

Rural Spinal Cord Injury Project

A collaborative project between:

Prince Henry & Prince of Wales Hospital

Royal North Shore Hospital

Royal Rehabilitation Centre Sydney

Australian Quadriplegic Association

Paraplegic & Quadriplegic Association of NSW

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SEXUALITY AND FERTILITY

following Spinal Cord Injury



Targeting Health Professionals

© **Author:** Dr Sue Rutkowski, Director Spinal Cord Injuries
Unit, Royal North Shore Hospital

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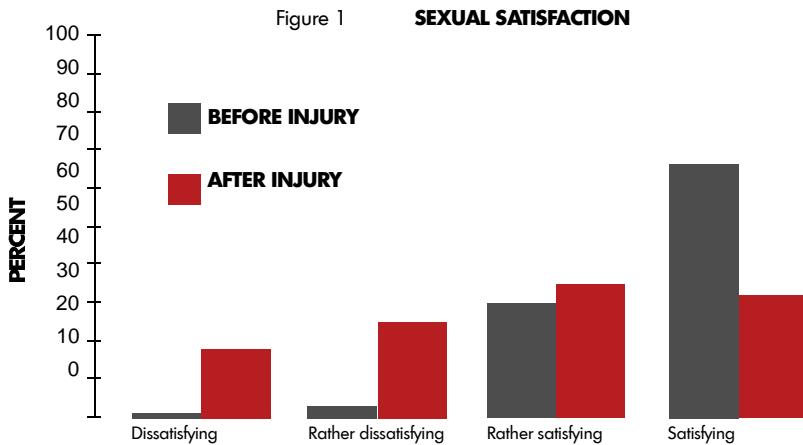
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SEXUALITY

Sexuality is the complex interaction between an individual and others involving aspects of physiological and psychological functioning.

A person who has suffered a spinal cord injury (SCI) still has all the same emotional feelings and needs as before injury and similar feelings as their peers, even though they are physically different. Physical sexual functioning will have been affected by SCI however a person with SCI does not consider themselves asexual.

Changes in different aspects of sexuality have been reported (Siosteen et al, 1999) in regard to overall quality of life with physical, psychological and social adjustments. Men with SCI were studied and although suffering from severe genital dysfunction, more than half of the subjects (57%) rated their sexual relations after injury as "satisfying or at least rather satisfying" (Fig.1). The majority continued to have intercourse although many of them more seldom than before and only half experiencing orgasm (Siosteen et al, 1999).



PSYCHO-SOCIAL ASPECTS

The psychological and social consequences of SCI are closely related to sexual satisfaction and adjustment after injury. Emotional distress and depression following injury, lowered self-esteem and feelings of being physically unattractive may lead to withdrawal from social and sexual relations or deterioration of the emotional climate of an existing relationship.

Expression of our sexuality is a very private and personal part of our lives and skilled counselling is especially necessary. Alternatives in sexual expression should be discussed without undue pressure to experiment. Failure may only underline the person's conviction that he or she is isolated by the disability.

The importance of communication skills with emphasis on touching as well as education of the partner are all important aspects of treatment. Listening becomes an important aspect of the counselling management. Adjustment can be facilitated by Health Care Workers who are sensitive to the effects of SCI on an individual's body image and changes in physical sexual function.

The individual and family members will need to have been given sufficient factual information to enable them to cope with both the physical and psychological hurdles.

Peer counselling by individuals with spinal cord injury who have made sexual adjustments will often be effective in providing appropriate counselling when carried out at a time appropriate to each patient's individual needs during the rehabilitation process (this may not be until after discharge from the rehabilitation facility).

A child with a SCI may need to be re-assured that they will grow and mature like any other child and will develop all the secondary characteristics of sexually mature adults. Special counselling may be required during puberty because all the normal concerns of adolescents will be exaggerated by the disability.

THE EFFECTS OF SCI ON SEXUAL FUNCTION

Sexual function is a complex interaction of spinal cord reflexes and supra-spinal influences, as well as hormonal and psychological factors.

Following SCI there are:

- Changes in arousal response
- Changes in orgasm
- Decreased or absent sensation
- Decreased lubrication
- Erectile dysfunction
- Decreased clitoral engorgement

NORMAL PHYSIOLOGY

Peripheral afferents are :

- Somatic S2-4 (touch) via pudendal nerve
- Parasympathetic S2-4 (pressure) via pelvic splanchnics

Spinal cord centres are :

- **Erection** sympathetic T11-L2 (psychogenic)
parasympathetic S2-4 (reflex)
- **Emission** sympathetic T11-L2
- **Ejaculation** somatic S2-4

Peripheral efferents are :

- Parasympathetic (S2-4) via pelvic splanchnic nerve 'nervi erigentes' to corpora cavernosa (erection) and prostatic gland (formation of seminal fluid)

Supranuclear pathways :

- Connect spinal reflex centres with the higher centres and all influences acting thereon.

SEXUAL FUNCTION IN MEN WITH SCI

The effects of the neurological dysfunction on sexual function in men following SCI will depend on the level and completeness of the lesion. In those with a higher cord injury the sacral reflexes, although isolated, are intact and reflex erections may occur with local stimulation, however these erections may not be sufficient for penetrative sexual intercourse. Those with lower injuries may have intact psychogenic erections which are however poorly sustained.

Erection:

- Complete (UMN) lesions above the conus (S2-4) reflex centre retain reflex erections (often unpredictable).
- Complete (LMN) lesions below or involving the conus lose reflex erections but often are able to achieve psychogenic erections (poorly sustained).
- Low cord (mixed) lesions between the sympathetic (T11-L2) and parasympathetic (S2-4) spinal centres may retain both type of erections.

Ejaculation:

- Complete (UMN) lesions above the emission centre (sympathetic T11-L2) retain only about a 5% chance of achieving reflex ejaculation without intervention.
- Complete (mixed and LMN) lesions below the emission centre (sympathetic T11-L2) may retain the ability to achieve psychogenic seminal emission (often precocious) with associated partial orgasm. True ejaculation does not occur due to interruption of the somatic outflow. Retrograde emission may occur due to inefficient bladder neck closure.

All men with complete SCI lack genital sensation, but often experience pleasurable feelings above the level during sexual activity (phantom orgasm). Discussion and counselling regarding the exploration of "new" erogenous zones may be required. Those with incomplete SCI, depending on the level, may retain significant but altered sexual functioning.

MANAGEMENT TO ENHANCE SEXUAL FUNCTION

Aspects of sexual activity should be discussed including preparation, foreplay, general pleasuring (including touching), achieving and maintaining an erection, positions for intercourse, oro-genital sex and manual stimulation.

Permission to experiment should be given without undue pressure to succeed. Communication is important in any relationship and is paramount in disability.

Practical advice about bladder management, positioning for loss of mobility or for excessive spasm, and the potential risk of autonomic dysreflexia, in those with lesions above T6, should be routinely given.

MANAGEMENT OF ERECTILE DYSFUNCTION

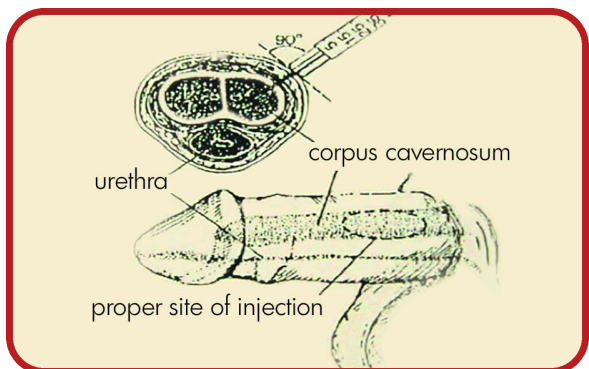
- Positioning to improve maintenance of erections.
- Constriction ring to maintain reflex erection
- Vacuum Tumescence Device and ring
 - technique is non-invasive
 - a "hinged erection" due to distal engorgement only
 - time consuming and decreased spontaneity
 - erection duration 20 mins
 - nil risk of priapism but some risk of circumferential pressure area
- **Oral Sildenafil (Viagra)**, efficacious in SCI

(In 78% of men with SCI the oral nitric oxide enhancing medication, Sildenafil (Viagra), is helpful). *Caution: use of Viagra in an individual susceptible to autonomic dysreflexia carries a concern because **Nitrates** (e.g. GTN spray) can not be used within 12-24 hours of the dose of **Viagra**.*

- 30-45 mins before effective
- contraindicated with use of nitrates
- erection duration approx 1-1.5 hours
- starting dose of 50mg in SCI patients
- rare reports of priapism
- cost prohibitive, (the medication is not yet on the PBS and costs in the region of \$70 per 4 tablets).
- Intracavernosal injection of vaso-active substances e.g. **Papaverine HCL, Prostaglandin E1, Alprostadil (Caverject)**.
 - technique is invasive (refer to figure 2)
 - full engorgement may be obtained on correct therapeutic dose
 - effective in approx 10mins
 - erection duration 1-1.5 hours
 - potential for prolonged erection (priapism)
 - cost will be prohibitive (August 2002)

Figure 2.

Diagram showing site of intracavernosal injection



TREATMENT OF PRIAPISM

- Increase peripheral vaso-dilatation
- 60mg oral pseudo-ephedrine
- Hot shower
- Exercise
- If no response in 1 hour proceed to medical detumescence

SEXUAL FUNCTION IN WOMEN WITH S.C.I.

- Minimal research previously which is now changing slowly
- Focus of spinal injured women is not just that of fertility potential
- Loss of genital sensation
- Lubrication problems
- Changes in arousal and orgasm

Sympathetic and parasympathetic fibres innervate the uterus (T10-12), fallopian tubes, ovaries and vaginal walls. Somatic innervation via the pudendal nerve provides afferent pathways from the clitoris and perineum. The labia and clitoris are also innervated through the autonomic nervous system and the responses are in the same configuration as in the male resulting in clitoral erection and vaginal lubrication leading to orgasm.

- Advice should be given about genital stimulation to achieve reflex lubrication and therefore possible appreciation of orgasm at least that above the lesion.
- Use of water-soluble lubricant may be helpful for intercourse.
- Positioning will also be important especially if spasm is significant.
- The risk of autonomic dysreflexia (lesions above T6) must be raised.
- Bladder management should be in keeping with improving sexual activity (eg, suprapubic catheter).
- Other considerations
 - Counselling
 - Development of 'new' erogenous zones above level of lesion
 - Encourage exploration and experimentation with a variety of techniques
 - Peer support may be useful

FERTILITY

The Woman

The reproductive capacity is only temporarily affected by SCI. Acute physical and psychological trauma usually causes cessation of menstruation for approximately 12 months. During the rehabilitation process methods of contraception will need to be considered:

- 'Normal' pattern returns
- Fertility is then unaffected
- Pregnancy poses some problems
- Oral contraceptives may be considered if there has been no D.V.T./PE. during the acute admission.
- I.U.C.D. is potentially hazardous due to lack of sensation ,particularly in tetraplegia where lack of hand function will prevent self checking of the device.
- Diaphragm partner may need to insert and check.
- Depo-provera may be very acceptable with the dual role of contraception and suppression of menstruation.

Hormone replacement therapy should be considered for the post menopausal SCI woman because of the heightened risk of osteoporosis etc.

Pregnancy is usually normal; however with SCI there is significant increase in complications:

- Bladder and kidney infections
- Thrombosis and leg oedema
- Difficulty in transfers
- Pressure sores
- Postural hypotension
- Autonomic Dysreflexia with uterine distension and contractions
- Premature labour (unrecognised)

The **labour** usually progresses to normal vaginal delivery (lift-out forceps may be required) but the first and possibly the only symptom of labour may be severe autonomic dysreflexia in those with lesions above T6. **Epidural anaesthesia** gives the best control of this significant problem.

Post partum concerns are with healing of the perineum and with inadequate breast feeding in those above T5 due to impaired "let-down" reflex. The care of the new-born will need special planning and assistance by use of equipment and/or a nanny.

The Man

The reproductive capacity following SCI is significantly impaired in men. Complete (UMN) lesions above T11 retain about a 5% chance of ejaculation. Complete (LMN) lesions below L2 retain only about 18% chance of emission.

Significant advances have been made in semen retrieval in recent years using the techniques of vibro-ejaculation and electro-ejaculation. Other methods that have been used to induce an ejaculate include intrathecal neostigmine (extreme risk of autonomic dysreflexia), subcutaneous physostigmine, direct aspiration of sperm from the vas deferens or epididymus and stimulation of the hypogastric nerve.

VIBRO-EJACULATION

Reflex ejaculation can be achieved in 59% of SCI men (Linsensmeyer et al, 1991) by applying a large amplitude vibrator ("Matoba", "Thrive" or "Ferti Care", Figure 3) to the ventral surface of the glans using a frequency of around 80 Hz for 3 minutes and after a 1-2 min. pause may be repeated twice. There is accompanying rise in blood pressure in those with SCI above T6 and at times to an alarming level in spite of prophylactic vasodilators such as Nifedipine 10-30 mg. First attempts should be in a Health-Care setting and before patients are encouraged to use this device at home, a thorough understanding of the management and treatment of autonomic dysreflexia must be accomplished.

Figure 3
Ferti Care Vibrator



ELECTRO-EJACULATION

Emission of semen can be achieved in 85% of SCI men (Linsensmeyer et al, 1991) by electrical stimulation using a trans-rectal probe (Fig.4) over the sympathetic nerve supply in the region of the seminal vesicles. At Royal North Shore Hospital the frequency used may vary between 10-50Hz and the voltage is systematically increased in short cycles (15-45 sec.) until an antegrade emission is achieved or 3 stimulations have been given. To prevent retrograde emission an all-silicone 12Fg catheter is passed into the bladder prior to the stimulation and the bladder neck is tamponaded by applying gentle traction on the catheter with 10ml. in a 5ml. balloon (Fig.5). Prophylactic Nifedipine 10-30mg. is also used for those with lesions above T6 to reduce the degree of autonomic dysreflexia that occurs.

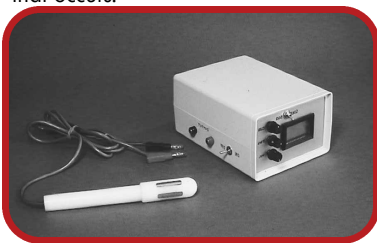


Figure 4.
Electro ejaculation stimulator and probe

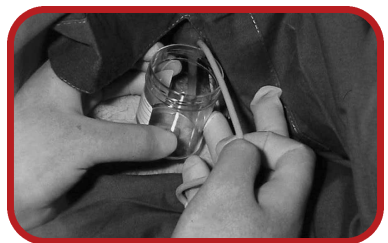


Figure 5.
Semen retrieval using bladder neck tamponade

TABLE 1: COMPARISON OF TECHNIQUES

	ADVANTAGES	DISADVANTAGES
VIBROEJACULATION	<ul style="list-style-type: none">• At home or hospital• Cheaper• Suitable for higher lesions (C1-T9)• More frequent use	<ul style="list-style-type: none">• Autonomic dysreflexia more severe• Not suitable for lower lesions (below T9)
ELECTROEJACULATION	<ul style="list-style-type: none">• Autonomic dysreflexia more controllable• Suitable for lower lesions (T10-S) as well as (C1-T9)	<ul style="list-style-type: none">• At hospital only• More staff required• Risk of rectal mucosal burning

Additional Semen Retrieval Techniques

- Testicular biopsy
- Epididymal stimulation
- Epididymal aspiration

Semen quality however is a significant cause of infertility in SCI men. The semen obtained by either of the two retrieval techniques shows high total sperm count (commonly >100 million/ml) but with very poor motility (usually <10%). Semen quality deteriorates rapidly following injury.

Sperm Factors contributing to **poor semen quality** include:

- Absence of regular ejaculation
- High pressure bladder function (reflux of urine into genital tract)
- Stasis of prostatic fluid
- Testicular hyperthermia
- Recurrent urinary tract infections
- Possible changes in the hypothalamic- pituitary-testicular axis
- Chronic use of various medication.

Achieving Pregnancy

- Artificial Insemination not usually successful
- Intrauterine Insemination minimal success
- IVF procedure (ICSI) greatest success

I.V.F. procedures offer significant hope for improved reproductive capacity. The technique of I.C.S.I. (intra-cytoplasmic sperm injection) means now that only one live sperm (even with little or no motility) is required to fertilize each ovum in the laboratory setting.

A plan for assisted reproduction can now be offered to many men with SCI and we are likely to see significant improvement in this outcome. Attention to bladder function by avoiding reflux of urine into the genital tract will improve reproductive outcomes (Rutkowski et al., 1995).

Evidence of one's fertility has shown to be a positive psychological outcome in rehabilitation following SCI. This was a finding in a study carried out at Royal North Shore Hospital Spinal Injuries Unit in couples enrolled for assisted reproduction. There was however the finding of significant stress reported by the partners who were necessarily undergoing the IVF hormonal treatments.

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CONTRIBUTORS

Dr James Middleton, Medical Director, Moorong Spinal Unit,
Royal Rehabilitation Centre, Sydney

Dr Stella Engel, Clinical Program Director, Rehabilitation & Spinal Medicine,
The Princes Henry & Prince of Wales Hospitals

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Debbie Hagen, CNC Spinal Injuries Unit, Royal North Shore Hospital
Glen Stolzenhein, CNC Spinal Injuries Unit, The Prince Henry & Prince of
Wales Hospitals.

Dr Jane Watt, LMO, Armidale

RURAL SPINAL CORD INJURY PROJECT

Project Officer:

Nickie Flambouras

PO Box 63 Auburn 2144 Tel: (02) 9637 9069

