Clinical Practice Guidelines: Sexuality and Reproductive Health in Adults with SCI
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Stacy Elliott, MD
Medical Director, BC Center for Sexual Medicine
Clinical Professor, UBC
Departments of Psychiatry and Urological Sciences
PI, International Collaboration on Repair Discoveries (ICORD)
stacy.elliott@vch.ca
Disclosures

Stacy Elliott, MD

- CME developer
- Advisory board member
- Speaker’s Bureau

E.Lilly, Pfizer, Bayer, Abbott
Learning Objectives

At the conclusion of this activity, the participant will be able to:
1. State the process of developing a clinical practice guidelines (CPG) by the Consortium of Spinal Cord Medicine
2. Identify at least one source for obtaining electronic or paper versions of the CPG
3. State at least 3 essential components of the physical examination in order to assess sexual function in a person with SCI
4. State at least three signs or symptoms suggestive of testosterone deficiency
5. Indicate the proper ways of discussing sexuality with persons with spinal cord injuries
My objectives

- Inform you of the neurology involved in sexual functioning
- What to expect to see in a physical exam that helps you predict sexual function
- A user friendly framework to look at complexity of sexual and fertility rehab
- Discuss some therapies and resources
My objectives

• Inform you of the neurology involved in sexual functioning
Sexual Neurophysiology

3 nervous systems are responsible for the sexual responses:

1. Thoracolumbar sympathetic
2. Sacral parasympathetic
3. Somatic (pelvic floor / genitalia)

There must be a removal of supratentorial inhibition before reflexes are initiated
**Sex Response Cycle**

- Orgasm (Ejaculation)
- Orgasmic threshold
- Arousal (Erection, vaginal lubrication)
- Parasympathetic
- Sympathetic
- Refractory period
Arousal Physiology after SCI

- Persons with high level lesions have reflex erections/lubrication (generated from touch) but not from mental stimulation alone.
- Persons with low level lesions may have erections/lubrication to mental arousal but not to touch.
- Completeness of SCI effects response.
Common problems for women with SCI

- **Arousal difficulties**
  - sense of subjective arousal may or may not be present: objective arousal dependant on sensory preservation

- **Orgasmic difficulties***
  - 50% may experience orgasm indistinguishable in description but takes longer and requires higher stimulus

* Papers: Marca Sipski, Beverly Whipple, Cindy Meston
Common problems for men with SCI

• **Arousal difficulties**
  - 2/3-3/4 can obtain but not necessarily maintain erections: ED complaint common

• **Ejaculatory difficulties**
  - anejaculation biggest problem
  - priority is pleasure, not fertility

• **Orgasmic difficulties** *
  - 40-50% may experience orgasm

* Papers: Alexander, Sipski, Anderson, Elliott
Does ejaculation predict orgasm after SCI?

Ejaculation and orgasm after SCI do not necessarily coincide, but ejaculation and improved erections enhance the chance of orgasm, ie sometimes the use of PDE5i can be helpful.
My objectives

• Inform you of the neurology involved in sexual functioning

• What to expect to see in a physical exam that helps you predict sexual function
Neurological Exam for Sexual Potential

Looking at capacity for:
1. Erection/vaginal lubrication & accommodation
2. Ejaculation
3. Orgasm – genital
   - other
Neurological Exam for Sexual Potential

Looking at capacity for:
1. Erection/vaginal lubrication & accommodation – sacral reflex
2. Ejaculation – lumbar and sacral reflex
3. Orgasm – genital (neural tracts)
   - other (cerebral openness)
Bulbocavernous Reflex

- Positive is confirmatory for intact sacral reflex
- Technique important
- Reflective of intact sensory and motor sacral pathways (not autonomic)
- Predictive for: reflex erection/vag arousal
- : ejaculation to VS
Pinprick/Temperature and Voluntary Anal Contraction

- **Genital orgasm** = upgoing lateral spinothalamic + downgoing corticospinal tracts
- Differentiate sharp from dull
- Rectal insertion for true voluntary anal contraction
Anal Tone

- Only test helpful for autonomic testing
- *Positive*: indicates that the lumbosacral autonomies and motor tracts are likely unimpeded
- *Negative*: may explain disordered ejaculation
Example: Exam Findings in SCI

Positive bulbocavernous reflex
  - reflex erection and ejaculation
Positive anal tone
  - intact lumbosacral cord
Negative pinprick to genitalia
No voluntary anal contraction
  - no genital orgasm, but possible non-genital orgasm or that derived from internal genitalia
SCI Sexual Potential

SCI > T9 (UMN)

Reflex erection

No psychogenic erection

Ejaculation: 10% potential on own,
60 – 70% to vibrostimulation

No genital orgasm
40- 45% orgasmic
My objectives

• Inform you of the neurology involved in sexual functioning
• What to expect to see in a physical exam that helps you predict sexual function
• A user friendly framework to look at complexity of sexual and fertility rehab
The general neurological effects of any disability on sexuality are significant.

- Bladder & bowel changes
- Decreased mobility
- Spasticity/Ataxia
- Pain
- Concomitant TBI
- Fatigue
- Altered sensation
- Depression
- Medication side effects
- PSYCHOSOCIAL
Sexual Health Rehabilitation Service 2011

Physician referrals: fax to 604-714-4191 or call 604-737-6233
# Sexual Health Framework

<table>
<thead>
<tr>
<th>Sexual Area</th>
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<td>Sexual Drive/interest</td>
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<td>Sexual Functioning abilities</td>
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<td>Fertility &amp; Contraception</td>
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<td>Factors re the condition</td>
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<td>Motor &amp; sensory influences</td>
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My objectives

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• What to expect to see in a physical exam that helps you predict sexual function
• A user friendly framework to look at complexity of sexual and fertility rehab
• Discuss some therapies and resources
Phosphodiesterase V Inhibitors (PDE5i)
PDE5i in Men with SCI

Regardless of cause, level of injury, ASIA grade and time since injury Sildenafil and Vardenafil improved erections in > 85% of the patients (concurred in the partners).

**Viagra and Levitra:** act best 1 – 4 hours after taking

: can be affected by high fat meal

**Cialis:** last 24 – 36 hours after taking

: prn and daily dosing available

: not affected by food


PDE5i in Men with SCI

Dosing reliant on NO source so start low with:
- young man
- reflexogenic but unreliable erection
- hypotensive
- liver or kidney dysfunction

Increase the dose (need > 6 tries)

Be sure to outline the correct timing and why
Prescribe for efficacy and cost
Nitrates are contraindicated
Treatment of Sexual Dysfunctions Following SCI:
Phosphodiesterase inhibitors (PDE5)

Advantages
oral
noninvasive
safe for most men
negligible risk of priapism
lifetime use may help retain natural function

Disadvantages
hypotension
facial flushing
confusion with AD
less effective with lower injuries
rigidity not as good as with injections
Q. Is it safe to use PDE5 inhibitors in patient with SCI?

A: yes as long as not on nitrates (even for AD) some evidence of long term endothelial protection
NO-cGMP Mechanism involved with PDE5 Inhibitor Mechanism of Action and PGE1 with intracavernosal injections

- **Guanylate cyclase** converts GTP to cGMP
- cGMP activates protein kinase G (PKG), which then phosphorylates target proteins.
- **Smooth muscle relaxation** and erection occur.

**Cavernous nerve** releases NO, which diffuses to the endothelial cells.

Endothelial cell that releases PDE5.

**PDE5** hydrolyzes cGMP to 5'GMP.

**PGE1** increases cAMP levels.

**Smooth Muscle Cell**

- Decreased Ca^{2+}
- Increased K^{+}

Ignarro L. J Pharmacol Exp Ther 1981;218:739
**INTRACavernosal INJECTION**

- **corpus cavernosum**
- urethra
- proper site of injection
Treatment of Sexual Dysfunctions Following SCI:

**Intracavernosal Injections**

**Advantages**
- small doses
- rarely need Bi-Trimix
- reliable
- best rigidity
- may be painless

**Disadvantages**
- priapism risk
- long term invasive therapy
- fibrosis

**Intraurethral Micropellet of PGE1 (MUSE)**

**Advantages**
- less invasive
- “catheter” familiarity

**Disadvantages**
- poor responsiveness
- Actis ring necessary
- hypotensive possibility
- may have urethral stricture
Treating Erectile Dysfunction
Physical Methods

Vacuum device

Constrictor bands
Treatment of Sexual Dysfunctions Following SCI: Vacuum devices and Constrictor Bands

• Can be beneficial to those men who cannot tolerate medications
• constrictor band can only remain on for 30 minutes - SCI may not feel a band that remains on
• watch anticoagulation therapy
• should demonstrate
• bands alone can maintain a reflex erection
Treating Erectile Dysfunction with Surgical Methods
Hypogoandism

Clinical condition characterized by partial androgen deficiency in systemic blood flow and/or decreased genomic sensitivity to testosterone or its active metabolites

- decreased lean body mass and diminution muscle volume and strength
- decreased bone mineral density resulting in osteoporosis and osteopenia
- increase in visceral fat
- sexual function changes
- changes in mood

Why are men with SCI at risk for hypogonadism?

- SCI = Chronic illness
- Bladder and testicular infections
- \( \text{?} \) denervation of the testicles (softening)
- Brain injury +/- problems with pituitary gland or hypothalamus
- Metabolic problems and diabetes
- Medications which suppress testosterone (cimetidine, pain meds, etc)
Testosterone Effectiveness in Improving Symptoms

- 6% reduction in body fat
- 3-4% increase in lean body mass and bone density *
  SCI immobility a ++ risk factor
- Diversified threshold effect on libido and erectile function but helps orgasmic potential
- Positive effect on metabolic parameters (insulin insensitivity, glucose control, visceral adiposity, hyperlipidemia) in patients with type 2 DM and chronic heart failure+ (reduce BMI and visceral fat)
- Promote vascular smooth muscle and endothelial cell proliferation and induces vasodilation and improve vascular reactivity

Jones RD, Am J Cardiovascular Drugs. 2005; 5(3): 141-54
Hypogonadism and depression can co-exist:

Testosterone replacement can result in:

- Alleviation of mild depression and irritability of moods
- Potentiation of the antidepressant effect (if previously responded well to antidepressants, and no longer do, check testosterone)
- More complete response in refractory depression
Testosterone Replacement Therapy

- **Injectable**
  - Depot T (100 mg/ml) and Delatestryl (200 mg/ml)
  - LA injectable TU (Nebido) *not yet in Canada*

- **Oral** (testosterone undecanoate or TU) *not in USA*
  - Andriol ® (Organon)

- **Transdermal Patch**
  - Androderm, Testoderm TS

- **Transdermal Gel**
  - Androgel ® (Abbott)
  - Testim ® (Paladin)

- **Implantable Pellets**
Treating Sexual Dysfunctions after SCI

For **men**, there are many options for ED
- Oral: Phosphodiesterase V inhibitors (PDE5i) 80%
- Penile Injections 95%
- Vacuum devices and rings: effective but less attractive
- Intraurethral and topical: not as effective 10 – 50%
- Surgical implants: last resort
- Testosterone to help with sexual function and mood

For **women**, there are no drugs on the market effectively enhancing arousal or orgasmic capacity
- Eros may have potential
- Sildenafil may help a few
Only erectile tissue will be effected by PDE5ior PGE1

SCI -may help esp incomplete : Borderline significance subjective arousal and some non-significant increase in vaginal pulse amplitude (Sipski ML, Rosen RC, Alexander CJ, Hamer RM., 2000)

Since only affects erectile tissue, may increase sensation due to vasocongestion: helps about 1/3 of women with MS. Does not directly influence sexual drive or orgasmic capacity
Conditions that Facilitate Sexual Pleasure and Orgasm

- Relaxation, meditation, dreams
- Fantasy, recalling positive experiences
- Breathing, going with the flow
- Trust or being with a partner who is trusted
- Addition of nongenital touch, plenty of time, added stimulation of a vibrator

Lived Experiences:
Tepper ISSWSH 2002
Mechanical Strategies

- Decreased sensation
- Arousal difficulties
Love Swings
Positioning Aids

Liberator shapes

Love Bumpers

Thigh Sling
Free download  [www.dhrn.ca](http://www.dhrn.ca) under disability resources
(DHRN.ca: Disability Health Research Network)

**pleasureABLE**

SEXUAL DEVICE MANUAL FOR PERSONS WITH DISABILITIES

**Kate Naphtali**,  
**Edith MacHattie**, MOT  
University of British Columbia (UBC)  
Vancouver, BC Canada

*Under the supervision of*

**Dr. Andrei Krassioukov**, MD, PhD, FRCPC  
Associate Professor, Div. Phys.Med. & Rehab, UBC  
G.F. Strong Rehabilitation Centre  
Faculty, ICORD

**Stacy L. Elliott**, MD  
Director, B.C. Centre for Sexual Medicine  
Clinical Professor, Dept of Psychiatry and Urological Sciences, UBC  
GF Strong Rehabilitation Center  
Faculty, ICORD
Content of PleasurAble

- Health Care Clinicians
- Anatomy
- Routines
- Safety
- Devices for Different Physical Abilities
- Further Adaptations of Devices
- Positioning For Sexual Activity
- Making Parts Fit
- Personal Lubricants
- Safe Sex

Products:
- Devices for Penetration
- Harnesses
- Positioning Products
- Hands Free
Example Positions:
Fleshlight

Description:
- Realistic penetration device
- Made with Real Feel Superskin, also known as cyberskin (non-allergenic, no latex, no silicone)
- Easy to grip with one or two hands
- Discreet option that comes with a screw-on lid
- No batteries or plug-in required

Price:
$75.00 (Come As You Are)

Cleaning:
The insert is removable for cleaning. Use a soft cloth/sponge to clean inside. Can be challenging.

Safety:
Use with adequate lubrication and clean after each use.

Special Considerations:
Need active wide grasp, lightweight.
Liberator Shapes

**Description:**
- Soft-core foam positioning pillows that can be used in a variety of ways during sexual activities
- Wedge, ramp, and rocking pillows are available
- Soft micro-fibre covers come in a variety of colors and prints

**Special Note:** ‘Black Label’ line is available. This line of positioning pillows includes snaps and buckles to attach soft cuffs and tethers.

**Price: Wedge**
- $85/ $115 Black Label; Ramp $140/
- $150 Black Label; Scoop $235/
- $285 Black Label
(Liberatorshapes.com)

**Cleaning:**
- Pillow covers are machine washable.

**Safety:**
- Use caution when transferring and maneuvering on the pillows.

**Special Considerations:**
- Need to be able to transfer on/off, may need assistance to position pillows.
Sexuality and Reproductive Health in Adults with Spinal Cord Injury:
A Clinical Practice Guideline for Health-Care Professionals

Patient companion book now available
Sperm Retrieval After SCI

Vibrostimulation & Electroejaculation

Caution: Autonomic Dysreflexia
Easy, fast, repeatable, may do at home
Art and a science to the technique
Reliant on an intact lumbosacral reflex
Reflex erections and +BCR promising signs
Higher the lesion = less interference

Penile Vibrostimulation (PVS)
Additional PVS Techniques: Double PVS and AES
Electroejaculation

EEP is more invasive and time consuming, less repeatable, and may require anesthesia.

Current delivered 2-5 V increments, held for 5 sec, then turned off (ejaculation occurs when current is off since pressure differential between the internal and external urinary sphincters favors antegrade vs. retrograde flow when current is off).

Success rate 95% (in all, not just SCI).

5% failure rate due to pain at low voltages (1-4 V) of fist trial.
Fertility for Men with SCI

- Those men with lower and incomplete lesions have better chance of ejaculating
- Methods for sperm retrieval successful in most men
  - vibrostimulation > T10 : 60 – 90%
  - electroejaculation : 95%
  - operative retrieval not usually necessary and most expensive
- Intravaginal, intrauterine and IVF/ICSI
- Fatherhood expectations at least 50%
Sexual and Fertility Rehabilitation are major quality of life issues for persons with SCI: responsibility is ours to address this!
Recommendations for Future Research (Medical)

• Further evaluate the role of SCI on testosterone levels and TRT benefits (sexual, bone, mood)
• Develop additional oral medications for men with SCI who do not respond to current treatments.
• Advance the field of female sexual difficulties after SCI including medical therapies.
• Explore sacral nerve stimulation to improve sexual arousal and orgasm for people with SCI.
• Neuroplasticity factors – who adapts and why
• Design better adaptable vibrators and educational films
• Improve the avoidance of autonomic dysreflexia with sexual activity and sperm retrieval
Obtaining CME Credit

• If you would like to receive CME credit for this activity, please visit:
  http://www.pesgce.com/PVAsummit2011/

• This information can also be found in the Summit 2011 Program on page 8.
Thanks for listening!

Questions?

stacy.elliott@vch.ca
C level quad or T level para

Expect:

- + reflex erections
- + peripheral reflexes
- Dermal sensation loss ≤T10
- + bladder
- Bladder contractility
- Hyperactive sphincter
NEUROPHYSIOLOGIC MODEL OF EJACULATION

Since emission is mediated through the T11-L2 segments and ejaculation through the S2-S4 segments

- Lesions above T10 are expected to achieve reflex ejaculation (natural stimulation or PVS)
- T11 and L2 lesions are expected to show dysfunctions because emission pathway damaged
- Lesions below L2 are expected to achieve ejaculation with either reflex or psychogenic stimulation
- Sacral lesions are expected to achieve with psychogenic ejaculation

Courtesy Frederique Courtois, Montreal
Lesions between the thoracic and sacral centers

- UMN
- + reflex erections
- + psychogenic erections
- + perineal reflexes
- Dermal sensation up to L5 but not sacral

Courtesy Frederique Courtois, Montreal
Conus Terminalis Lesions

- UMN
- + psychogenic erections
- - reflex erections
- - perineal reflexes
- Anaesthesia /paraesthesia S1- S5
- Hypertonia bladder neck (Sympathetic hyperactivity)

Courtesy Frederique Courtois, Montreal
Conus Equinus Lesions

- LMN
- Variable erectile response depending on T12 – L1 to S4 – S5 injury
- T12 – L1 = loss of both psychological and reflex erection
- Lower sacral – min reflex impairment
- - loss of perineal reflexes
- Anaesth/ para - s2 = s5

Courtesy Frederique Courtois, Montreal