and related conditions, such as Lower Urinary Tract Symptoms (LUTS), overactive bladder (OA), and erectile dysfunction (ED).

Written by Dr. Jacek L. Mostwin and his esteemed colleagues at the world-renowned James Buchanan Brady Urological Institute, The Johns Hopkins Prostate Bulletin goes beyond the basics to report on the latest therapeutic treatments, advanced news of clinical trials, in-depth reports, new medications, plus detailed answers to subscribers’ concerns about all aspects of your prostate health.

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