Primary Health Care in Women With SCI

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I HAVE NO CONFLICT OF INTERESTS
Epidemiology

- Annual incidence US 56 cases/million (12,500 cases/year)
- Bimodal — young adults (16-30) and older (>65 years old)
- Males - 70-80%
- Cause: transportation crashes, falls, violence and sports
Spinal pathology—Mechanism

- **Traumatic SCI**
  - Cervical spine flexion and hyperextension injuries
  - Cervical, thoracolumbar fractures (burst fractures)

- **Non-traumatic SCI**
  - Spinal stenosis with myelopathy
  - Cord compression from a neoplasm
  - MS
  - Transverse myelitis
  - Infection (epidural abscess)
  - Vascular ischemia
  - Radiation myelopathy
  - Motor neuron disease
  - Syringomyelia
ISNCSCI Exam

• Neurologic Level of Injury
  C, T, L, S

• Incomplete vs Complete
  A-E
Medical Complications of SCI

Multiple organ involvement

WHOLE PERSON INVOLVED
Autonomic dysfunction—orthostatic hypotension

• Injuries above T6 put an individual at risk
• Caused by decrease/lack of sympathetic outflow in response to change in position

• Management
  • Compression stockings
  • Abdominal binder
  • Repositioning
  • Fluids/hydration
  • Medications
    • Midodrine
    • Fludrocortisone
    • Salt tabs?
Autonomic Dysfunction - Autonomic Dysreflexia

• SCI at or above T6

• Symptoms
  • Headache
  • Sweating/flushing above the level
  • Elevated BP
  • Piloerection
  • Pupillary constriction
  • Sinus congestion

1. Afferent stimuli caudal to injury
2. Hyper-excitation of sympathetic neurons caudal to injury
3. Constriction of splanchnic/leg vasculature and systemic hypertension
4. Reduced supraspinal activation of sympathetic neurons due to baroreflex loading
5. Reduced excitation of sympathetic neurons rostral to injury
6. Inappropriate cerebrovascular response to hypertension
Autonomic Dysfunction-Autonomic Dysreflexia

- Causes—noxious stimulus below the level of injury
  - Bladder—UTI, overloaded, blocked catheter
  - Bowel-fecal impaction
  - Acute abdomen-appendix, cholecystitis, pancreatitis
  - Pressure ulcers
  - Fractures
  - Ingrown toe-nails
  - Bladder stones
  - Gastric ulcers
  - Others…
Autonomic dysreflexia

• Management
  • Sit patient upright, loosen tight fitting clothes and devices (Juzos, Abdominal Binder, etc)
  • ID and remove noxious stimuli
  • Medications should be started if BP is >150 and source cannot be found/addressed
    • Nitropaste
    • Hydralazine
    • Clonidine

• Complications
  • Retinal Hemorrhage
  • CVA
  • SAH
  • Seizure
  • MI
  • DEATH
Other CV issues to consider in aging

- Metabolic Syndrome
  - Diabetes
  - Hypertension
  - Cardiovascular Disease
- Peripheral Vascular Disease
Bladder – reflexic vs areflexic

Reflexic
• Lesions above conus - sacral micturition center
• Detrusor hyperreflexia high pressures
• Failure to store/empty urine
• Detrusor – sphincter dyssynergia
• Treatment:
  • ISC
  • Anticholinergics (Ditropan, Detrol),
    alpha blockers
  • Botox

Areflexic
• Lesions at conus & below - below sacral micturition center (S2-S4)
• Detrusor flaccid
• Sphincter flaccid
• Overflow incontinence
• Tx: ISC
a LUT innervation in the absence of SCI

b LUT innervation in patients with SCI above the level of the conus medullaris

Possibility of NDO

Possible loss of synergy between detrusor and sphincter (DSD)

Spinal cord lesion below or at the level of the sacrum

Spinal cord lesion above or at the level of the sacrum

Possibility of detrusor areflexia resulting in urinary retention

Possibility of incontinence owing to loss of urethral resistance
Bladder Dysfunction– management/ cxs

PRIMARY GOAL -

• Keep detrusor pressures safe
  • Intermittent catheterization
    • ISC volumes <500 mL
    • Frequency: q4-6 hrs
  • Medication management

• Other side effects
  • Renal failure due to VUR
  • Bladder stones
  • Bladder cancer

• UTIs—
  • Treat only if symptomatic
  • Asymptomatic bacteria - common
    • Significant bacteria (>10K CFU), pyuria (>10 WBCs), fever, malaise, increased spasticity, neurogenic pain, AD
Bowel Dysfunction—reflexic vs areflexic

• Reflexic
  • Lesion above the conus medullaris
  • Symp & Parasymp Loss- transverse and descending colon
    → decreased fecal movement
    → fecal impaction, constipation
  • Somatic loss - external anal
  • Reflex arcs spinal cord- colon - Auerbach’s plexus intact → initiate stool movement and elimination

• Areflexic
  • Lesion at the conus or below
  • No reflex arcs intact
  • Slowed colonic transit with overflow incontinence.
  • External anal sphincter is flaccid
A spinal cord injury above T12 would typically result in a Reflex Bowel.

Bowel type determined by injury level

A spinal cord injury below T12 would typically result in a Flaccid Bowel
Goals of the Bowel Program

- DAILY or at least QOD, 3 x per week
- complete (>2cups) emptying of stools per bowel movement
- No episodes of incontinence
- Stool consistency: soft but formed (Bristol Stool Type 4-5)
- Less than one hour – ideally 30 min
Bowel Meds to optimize MOTILITY and STOOL EVACUATION

• ORAL MEDICATIONS
  • Stimulants
  • Absorbants/Osmotics
  • Fiber

• RECTAL MEDICATIONS
  • Suppositories
  • Enemas

1. Optimize stool consistency
2. Intestinal stimulation
3. Increase fluid in intestinal lumen
4. Triggering defecation at regular intervals (DAILY OR every other day)

MEDICATIONS MUST BE INDIVIDUALIZED. THE RIGHT COMBINATION OF MEDICATIONS WILL REQUIRE TRIAL AND ERROR.
Pulmonary Complications

• Most common in high cervical injuries (C1-C4) → respiratory failure

• Loss of innervation to some or all respiratory ms
  • Loss of ability to cough—loss of abdominal muscles

• Secretion mgmt
  • Cough assist
  • Suctioning
  • Chest PT

• O2/CO2
Osteoporosis

- begins immediately – detected six weeks after injury
- two years after injury – BMD = 70yoF
- trabecular bone - distal femur, prox knee
- worse in complete SCI
- worse longer duration of SCI
- Tx: maintain bone – Vit D, Ca
- testosterone effective for men **
  - Bisphosphonates – low evidence; only +fracture
  - Wt bearing – not effective
  - Newer agents promising?
Heterotopic Ossification

• Bone formation in soft tissue around a joint (hip>knee>shoulder>elbow)
• swelling, decreased ROM, joint
• Dx—bone scan, X-ray, CRP, ESR
• Tx—ROM, etidronate, NSAIDs
  • +/- surgery, radiation therapy
Venous Thromboembolism

- 47-100% w/o prophylaxis; 14% w/ prophylaxis
  - neurologically complete
  - tetraplegia
- first two weeks post SCI
- decreases after 8-12 weeks post-SCI
- Chemoprophylaxis - LMWH
  - at least 12 weeks
- Tx - heparin or LMWH → PO meds
  - proximal DVT- 6 months
- PE is the leading cause of death in ACUTE SCI
Pain

• Nociceptive Pain
  • MSK overuse injuries
  • Visceral pain- altered

• Neuropathic Pain
  • 60-70% of patients
  • Not related to level of injury or severity of injury.

• Spasticity/Spasms
  • contributes to pain
Pressure ulcers

- Local soft tissue damage due to prolonged pressure over bony prominences
- Sacral - initial 2 years
- Ischial Tuberosities - 2 years post
- Prevention
  - Frequent repositioning (q2hrs)
  - Pressure relief (weight shifting) while sitting every 20-30 minutes, tilt in space
  - Pressure relieving mattress
## Functional Outcomes

C6 complete tetraplegia
- live independently - high level of skills (may still require some assistance with certain tasks)

- Realistically C7

### TABLE 7.3. Functional Potential Outcomes for Cervical SCI (Complete Patients) (Kirschblum, 1998)

<table>
<thead>
<tr>
<th></th>
<th>C3–C4</th>
<th>C5</th>
<th>C6</th>
<th>C7</th>
<th>C8–T1</th>
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</thead>
<tbody>
<tr>
<td><strong>Feeding</strong></td>
<td></td>
<td></td>
<td>Independent with equipment</td>
<td>Independent</td>
<td>Independent</td>
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<tr>
<td></td>
<td>May be able with adapted equipment</td>
<td>*BFO Independent with equipment after set up</td>
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<tr>
<td><strong>Grooming</strong></td>
<td></td>
<td></td>
<td>Independent with equipment after set up</td>
<td>Independent</td>
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<td></td>
<td>Dependent</td>
<td>Requires assistance</td>
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<tr>
<td><strong>UE Dressing</strong></td>
<td></td>
<td></td>
<td>Independent with equipment</td>
<td>Independent</td>
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<td></td>
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<tr>
<td><strong>LE Dressing</strong></td>
<td></td>
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<td>Independent with equipment</td>
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<td>Dependent</td>
<td>Requires assistance</td>
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<tr>
<td><strong>Bathing</strong></td>
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<td>Independent with equipment</td>
<td>Independent</td>
<td>Independent</td>
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<tr>
<td><strong>Bed Mobility</strong></td>
<td></td>
<td></td>
<td>Requires assistance</td>
<td>Independent</td>
<td>Independent</td>
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<tr>
<td></td>
<td>Dependent</td>
<td>Requires assistance</td>
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<tr>
<td><strong>Weight Shifts</strong></td>
<td></td>
<td></td>
<td>Independent</td>
<td>Independent</td>
<td>Independent</td>
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<tr>
<td></td>
<td>Independent with power</td>
<td>Requires assistance</td>
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<tr>
<td><strong>Transfers</strong></td>
<td></td>
<td></td>
<td>Independent with transfer board</td>
<td>Independent</td>
<td>Independent</td>
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<tr>
<td></td>
<td>Dependent</td>
<td>Requires assistance</td>
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<tr>
<td><strong>W/C Propulsion</strong></td>
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<td>Independent manual with transfer board</td>
<td>Independent</td>
<td>Independent</td>
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<td></td>
<td>Independent with power</td>
<td>Requires assistance</td>
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<tr>
<td><strong>Driving</strong></td>
<td></td>
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<td>Car with hand controls or adapted van</td>
<td>Car with hand controls or adapted van</td>
<td>Car with hand controls or adapted van</td>
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<td></td>
<td>Unable</td>
<td>Unable</td>
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<tr>
<td><strong>Bowel and Bladder</strong></td>
<td>Dependent</td>
<td>Dependent</td>
<td>Independent—bowel assists-bladder</td>
<td>Independent</td>
<td>Independent</td>
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</tbody>
</table>
SPECIFIC ISSUES RELATED TO WOMEN WITH SCI
Sexual and Reproductive Issues in Women With SCI
Sexuality After Spinal Cord Injury

Five major publications since 2004 rank sexuality following SCI to be the highest (1st, 2nd) priority for individuals living with SCI.
Common Sexual Problems for Women After SCI

- **Libido**  
  - *may* be a drop in sexual desire
- **Arousal difficulties (vaginal lubrication and accommodation)**  
  - sense of subjective genital arousal may or may not be present
- **Orgasmic difficulties**  
  - especially with lack of sensation or pain interference
- **Fertility concerns**  
  - contraception may be an issue  
  - pregnancy may be higher risk  
  - some vigilance required with labor, delivery, and breastfeeding
Common Sexual Problems for Women With SCI

Genital Arousal Dependence

- Genital arousal (vaginal lubrication) may be psychogenic (esp if T11 – L1 sensation intact) and/or reflexogenic (sacral reflex intact)
- Those with some genital sensation have an improved sense of subjective arousal
- The use of water soluble, non-flavored/warming/colored lubricants can be helpful if lubrication impeded

*Papers Marca Sipski, Beverly Whipple, Cindy Meston, Kim Anderson
Common Sexual Problems for Women With SCI

ORGASMIC DIFFICULTIES

- approximately 50% may experience orgasm (but ↑ time)
- genital orgasm: incomplete injuries > complete
  - complete S2-5 injuries (17%) compared to 59% of all other levels/degrees (Sipski et al. Ann Neurol. 2001.)
- Orgasm more likely with time, trusted partner, vibrator use*

Non-genital orgasm may be possible with neuroplasticity

SCI-Specific Female Problems Associated w/ Sex

- Lack of lubrication 23%
- Lack of enjoyment 45%
- Difficulty with **positioning** 42%
- Increased **spasticity** 26%
- **Autonomic dysreflexia** 11%
- Problems with Foley catheter 7%
- **Bladder** incontinence 17%

When it comes to sex and spinal cord injury, we're all about kissing and telling.
Fertility for Women With SCI

Immediately following injury, amenorrhea may occur, lasting on average 4-6 (up to 12) months…but fertility is mostly unaffected!

Birth control > fertility issue

Choice of contraception dependent upon:

- hand function
- self-care potential
- concomitant brain injur
- E2 (↓) and P (↑) risks
- preference

Almost ¾ of women after SCI practice birth control
Pregnancy Risk and Complications

- **Bladder**: ↑UTI (up to 30%), P=bladder leakage, ↑pyelonephritis, change movement
- **Respiratory**: ↓diaphragm movement ↑pneumonia risk, respiratory compromise (esp quads)
- **Pedal edema**: ↑ but no apparent increase risk for DVT
- **Bowel**: progestin ↑ and Fe suppl = delayed emptying
- **Skin**: ↑ breakdown (up to 90%)
- **Mobility**: ∆CoB and ↑ spasm = transfer difficulties
- **Fatigue**: worsens, increased AD in some, medication review, or alteration
- **Loss of pre-pregnancy independence**

Jackson, AB Women’s Health Issues Ch 34 SCI Medicine, 2nd edition, Vernon Lin et al Demos Medical Publishing 2010 pg 438-457
Labor Issues

• Labor may present as:
  – Back pain (referred)
  – ↑ spasticity
  – ↑ bladder spasm
  – abnormal non-specific pain
  – onset of AD

• Premature cervical dilation and preterm labor more common in women with SCI
• Level of lesion determines ability to recognize labor or assist with pushing
  (T10 – L1): ¼ cannot
• Cervical dilation/perineal stretching pain (S2-4)?

  Need earlier monitoring > 28 weeks

Delivery Issues

• Need multidisciplinary team to do continuous hemodynamic monitoring and to reposition every 2 hours to avoid skin issues

• MOST women with SCI have successful vaginal deliveries, but C/S, vacuum, and forceps extraction ↑

Key: Distinguish pre-eclampsia from autonomic dysreflexia (may need epidural) and may have both-correct evaluation critical

Postpartum Issues - [http://sciparenting.com](http://sciparenting.com)

- Breastfeeding difficulties (esp SCI above T4)
- Post-partum depression (under diagnosed)*
- Difficulties with lifting, transferring, shoulder health
- Fatigue
- Infant assistance
- Support persons/caregivers for mom and baby

Positioning: Other Options Used

- Transfer into an arm chair/lazy boy chair
- Football hold

https://www.babycenter.com/0_positions-and-tips-for-making-breastfeeding-work_8784.bc

https://assets.babycenter.com/ims/2013/04/86535325_wide.jpg?width=600

PHYSICAL MEDICINE & REHABILITATION
Aids: Wedges

• Provide support for sitting upright in bed
• Provide leg supports to reduce spasms
• Improve hypotension

https://www.newmaticmedical.com/patient-positioning/p/WedgePositioners/

https://mynecksprain.com/best-pillows-for-neck-and-back-support/
Modifications to wheelchair
Manuals
Dr. Mitch Tepper.com is an internet site on sexuality and pleasure pertaining to men and women with paralysis or disability. Operated by Mitch Tepper, Ph.D., a sexuality counselor who is quadriplegic. See http://www.drmitchelltepper.com
Disability & the Art of Kissing
Questions and Answers on the True Nature of Intimacy
Gary Karp

Sexual Sustainability
Your guide to having a great sex life with a spinal cord disorder
Marcalee Alexander M.D.
Changes in CV Control in Women With SCI
Blood Pressure and Pregnancy in Healthy Women

Preeclampsia is a condition of pregnancy characterized by high blood pressure (hypertension).

Preeclampsia usually occurs after the 34th week of gestation.

Preeclampsia and eclampsia develop most commonly during the first pregnancy.
Compression of Abdominal Contents as Uterus Enlarges

0 weeks 20 weeks 38 weeks
Pregnancy and Supine Hypotension Syndrome

- Pressure from enlarged uterus decreases venous return from lower extremities
- Stagnation of blood in lower extremities
- Hypotension, dizziness, diaphoresis, pallor
- Orthostatic hypotension
Blood pressure and pregnancy in SCI
AD during pregnancy: case

• 24 hr BP monitoring in 33 wk pregnant woman
  • Highest BP = 159/106 mmHg
  • Lowest BP = 83/43
CLINICAL ALGORITHM
By Dr A Mclain

Autonomic Dysreflexia vs Pre-eclampsia in SCI
AD and breastfeeding

- Women with SCI completed a survey on lactation after pregnancy (J Hum Lact 20**)

<table>
<thead>
<tr>
<th></th>
<th>Cervical (C1-C8)</th>
<th>Upper Thoracic (T1-T6)</th>
<th>Lower Level (&lt; T7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autonomic Dysreflexia</td>
<td>47%</td>
<td>25%</td>
<td>13%</td>
</tr>
</tbody>
</table>

Conclusions

• Pregnancy – triggered by inc in UTI, spasms, uterine pressure on venous return, pre term contractions

• Labour – can present as onset of AD – occurs even if no prior AD hx, can interfere with uterine/placental blood flow (fetal monitoring)

- must distinguish from pre-eclampsia
Conclusions

• Delivery – AD can be triggered by episiotomy

• Postpartum- exacerbations of AD are common, bowel and bladder distention, post op pain, breast distention, mastitis and breastfeeding (38.8%)
QUESTIONS??