Sexual Dysfunction and Erectile Dysfunction After Prostate Cancer Treatment

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William Du Comb
Men's Sexual health and Reconstruction
Lahey Hospital and Medical Center

Beth Israel Lahey Health

William Du Comb, DO

- **Lahey Hospital & Medical Center Urology**
- 41 Mall Road
- Burlington, MA 01805
- 781-744-8420

Education:

- Medical School: Michigan State University
- Residency: Detroit Medical Center
- Fellowship: Johns Hopkins in Sexual Medicine and Reconstruction

Specializes in:

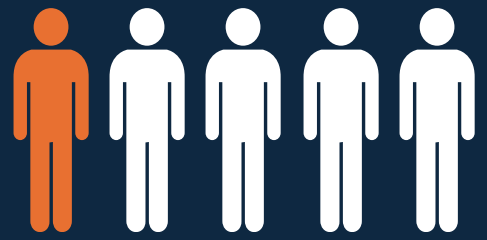
- Ejaculatory Dysfunction
- Erectile Dysfunction
- Peyronie's Disease
- Low Testosterone

Objectives

- Discuss erectile dysfunction and explain the impact of prostate cancer treatment on erectile function.
- Discuss medical and surgical options for managing erectile dysfunction.
- Discuss the impact prostate cancer treatment has on testosterone and hypogonadism.
- Discuss the changing landscape of testosterone replacement therapy in patients with a history of prostate cancer.

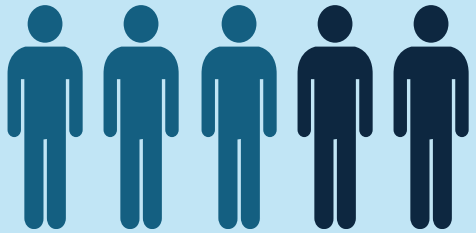
Erectile dysfunction (ED)

- ED is defined as the persistent inability to achieve or maintain an erection that is firm enough to perform sexual intercourse.[1] **How common is it (U.S. men)?**



~1 in 5 men

aged 20 and older suffers from some degree of ED.[2]



It's estimated that more than

half of men

over the age of 40 have some degree of ED.[3]

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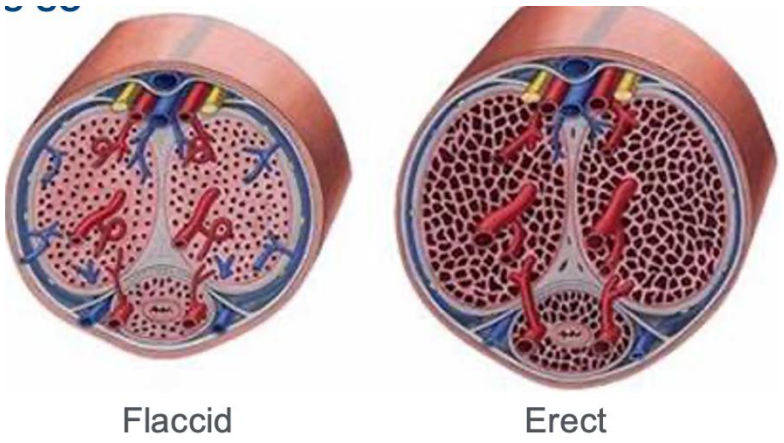
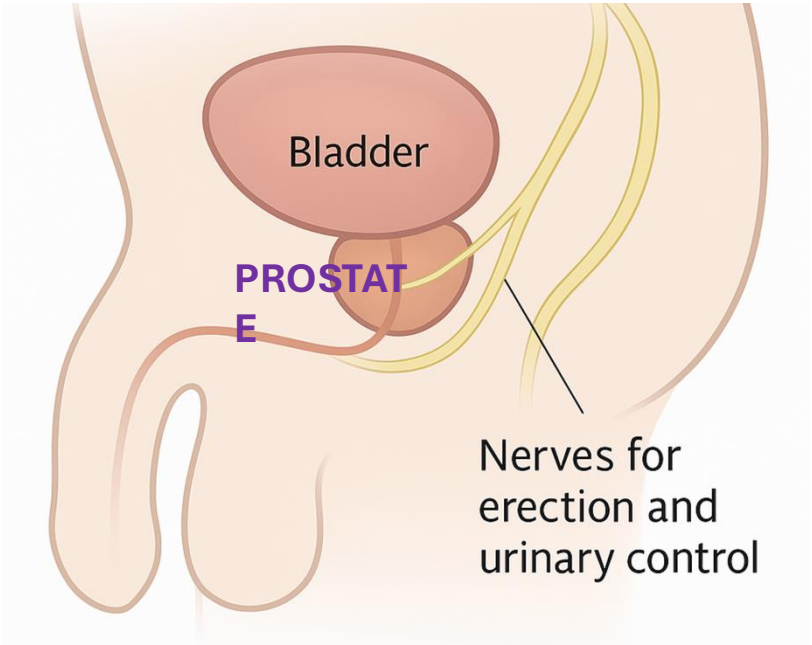
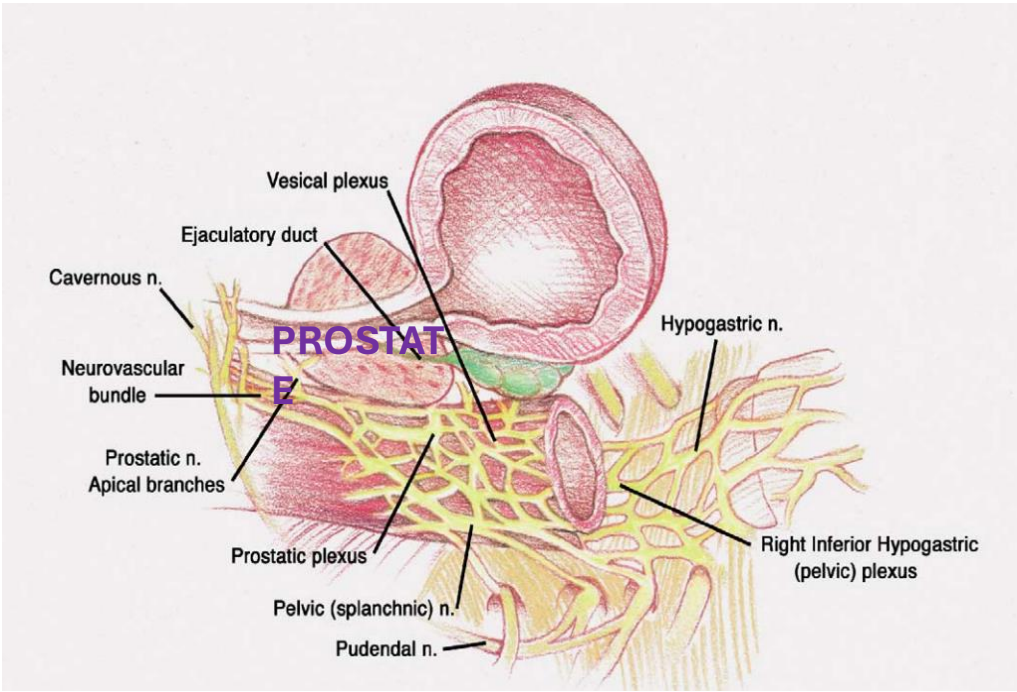
Physiology of Erections

- With arousal, the nerves around the penis become activated
- Muscles relax and blood flows into the penis
- The additional blood causes the penis to stiffen
- The erection compresses the veins so the blood can't leave the penis, enabling the penis to remain erect



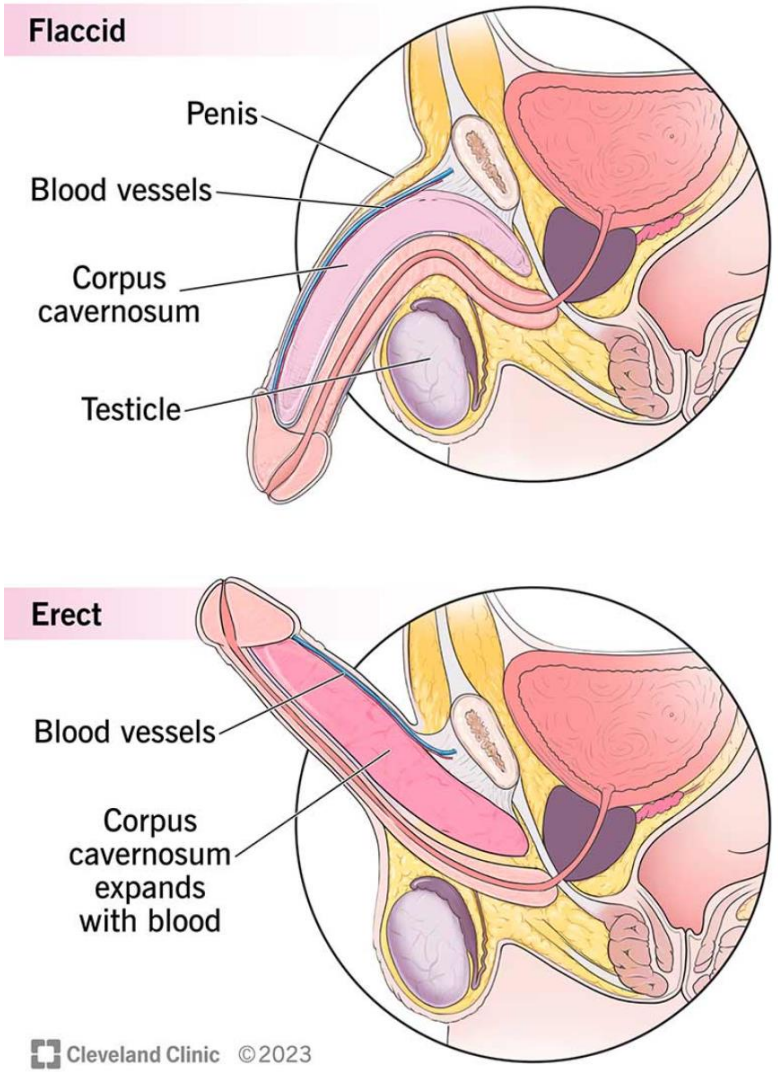
Anatomy of Prostate Cancer Treatment





Tewari et al., European Urology 2003

Pathophysiology of Erectile Dysfunction



Cavernosal nerve injury

↓

Loss of erections

↓

Cavernosal hypoxia ← **Arterial injury**

↓

Smooth muscle apoptosis > Collagen accumulation > **<u>fibrosis</u>**

→ Veno-occlusive dysfunction

→ Cavernosal hypoxia

Hyun, JS, World J Mens Health 2012

https://my.clevelandclinic.org/health/diseases/10035-erectile-dysfunction

Erectile Dysfunction After Prostate Cancer Treatment

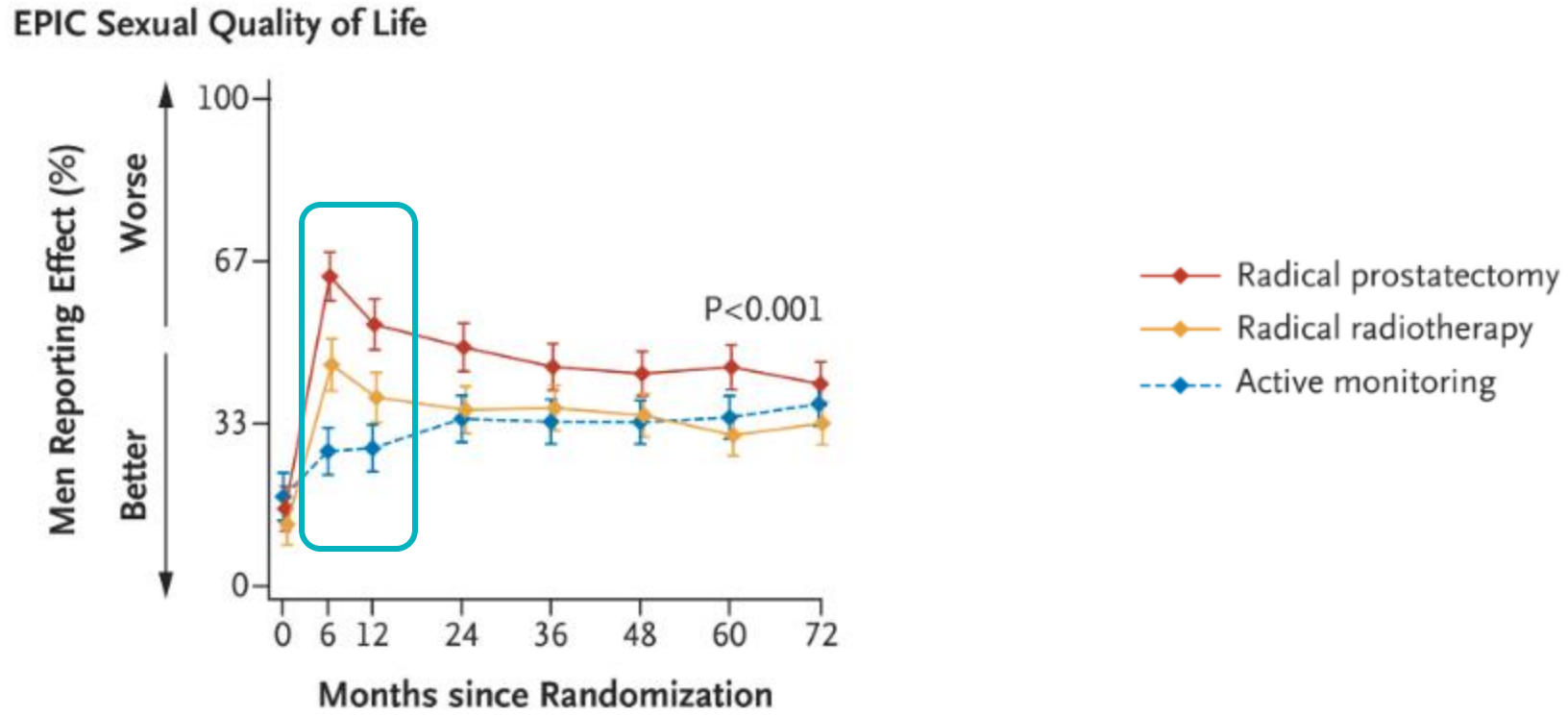
- **Erectile dysfunction (ED) after prostate surgery – 10-100%, after RT 40-60%**
  - ED definition varies in studies: "no erections" at all – "90% erection"
  - Use of robotic and laparoscopic surgery, nerve sparing techniques have improved outcomes
- **Factors that matter:**
  - Pre-op: Age, medical problems, smoking, baseline erectile function
  - Intra-op: Nerve sparing (cancer stage/grade), number/type of treatments, surgeon experience
  - Post-op: Physical activity
- Recovery can take up to 24 months post treatment
  - May not return to pre-treatment levels
  - ~5% of patients may need surgical management after prostatectomy, 0.3% after RT

Penile Length Loss following Prostate Cancer Treatment

- **Penile Length Loss After Treatment**
  - Radical Prostatectomy (Surgery):
    - Average reduction: 0.5-4.0 cm
    - Approximately 68-71% of men experience shortening
  - Radiation Therapy:
    - Shortening is less common
    - 2.67% of men report penile shortening

Quality of Life after Prostate Cancer

- Sexual dysfunction can affect quality of life for months post treatment

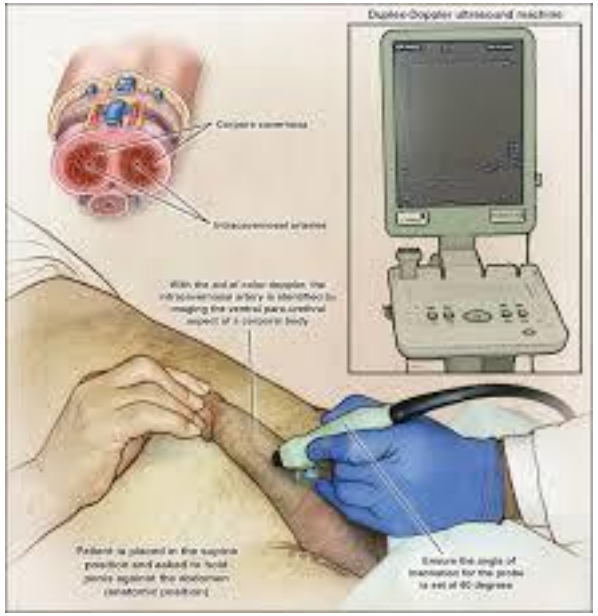


Donovan et al.; NEJM 2016

Penile Doppler US

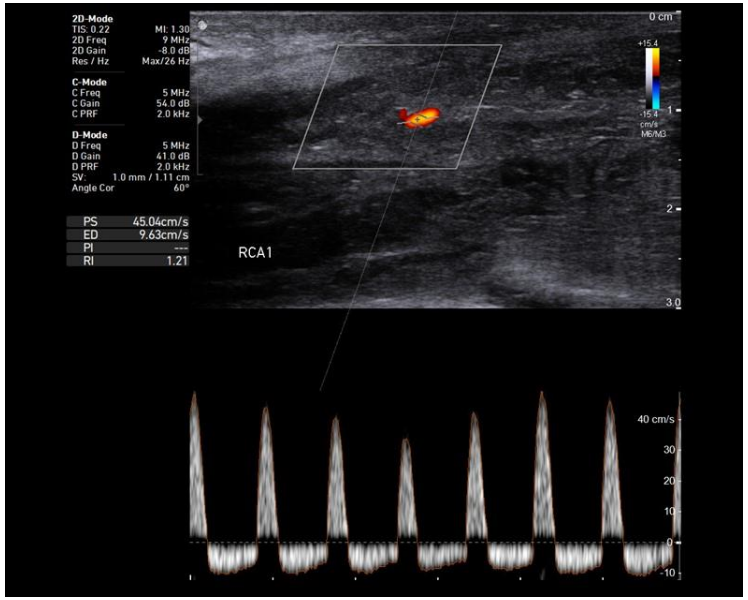
- What is it?
- - A specialized ultrasound test to assess blood flow in the penis.
- - Often done after injecting a medication (such as Trimix) to simulate an erection.

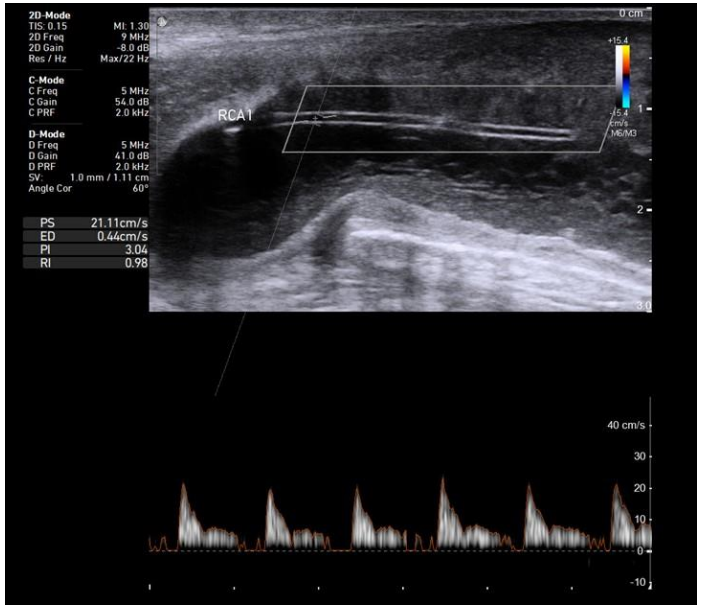
- Why is it done?
- - To determine if ED is due to poor blood inflow (arterial insufficiency) or poor blood trapping (venous leak).
- - Helps guide treatment decisions, including medications, vacuum devices, or surgery.

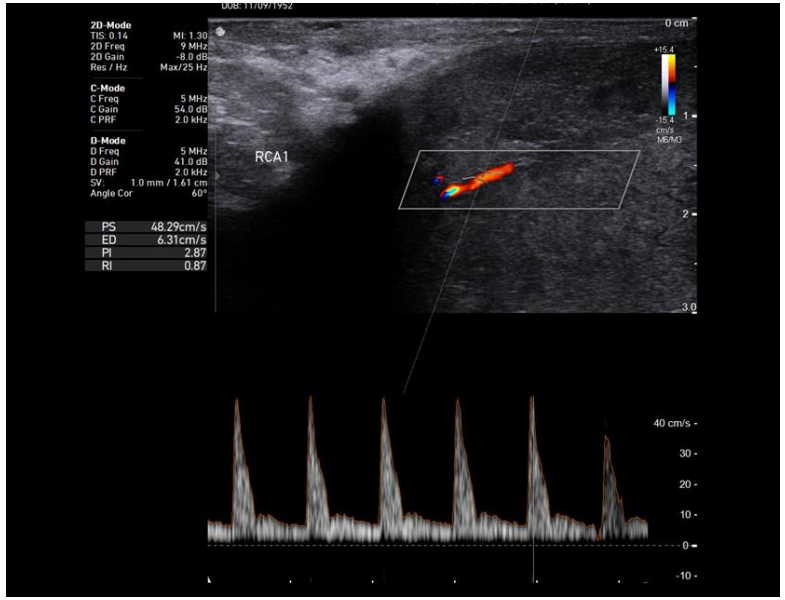


- What to expect:
- - A small injection into the penis induces an erection.
- - A painless ultrasound probe is used to measure blood flow.
- - Entire procedure lasts about 30–60 minutes.

Penile Doppler US

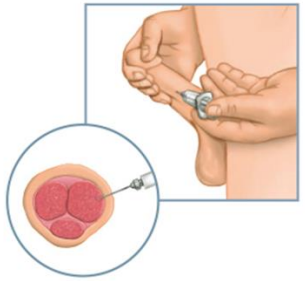




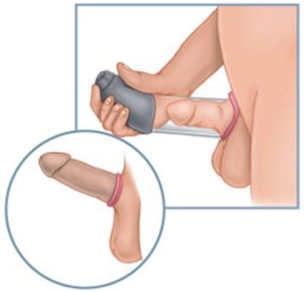


Treatment options for Erectile Dysfunction

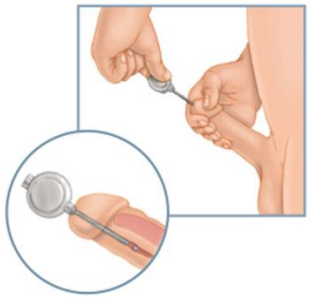
Oral Medications



Injections



Vacuum Erection Devices



Urethral Suppositories

Penile Implants

Oral medications (PDE-5 inhibitors)

How do they work?[3]

- Increases blood flow to the penis

How effective are they?

- Effective in approximately 60–80% of cases
- success rate of 40% to 50% has been reported in patients with ED associated with radical prostatectomy
- Efficacy can be affected by food[35]

Most common side effects:

- Headache, facial flushing, upset stomach

Some cautions:

- Consult doctor if on alpha-blocker therapy or taking nitrates

- **Almost half of some men with ED who try oral medications give up on the pills or they stop working.**
- **Men with history of prostate cancer are up to 2 times more likely to move on to other treatments.**

Use of Early PDE5I Before and After Surgery & Radiation Therapy

- **Pre-Surgery Use of PDE5 Inhibitors:**
  - Some studies suggest that starting PDE5 inhibitors prior to surgery may improve erectile function recovery.
  - Data indicates better post-surgery function if PDE5 inhibitors are used before prostatectomy.
  - A study showed a 30% improvement in post-operative erectile function with early PDE5 use.

- **Post-Surgery & Post-Radiation Use:**
  - Early use of PDE5 inhibitors (Viagra/Cialis) after surgery/radiation may reduce the risk of fibrosis and penile shortening.
  - A study (2018) found that early use of PDE5 inhibitors in radiation therapy patients led to a 40% improvement in erectile function but minimal impact on length preservation.

- **Conclusion:**
  - While PDE5 inhibitors are beneficial for erectile function, their role in preventing length loss is still uncertain.

Other Therapies for Penile Rehabilitation and Length Preservation

- **Penile Vacuum Erection Devices (VEDs)**
  - Improves blood flow, may help maintain penile length, and prevent fibrosis.
  - Can be used in conjunction with PDE5 inhibitors.

- **Intracavernosal Injection therapy**
  - Considered early use of injection therapy (1-3 months post Pca treatment)
  - Aids in length preservation by preventing fibrosis.

- **Penile Implants**
  - An option for men who do not respond to other therapies.
  - Can restore both length and erectile function.

Combination therapy

- Tadalafil 5 mg daily with 50 mg sildenafil on demand (Cui et al., 2015)
- Oral PDE5 inhibitors with psychosocial counseling (Althof et al., 2005)
- Oral PDE5 inhibitors with testosterone replacement therapy

  (Greco et al., 2006; Shabsigh et al., 2004; Spitzer et al., 2012, 2013)
- Oral PDE5 inhibitors with transurethral alprostadil (Mydlo et al., 2000; Nehra et al., 2002)
- Oral PDE5 inhibitors and intracavernosal pharmacotherapy (McMahon et al., 1999)
  - *Oral PDE5 inhibitors and vacuum erection device (Canguven et al., 2009; Chen et al., 2004)*
  - *Intracavernosal pharmacotherapy and vacuum erection device (Chen et al., 1995)*
  - *Transurethral pharmacotherapy and vacuum erection device (John et al., 1996)*

Vacuum erection device (VED)

How does it work?

- A pump creates a vacuum that pulls blood into the penis and an elastic tension ring is placed at the penis base to maintain an erection

How effective is it?

- Patient satisfaction rates range from 68–80%

Most common side effects:

- Blocked ejaculation, bruising, discomfort, pain penile numbness or coldness

Most common reason for discontinuation:

- Inability to achieve and maintain a full erection
- Pain or discomfort

In one study, 86% of radical prostatectomy patients decided to move on to other sexual aids.

Urethral suppository

How does it work?

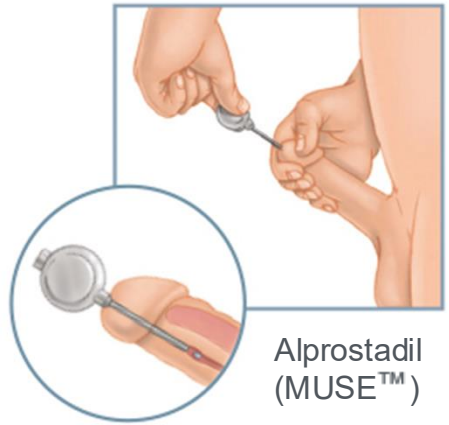
- After urination, insert the applicator stem into the urethra to deliver pellet; erection develops within 5 to 10 minutes

How effective is it?

- Success rates are reported at 40–66%

Most common side effects:

- Genital pain; minor urethral bleeding/spotting; low blood pressure; dizziness



Alprostadil (MUSE™)

Most common reasons for discontinuation:

- Insufficient erections
- Urethral pain and burning
- Switch to other ED therapy
- Natural return of erections

- **Unopened suppositories must be refrigerated.**
- **75% drop-out rate of post-prostatectomy patients after 15 months.**

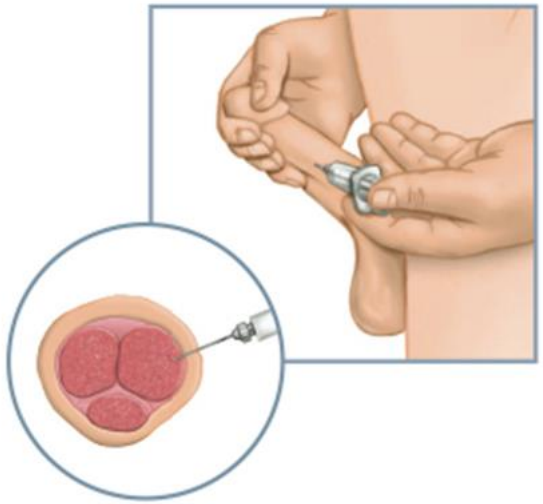
Intracavernous injection therapy

How does it work?

- Self-inject medication directly into penis, erection may develop within 5 to 20 minutes

How effective is it?

- Successful in producing an erection 70-90%
- Despite success rates, approximately 40% of men discontinue the therapy, typically within 6 months



Most common side effects:

- Penile pain, prolonged erection, scar tissue blood collection under the skin at injection site

Most common reasons for discontinuation:

- Failed erections
- Pain
- Dislike of injections

- **A large number of studies have demonstrated that withdrawal rates are relatively high among injection therapy patients.**

Surgical therapies for Erectile Dysfunction

Penile implants are electively placed in patients who:

-Have failed non-surgical management of erectile dysfunction (ED)
-Who are not candidates/tolerate for non-surgical management

-Severe Peyronies Disease

Penile implant

How does it work?

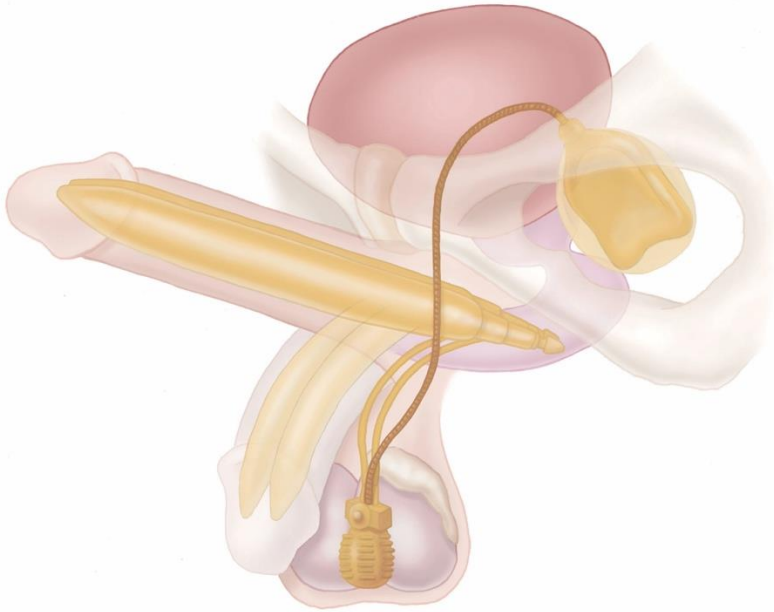
- Squeezing the pump moves fluid to create an erection; the penis returns to a flaccid state by pressing the deflate button

How effective is it?

- 98% of patients reported erections to be “excellent” or “satisfactory”

Most common side effects/complications

- Post-operative genital pain or infection
- Mechanical malfunction



- **At 7 years, 94% are still fully working.**

Surgical Management of Erectile Dysfunction

Malleable Prosthesis	Inflatable Prosthesis
"Rod" - bendable silicone rods	"The pump" - 3 pieces
Bend up for an erection	Pump up for an erection
Faster surgery, less complications	Longer surgery, more complications
Penis always feels "erect"/firm	Penis will be flaccid when not in use

Three Piece Penile Prothesis

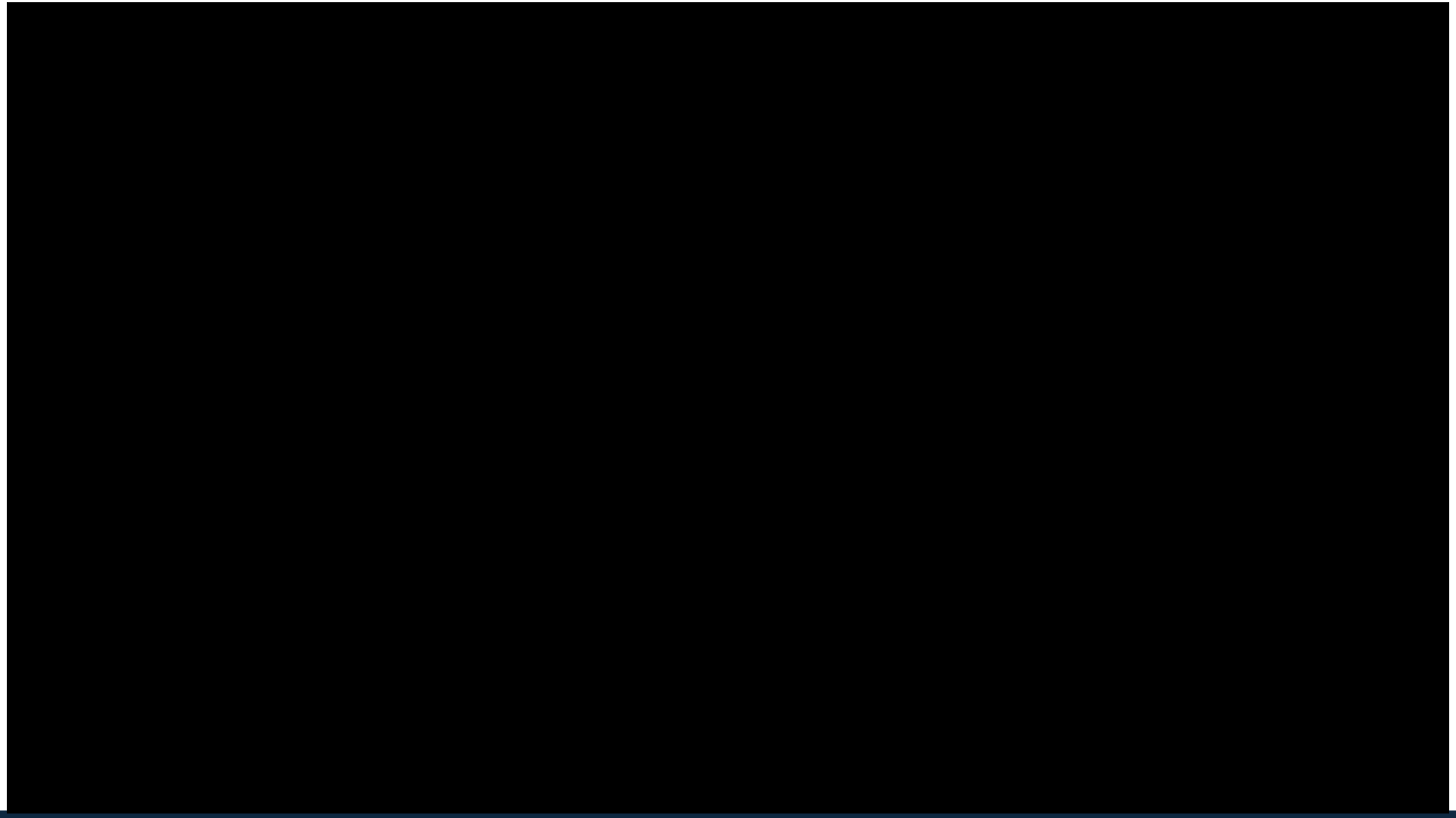
- **AMS/BS 700 Models**
  - LGX – length and girth expansion
  - CX – girth expansion only
  - CXR – narrow base
- **Coloplast Models**
  - Titan – girth expansion, rigidity, Hydrophilic
  - Titan Narrow

CWW 12th Edition
& Company Sites

Figure 3 – AMS 700

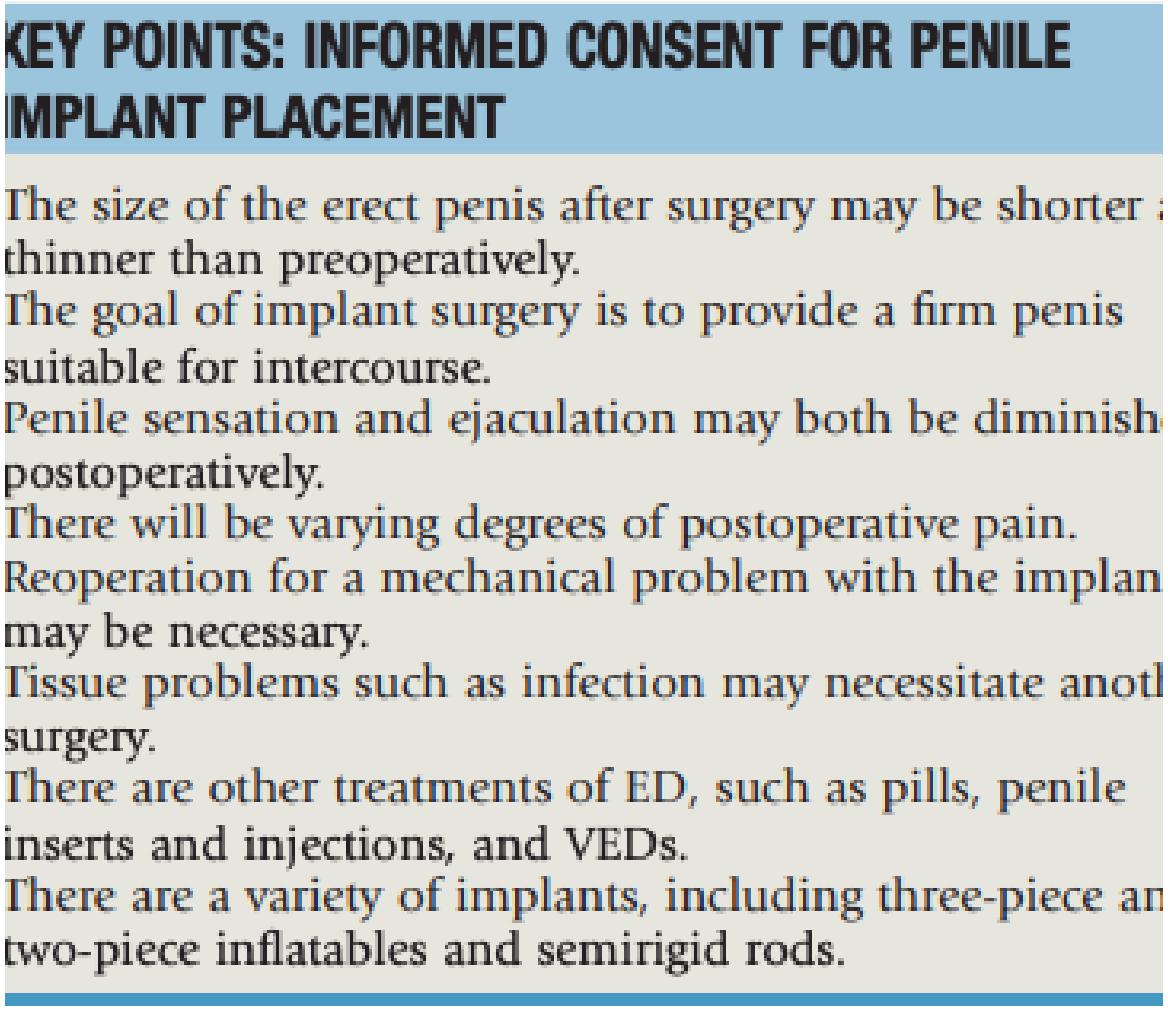
Figure 4 – Coloplast Titan

How it works



Penile prosthesis

- **Pre-Op Counseling**
  - Setting expectations is key
  - Appearance, sexual function, length/girth, injury during surgery, mechanical life span
  - Post-op pain, operating pump
- **Imaging**
- **Labs**
  - Urine culture
  - Glucose (serum), A1c



KEY POINTS: INFORMED CONSENT FOR PENILE IMPLANT PLACEMENT

The size of the erect penis after surgery may be shorter
thinner than preoperatively.
The goal of implant surgery is to provide a firm penis suitable for intercourse.
Penile sensation and ejaculation may both be diminish postoperatively.
There will be varying degrees of postoperative pain.
Reoperation for a mechanical problem with the implan may be necessary.
Tissue problems such as infection may necessitate anotl surgery.
There are other treatments of ED, such as pills, penile inserts and injections, and VEDs.
There are a variety of implants, including three-piece an two-piece inflatables and semirigid rods.

As a surgical procedure, there are possible risks

There are risks involved with any surgery. Not all patients are candidates for a penile implant. Discuss all the risks and benefits of this procedure in more detail with your doctor.

Some risks of a penile implant may include:

- Will make natural or spontaneous erections as well as other interventional treatment options impossible
- There may be mechanical failure of the implant, which may require revision surgery
- Pain (typically associated with the healing process)
- Men with diabetes, spinal cord injuries or open sores may have an increased risk of infection
- There is a 1.2–2.5% risk of infection with the Boston Scientific inflatable penile implants

Testosterone Therapy After Prostate Cancer Treatment

Background and Importance

- Testosterone is essential for male health and quality of life.
- Prostate cancer treatments often suppress testosterone.
- Impacts quality of life, sexual health, and overall well-being.
- Many men do not recover normal levels post-treatment.

Causes of Low Testosterone

- ADT suppresses testosterone to control cancer growth.
- Radiation can affect testicular function.
- Surgical treatments (e.g., orchiectomy) eliminate testosterone production.

Symptoms of Low Testosterone

- Fatigue, low libido, erectile dysfunction
- Depression, irritability, cognitive slowing
- Decreased muscle mass and bone density
- Symptoms significantly affect personal relationships and self-esteem.
- Testosterone replacement therapy (TRT) may help improve symptoms in carefully selected patients.

TRT Usage in Prostate Cancer Survivors

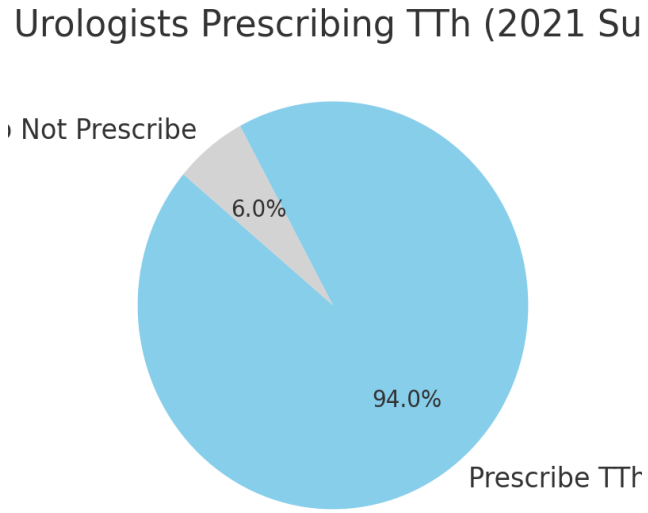
- Historically low due to recurrence concerns.
- Newer studies support cautious use post-curative therapy.
- Regular monitoring essential (PSA, testosterone, symptoms).

Changing Clinical Perspectives

- Historical concern: TRT believed to stimulate prostate cancer
- Emerging model: Androgen Saturation Theory
- New evidence shows TRT may be safe post-treatment in select cases

U.S. Urologist Survey on Testosterone Therapy in Prostate Cancer

- Key Findings
  - 94% of U.S. urologists prescribe testosterone therapy (TRT) to men treated for prostate cancer
  - Most prescriptions occur post-treatment, particularly after radical prostatectomy or radiation
  - Additionally, 65% would offer TRT to men on AS. Despite this only 35% had prescribed TRT to patients on AS.

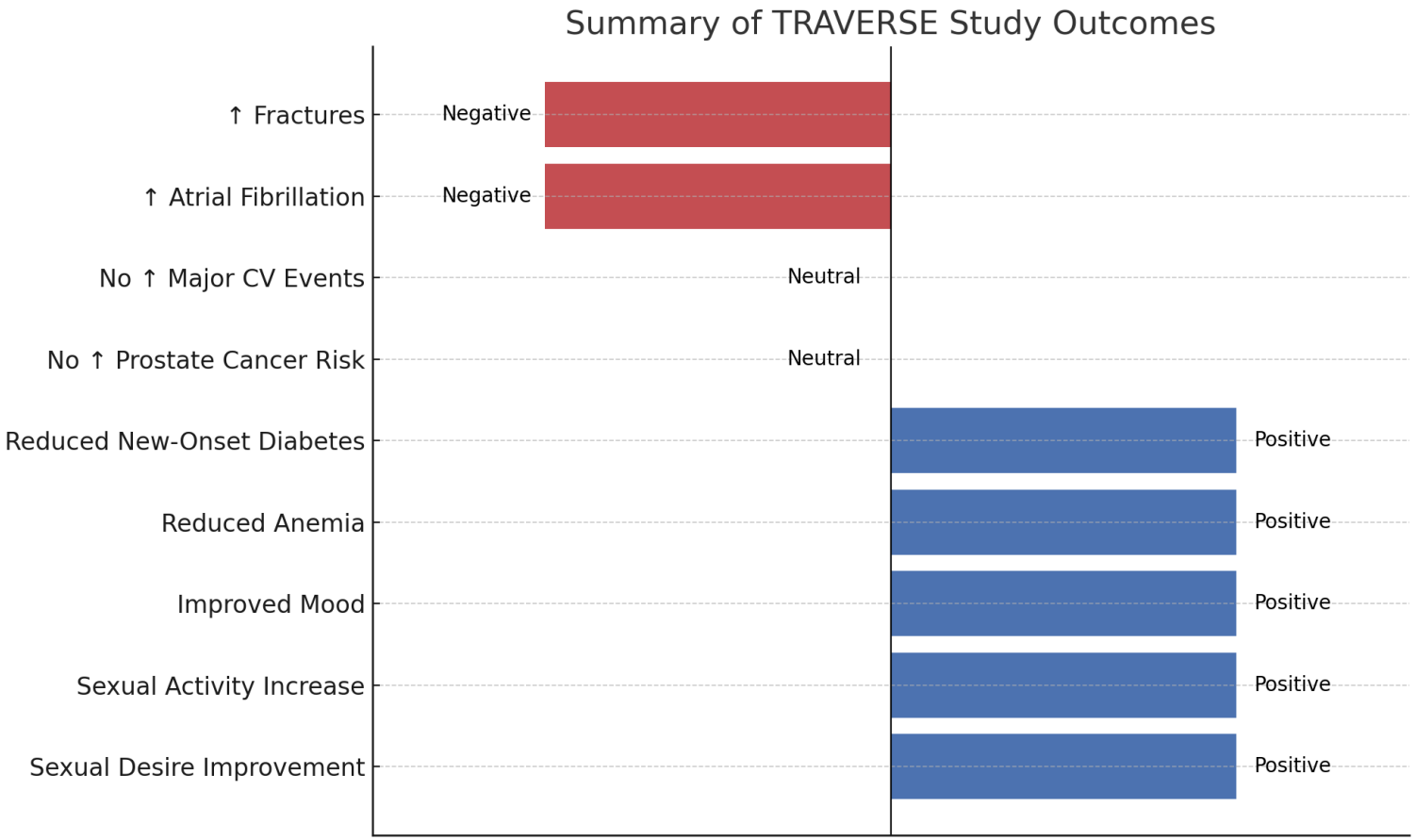


The TRAVERSE Study – Overview

- **Study Design**:
  - Multicenter, randomized, double-blind, placebo-controlled trial.
  - Included 5,246 men aged 45–80 with low testosterone and high cardiovascular risk.
  - Participants received daily transdermal testosterone gel or placebo for an average of 27.1 months.

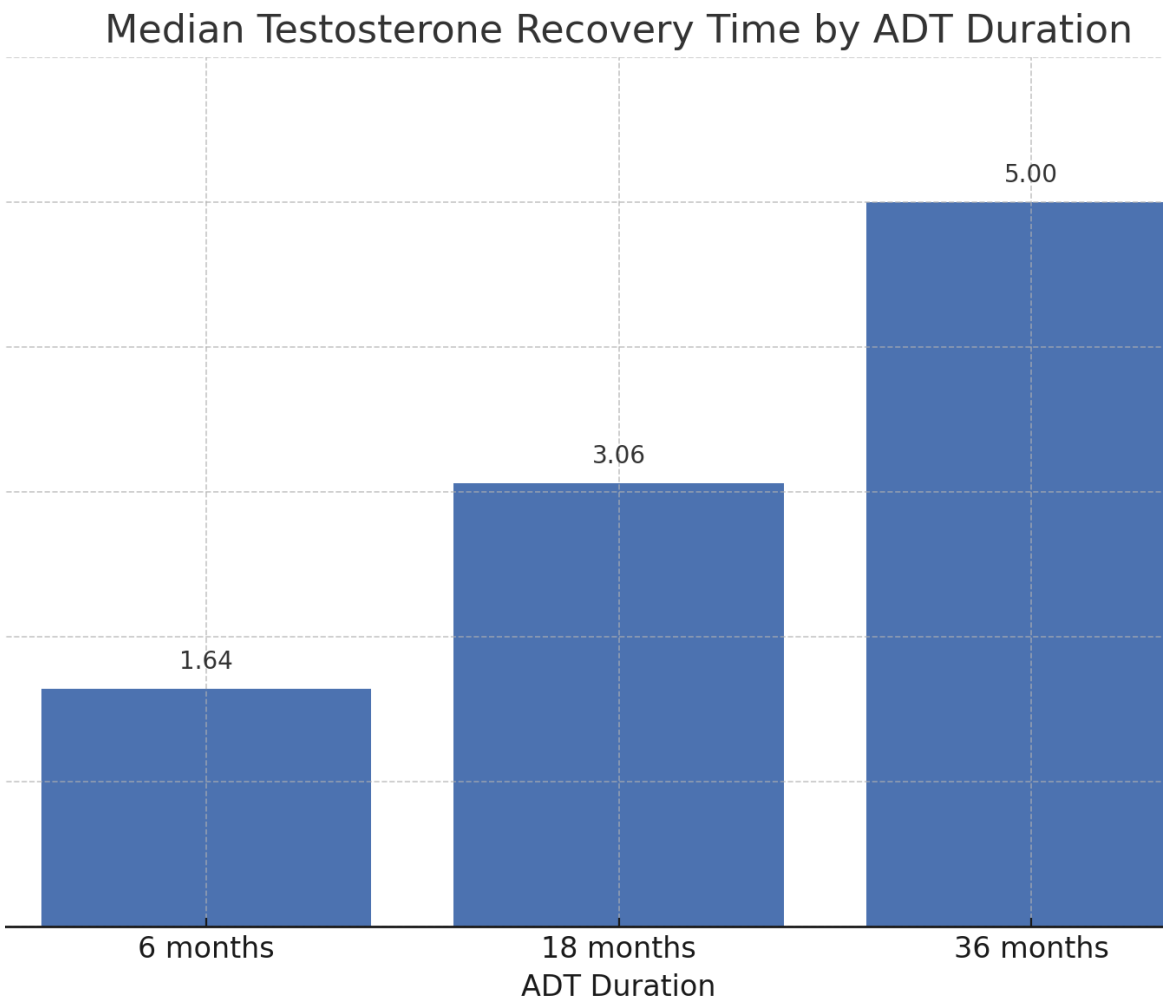
TRAVERSE Study – Key Findings

- **Cardiovascular Safety**:
  - No significant increase in major adverse cardiac events compared to placebo.
- **Prostate Health**:
  - No increased risk of prostate cancer or prostate-related events.
- **Additional Benefits**:
  - 22.5% reduction in new-onset diabetes.
  - Improvements in sexual desire, activity, mood, and anemia.
  - Slight increases in atrial fibrillation and fractures observed.


Summary of TRAVERSE Study Outcomes
↑ Fractures
↑ Atrial Fibrillation
No ↑ Major CV Events
No ↑ Prostate Cancer Risk
Reduced New-Onset Diabetes
Reduced Anemia
Improved Mood
Sexual Activity Increase
Sexual Desire Improvement
Negative
Negative
Neutral
Neutral
Positive
Positive
Positive
Positive
Positive

Testosterone Therapy Use After Androgen Deprivation Therapy (ADT)

- **Key Points:**
  - **Context**:
    ADT is a mainstay of prostate cancer treatment that significantly lowers testosterone. Some men experience prolonged or even permanent hypogonadism following ADT.
  - Median recovery:
    - 6 months ADT: ~1.6 years
    - 18 months ADT: ~3 years
    - 36 months ADT: ~5 years
  - **Clinical Hesitancy**:
    Historically, TRT has been contraindicated in men with a history of ADT due to fears of:
    - Reactivating dormant prostate cancer cells.
    - Increasing PSA or biochemical recurrence.



Testosterone Therapy Use After Androgen Deprivation Therapy (ADT)

- **Emerging Evidence**:
- Recent studies show that **select patients post-ADT can safely receive TRT**, especially if they:
  - Have non-recurrent disease.
  - Have been off ADT for a sustained period.
  - Are experiencing persistent, symptomatic hypogonadism.
- Small series and cohort studies suggest **no significant increase in PSA or cancer recurrence** when TRT is used cautiously.
- "For a subset of prostate cancer survivors who remain hypogonadal after ADT, testosterone therapy may offer quality-of-life benefits without significantly increasing cancer risk—if carefully selected and monitored."
  — *Journal of Urology, 2024*

Who Is a Good Candidate for TRT?

- Completed curative treatment for low-risk/Intermediate PCa
- No evidence of recurrence (stable/undetectable PSA)
- Symptomatic hypogonadism with low serum testosterone
- Motivated and well-informed patient/Reliable
- Cautions and Concerns
  - Active High-risk or advanced disease still contraindicated for TRT

Monitoring Protocol During TRT

- PSA every 3–6 months
- Total testosterone, hematocrit monitoring
- Annual digital rectal exam
- Stop if PSA rises or hematocrit >54%

Conclusion

- **Summary**:
  - Prostate cancer treatment will affect sexual function and quality of life for most men
  - Recovery can take 1-2 years and many never recover to pre-op condition.
  - Non-surgical and surgical options exist for sexual function and ED
  - Many patients that do need to undergo surgical management can obtain high quality of life and satisfaction rates

Conclusion

- **Summary**:
  - Low testosterone is a common consequence of prostate cancer treatments.
  - Recovery varies based on multiple factors; some men may experience prolonged hypogonadism.
  - TRT can be a viable option for improving quality of life in select patients, with careful monitoring.
  - Ongoing research, like the TRAVERSE study, continues to inform best practices.

EDCURE.ORG

YOUR ED QUESTIONS ANSWERED

Text EDCure to 73771

to receive informative videos

With just a few clicks, this quiz will help you assess the severity of your ED symptoms and how Erectile Dysfunction may be impacting your life.

- Grab your Smartphone…
- Open your camera…
- Hover over the code…
- Click the link…
- Take the quiz!

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Questions ?

Thank you!