
Penile Rehabilitation after Radical Prostatectomy

The PRO Position

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FACTS

- EFR not routine after RP: 55% (14-97%)
- Back to baseline EFR uncommon: 22% (4% >60y)
- Technology has not changed these figures
- ED independent predictor of bother and depression
- Greatest barrier to rehabilitation is surgeon apathy
- Greatest patient barrier is cost of medication

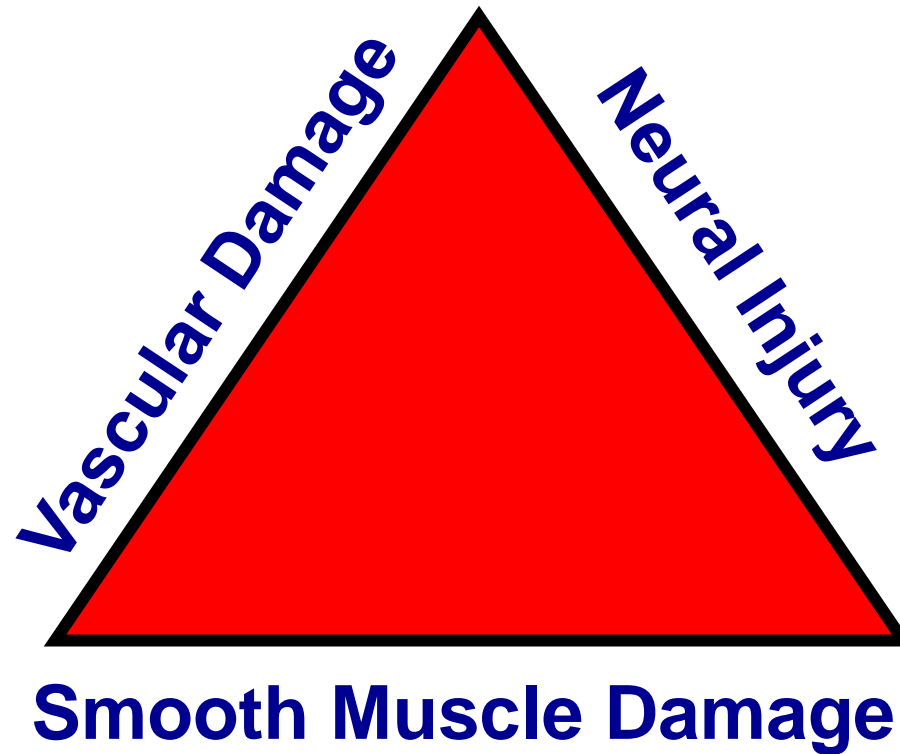


Dr. Trost will say

- Its costly!
- There are side effects
- There is no level 1 EBM
- The animal model is not representative of humans

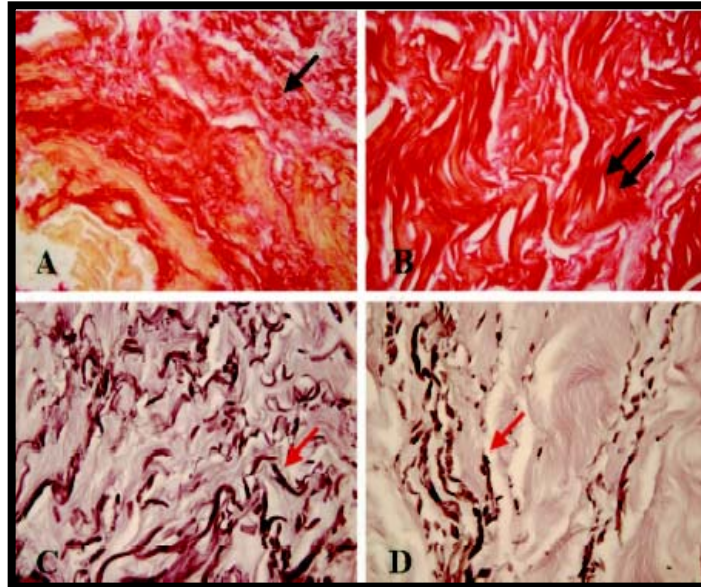


ED Pathophysiology



CCSM Alterations After RP

Pre-op



2 Months After
RP

Elastic and collagen fibers in 19 patients before, and 2 and 12 months after radical prostatectomy

	Mean Fibers \pm SD	
	Elastic/High Power Field	Collagen/% Biopsy Area
Before	129.32 \pm 13.13	44.80 \pm 5.73
After 2 mos	80.80 \pm 23.26	55.05 \pm 5.29
After 12 mos	44.20 \pm 11.58	73.10 \pm 7.85

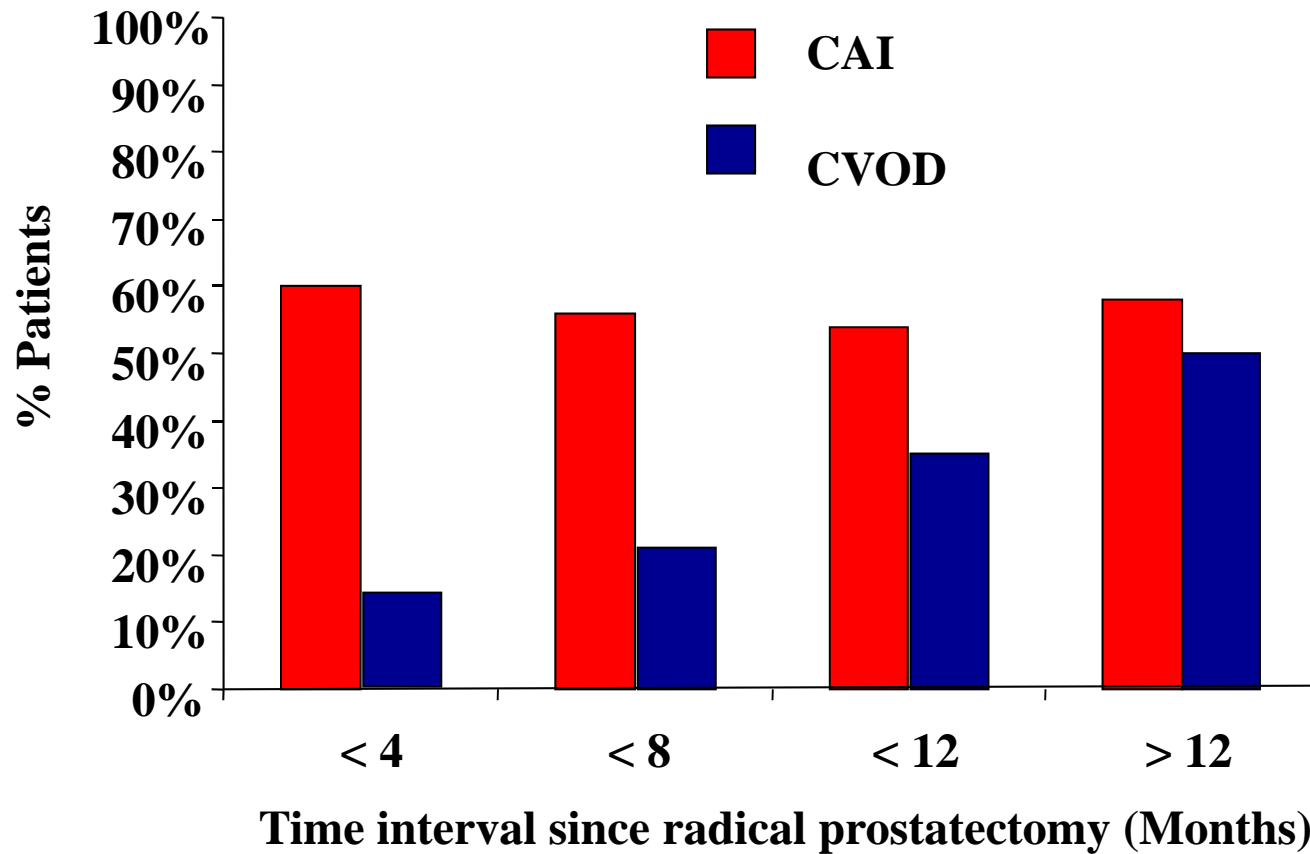
Before vs after 2 and 12 months, and after 2 vs 12 months $p < 0.0003$.



ERECTILE DYSFUNCTION AFTER RADICAL PROSTATECTOMY: HEMODYNAMIC PROFILES AND THEIR CORRELATION WITH THE RECOVERY OF ERECTILE FUNCTION

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Penile Rehabilitation

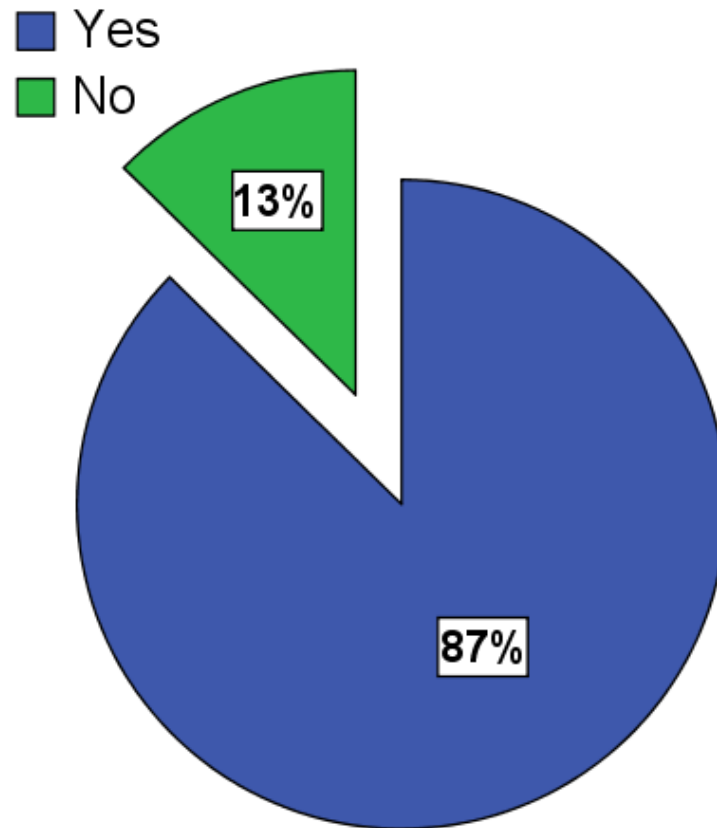
- **Definition:** Penile rehabilitation is defined as the use of any drug or device to maximize erectile function recovery
- **Purpose:** The prevention of smooth muscle and endothelial structural alterations to maximize chances of a man returning to his preoperative erectile function level
- **Candidates:**
 - Radical pelvic surgery
 - Pelvic radiation
 - Diabetes
 - Pelvic fracture



Penile Rehabilitation Survey

ISSM Members

Do you perform Penile Rehabilitation ?



ICSM 2009 Recommendation

Grade C

Given the strong animal and basic science evidence and understanding the strengths and weaknesses of the existing human studies and the negative consequences of long-term ED after RP, **the committee suggests that penile rehabilitation has significant potential benefits for the patient/partner and should be considered after RP.**



Animal Data

- Muller A et al. The functional and structural consequences of cavernous nerve injury are ameliorated by sildenafil citrate. J Sex Med, 2008; Epub ahead of print
- Kovanecz I et al. Long-term continuous sildenafil treatment ameliorates CVOD induced by cavernosal nerve resection in the rats. IJIR, 2008; 20:202
- Ferrini M et al. Vardenafil prevents fibrosis and loss of smooth muscle after bilateral cavernosal nerve resection in the rat. Urology, 2006; 68:429
- Vignozzi L et al. Effect of chronic tadalafil administration on penile hypoxia induced by cavernous neurotomy in the rat. J Sex Med; 2006; 3:419
- Kovanecz I et al. Chronic daily tadalafil prevents the corporal fibrosis and venoocclusive dysfunction that occurs after cavernosal nerve resection. BJUI; 2008; 101:203
- Lysiak JJ et al. Tadalafil increases AKT and extracellular signal-related kinase 1/2 activation and prevents apoptotic cell death in the penis following denervation. J Urol, 2008; 179:779



RCT in Post-RP Rehabilitation

- **Sildenafil¹**

- n=76, BNS, P v S50 v S100, 1-9m
- Natural erections assessed at 11m
- 27% responders in V v 4% in P arm

- **Vardenafil² (REINVENT)**

- n=483, BNS, P v L10 QD v L20 OD, 1-9m
- Assessments: 9m (EOT), 11m (P), 13m (V)
- L20 OD > L10 QD at 9m, no Δ at 11 or 13m

- **Tadalafil³ (REACCT)**

- n=423, BNS, P v C5 QD v C20 OD, 1-9m
- Similar assessment and outcomes to REINVENT
- Penile length preservation



Current Rehabilitation Strategies

- **PDE5i**

- Prevention of endothelial structural alterations^{1,2}
- Prevention of smooth muscle structural alterations³
- Preservation of smooth muscle relaxation profile⁴
- Neuroregeneration^{5,6}
- Erection-independent cavernosal oxygenation?⁷

- **ICI**

- Oxygenation +++
- CCS < stretch

- **VED**

- Stretch

1. Rosano et al. Eur Urol 2004; 2. Desouza et al. Diabetes Care, 2002;
3. Schwartz et al. J Urol 2007; 4. Wayman et al. ESSM 2006; 5. Zhang et al. Stroke 2002;
6. Zhang et al. Brain Research, 2008; 7. Ghofrani et al. JACC 2004



Given the potentially devastating consequences of **acute** onset, **long-term** ED after RP, should we not be **discussing** rehabilitation with these men while we await **definitive** evidence confirming or refuting its benefit and thus **facilitate** the patient to making the final decision



Principal Arguments Against

- Unproven strategy - Lack of level I EBM
- Translating animal data to human model
- Cost



Principal Arguments in Favor

- ED associated with depression and reduced QOL
- Apathy leads to time-dependent changes in CCSM
- Signals from studies are clear & robust
- Sexual medicine experts are routinely doing rehabilitation post-RP



Is Dr. Trost?

