Primary Care Providers and Chronic Spinal Cord Injury: What Patients’ PCP’s need to Know

Paralyzed Veterans of America
August 2012
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Learning objectives

• Explain mechanisms in which spinal cord injury can alter the presenting signs and symptoms of common medical conditions seen in primary care

• Identify educational opportunities for primary care providers in the care of chronic spinal cord injured patients

• Describe resources that can enhance primary care for patients with chronic spinal cord injury
Why do we need to know this?

• Internists and Family Practitioners are familiar with medical diseases, but not the altered presentations caused by SCI

• Neurologists are familiar with the neurologic alterations, but not the medical diseases

• Specialists know their “stuff” and but are rightfully uncomfortable managing primary care issues

• Patients just want their needs addressed but man not know what they need or where to get help
Obtaining CME/CE credit

If you would like to receive continuing education credit for this activity, please visit:

http://www.pesgce.com/PVA2012
Why don’t PCP’s know how to handle Chronic Spinal Cord Injury?

AccessMedicine Online

- “spinal cord injury”
  - 44 entries
  - mostly in Emergency Medicine, Trauma Surgery, and Neuroimaging Texts
  - One in Oncology Text

- “autonomic dysreflexia”
  - 7 entries
  - Emergency Medicine
  - Urology
  - Pediatrics
  - Orthopedics
  - Critical Care

- 167 words in “Harrisons”

Search date Sept 2011

Primary Care and SCI HKJorn, MD

PVA Las Vegas 2012
Where primary care physicians learn “what’s new”

- New England Journal of Medicine
  - “Spinal Cord Injury”
    - Multiple articles on stem cells

- American Family Practice
  - Nothing on chronic SCI/D
    - 1/184 on spinal cord emergencies
  - Conditions concurrent with SCI mentioned
One PCP Experience

- Academic Medical Center
  - Non-trauma center, regional referral for organ transplantation, cancer, and tertiary care
  - 600 patients (half-time panel) in primary care
  - 3 patients with spinal cord dysfunction
    - All medical illnesses, gradually progressive
    - Never been to inpatient rehabilitation
  - 500 patients over age 65
  - 400 with diabetes, HTN, CAD, stroke etc.
Why don’t PCP’s know about SCI?

- Institutional policy against detailing
- Small offices and practices not “targeted” by manufacturers or detailers
- Lack of publications in typical journals
  - SCI authors “preaching to the choir”
- Medical meetings products and services not well represented
  - PVA at the American College of Physicians?
Hospital Duty with Residents July 2012

- 66yo man admitted with fever to 104, “knew he was getting UTI”
  - Paraplegia not mentioned till halfway through presentation
  - Rationale for self catheterization not understood by care providers
  - Providers wary of patient having antibiotics for UTI “on hand”
Hospital Duty July 2012

• 77yo man transferred to our hospital after being diagnosed with atraumatic paraplegia
  • ER visit X 2 elsewhere for back pain
  • After 2nd visit, patient unable to move legs but laid in bed 4 days because “didn’t have transportation”, back to ER
  • Once at ER, disk infection, unable to move his legs, and renal failure from rhabdomyolysis
Questions for my team:

• Ever heard of autonomic dysreflexia?

• How does the level and completeness of SCI affect the way medical conditions present?

• Is self catheterizing a good way to manage bladder drainage in SCI?

• How would you know what you don’t know about SCI and medical illness?
Primary Care Providers and Chronic Spinal Cord Injury: What Patients’ PCP’s and Hospital Providers Need to Know and how you can help them

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Overview

- Autonomic Dysreflexia
- Pulmonary Conditions
- Cardiovascular Conditions and Stroke
- GI and GU conditions
- Musculoskeletal conditions and pressure sores
- Endocrine/Diabetes
- Sexuality, fertility, and pregnancy
- Age and SCI
- Adjustment
Demographics of chronic spinal cord injury (SCI)

- About 10,000 spinal cord injuries in United States each year
  - Peak ages 16-30, 2nd peak >60yo
  - Children under 15 3-5%
- Trauma (MVA, gunshot, falls)
- Increasing non-traumatic causes
- 94% SCI patients return to community (not in nursing home)
Demographics of SCI

- Life expectancy about 90% of non-SCI population
  - Increased survival for female, younger age at injury, incomplete and lower level injuries
- Overall causes of death
  - Respiratory infections, accidents and suicide, heart disease, GI disease, thrombosis/embolism
Sections

- Autonomic Dysreflexia
- Pulmonary Conditions
- Cardiovascular Conditions and Stroke
- GI and GU conditions
- Musculoskeletal conditions and pressure sores
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Autonomic dysreflexia

• Life threatening rise in blood pressure
  • Pulse usually bradycardic as carotid sinus receptors and vagus attempt to compensate
• Baseline blood pressure 90-110mmHg for many SCI patients, 20 point elevation is significant
• Stroke is most feared effect
• Headache, pallor below with flushing above the level of injury, sweating, “feeling of doom”
• Pregnancy is special category: preeclampsia/eclampsia vs. autonomic dysreflexia; chose of treatments
Autonomic hyper/dysreflexia

• Uninhibited/exaggerated sympathetic responses to stimuli (usually noxious) below the level of injury in patients with lesions T6 or higher
  • T6 and lower level injuries allow compensatory dilatation splanchnic bed

• Pain signal goes up, stimulates the heart/blood pressure but the brain can’t tell the system to settle down
Without Spinal Cord Injury/Dysfunction
Normal reflex pathways
T6 injury or higher: Autonomic Dysreflexia
Spinal Cord Injury below T6: Unlikely to get Autonomic Dysreflexia
Autonomic dysreflexia

- Most common triggers
  - Bladder or bowel distension
  - Tight clothing, pressure ulcer
  - Infection (UTI usually)
  - Acute Abdomen
  - Ingrown toenails or other “minor” skin problem
  - DVT (acute injury stage usually)
  - Sexual activity
  - Uterine contractions

Acute care hospitalists and PCP’s often unaware of AD as a potential problem for traumatic SCI or especially for non-traumatic SCI.
Autonomic Dysreflexia
Initial Treatment

• Remove the stimulus for AD
  • Supine, head elevated 30-45°, lower legs
  • Remove tight or restrictive clothing
  • Quick head-to-toe exam for unrecognized injury, skin lesion
  • Monitor BP every 2-5 minutes till stabilized
  • Reposition/un-kink bladder catheter
  • Lidocaine jelly before rectal exam and/or placement/reposition of bladder catheter

• Patients/caregivers can be familiar with the syndrome and can advise you on measures to help
Autonomic Dysreflexia
Medications for Treatment

• Nifedipine and nitrates most commonly advised
  • Nifedipine bite-and-swallow (really!)
  • “A review of the literature from 1966 through December 2000 reveals that there have been no reported adverse effects from the use of nifedipine when used to treat autonomic dysreflexia.” (PVA AD Practice Guidelines, published 2001, downloaded 2012)
  • 2009 Meta-Analysis AUTONOMIC DYSREFLEXIA AFTER SPINAL CORD INJURY (Krassioukov, et al)

• Nitrates
  • Topical 1 inch applied above level of lesion
  • IV nitroglycerin
  • Many SCI men use sildenafil or other PDE-I’s
    • NO NITRATES FOR THEM

• Hydralazine, nitroprusside, ACE-I intravenously
Autonomic dysreflexia
Medications for Treatment

- Refractory cases may respond to spinal anesthesia
- Some authors propose use of nifedipine to prevent onset of dysreflexia for predictable or unavoidable episodes (bowel care, catheter placement, intercourse, etc.)
Autonomic Dysreflexia

• Educate your patients if they are at risk
• Wallet cards or other ways to educate
• Feel OK to hand the staff a card
  • “Many doctors [nurses, therapists, etc] are not familiar with autonomic dysreflexia. I give a copy of this card to all my new doctors.”
Autonomic Dysreflexia

**Signs and Symptoms of Autonomic Dysreflexia**
- Increased blood pressure
- Severe pounding headache
- Flush and sweating above the level of the SCI
- Pallor and gooseflesh below the level of the SCI
- Anxiety
- Bronchospasms or respiratory distress
- Cardiac irregularities

**Treatment of Autonomic Dysreflexia**
- My Normal BP = [Blank]
- Assess for other possible causes of hypotension.
- Check for spinal cord injury and ejection fraction.
- If above is diagnosed, obtain rapid and aggressive fluid.
- Elevate the patient in an upright position.
- If any of the signs or symptoms appear, follow the steps above.
Autonomic Dysreflexia

Autonomic Dysreflexia (AD) is a potentially life-threatening condition that can be considered a medical emergency. It mainly affects people with injuries at T6 or higher.

AD requires quick and correct action. Serious AD can lead to a stroke. Because many health professionals are not familiar with this condition it is important for people who are at risk for AD and the people close to them to learn about it.

- Request a FREE Autonomic Dysreflexia wallet card
- Email to a friend an Autonomic Dysreflexia wallet card
- Download a fact sheet about Autonomic Dysreflexia
- Read about a real-life experience with Autonomic Dysreflexia

Find Resources in Your Area
Check out programs in your area on our one-of-a-kind online searchable Quality of Life program database. You can search by location or topic. Go
Autonomic Dysreflexia Card

**ATTENTION PHYSICIAN**

The following are treatment recommendations which can be used for adults with Autonomic Dysreflexia (AD).

- Sit patient upright (90 degrees).
- Monitor BP every 2-3 min.
- Quick exam to include abdomen for distended bladder/rectum and any other organ system below the level of injury that can be the source of dysreflexia.
- If an indwelling urinary catheter is not in place, catheterize the individual. If indwelling catheter is in place, check system for kinks, foils, constrictions, or obstructions.
- If systolic BP >150, give an antihypertensive with rapid onset and short duration while causes of AD are being investigated.
- Nitro Paste—1”, apply every 30 min, topically above level of injury, wipe of when BP stable, reapply as needed. Hold if patient has taken PDE5 inhibitors (i.e. Viagra, Cialis, etc.) within 24 hours.
- Nifedipine IR (if no Nitro paste available)—10mg per dose, sublingual form or chewed, may repeat every 20-30 min as needed.
- IV Antihypertensives—only in a monitored setting (I.C.U.).
- Monitor symptoms and BP for at least 2 hrs after the resolution of an AD episode.
- AD can lead to seizures, stroke, or death!

**MEDICAL HISTORY**

Baseline Blood Pressure:

Neurological Location of Injury:

Primary Healthcare Provider:

Phone Number:

Allergies:

**EMERGENCY CONTACT**

In Case of Emergency Call:

Relationship:

Phone Number:

Produced by the Christopher & Dana Reeve Foundation through a cooperative agreement with the Centers for Disease Control and Prevention award no. 1U59DD000850-01.

**WHAT IT IS:**

Autonomic Dysreflexia (AD) is a sudden increase in blood pressure, 20-40 mm Hg systolic higher than usual, resulting from harmful, painful, or injurious stimuli applied below neurologic levels in persons with a spinal cord injury (SCI). This condition, which is caused by massive unopposed sympathetic discharge, occurs primarily in those with an injury above the thoracic T6 level. If left untreated, it can lead to a stroke, seizures, or even death.

**Autonomic Dysreflexia is a medical emergency.**

**COMMON CAUSES:**

- Distended bladder
- Constipated bowel
- Pressure ulcers
- Fractured bones
- Skin burns
- Urinary tract infections
- Ingrown toenails
- Any condition or procedures that may cause pain or discomfort but is located below neurologic injury level.
Sections

- Autonomic Dysreflexia
- **Pulmonary Conditions**
- Cardiovascular Conditions and Stroke
- GI and GU conditions
- Musculoskeletal conditions and pressure sores
- Endocrine/Diabetes
- Sexuality, fertility, and pregnancy
- Age and SCI
- Adjustment
Pulmonary Conditions

- Pneumonia one leading cause of death
  - Impaired cough
    - Assisted coughing very useful when performed by caregiver
    - “Machines” tested to do this, not practical at this time
  - Aspiration pneumonia considered
- Respiratory muscle weakness
  - “Training” programs for breathing meeting w/mixed results
Pulmonary Conditions

- Vaccination for pneumococcal pneumonia, influenza, Tdap (pertussis)
- Teach patient/caregiver assisted coughing
  - Timed “Heimlich maneuver”
- Postural drainage, chest physiotherapy helpful in some cases
- Obstructive Sleep Apnea
  - Neck circumference for quadriplegics
  - Obesity
  - Positional issues (side vs. back)
Pulmonary Conditions: Ventilator Dependency

- High cervical lesions require ventilatory support
  - 24h vs. nighttime only, vs. when ill or weak
  - Home/mobile ventilators increasingly available but labor intensive
  - All of the risks associated with mechanical ventilation

- Glossopharyngeal breathing
  - Emergency technique
COPD (Chronic Obstructive Pulmonary Disease)

• “Chronic obstructive pulmonary disease (COPD) is a preventable and treatable disease …. Its pulmonary component is characterized by airflow limitation that is not fully reversible. The airflow limitation is usually progressive and associated with an abnormal inflammatory response of the lungs to noxious particles or gases.“
  • World Health Organization/GOLD Criteria
• Chronic Bronchitis
• Emphysema
COPD

• Chronic respiratory complaints
  • Cough, dyspnea on exertion, fatigue

• Acute onset during exacerbation
  • Wheezing, cough, dyspnea, purulent sputum

• Prevalence??
  • Dr. DeVivo’s Respiratory Diseases leading cause of death (primary + secondary) = 26%
COPD and SCI

- Tetraplegia and perception of dyspnea
- Inability to recruit accessory muscles
  - Leaning forward on arms
- In VA studies, visit for acute respiratory illness significantly associated with increased risk of respiratory related hospitalization and death 60 days later
  - 2008 Stolzmann, 2006 Weaver
- Trend toward increasing respiratory illness with age not as expected, possibly due to survivor effect (in those not on ventilator) several years after injury
  - 2008 Stolzmann
COPD and SCI

[Image: Standards for the Diagnosis and Management of Patients with COPD]

- Clinical Presentation
  - At Risk
  - Symptomatic
  - Exacerbations
  - Respiratory Failure

- Interventions
  - Smoking Cessation
  - Disease Management
  - Pulmonary Rehabilitation
  - Other Options

- FEV1
- Symptoms

Disease Progression
COPD and SCI

Opening the HandiHaler device and inserting the SPIRIVA capsule.

1) OPEN: Open the dust cap by pulling it upwards. Then open the mouthpiece. (Figure 1)

2) INSERT: Place the capsule in the center chamber. It does not matter which end of the capsule is placed in the chamber. (Figure 2)

3) Close the mouthpiece firmly until you hear a click, leaving the dust cap open. (Figure 3)

Taking your dose of SPIRIVA.

4) PRESS: Hold the HandiHaler device with the mouthpiece upwards and press the piercing button completely in once, and release. This makes holes in the capsule and allows the medication to be released when you breathe in. (Figure 4)

5) Breathe out completely. (Figure 5)
   Important: Do not breathe (exhale) into the HandiHaler mouthpiece at any time.

6) INHALE: Raise the HandiHaler device to your mouth and close your lips tightly around the mouthpiece. Keep your head in an upright position and breathe in slowly and deeply but at a rate sufficient to hear the capsule vibrate. Breathe in until your lungs are full, then hold your breath as long as is comfortable and at the same time take the HandiHaler device out of your mouth. Resume normal breathing. (Figure 6)

To ensure you get the full dose of SPIRIVA, you must repeat steps 5 and 6 once again.
If you do not hear the capsule vibrate after repeating the above steps please consult your physician.

7) After you have finished taking your daily dose of SPIRIVA, open the mouthpiece again. Tip out the used capsule and discard. (Figure 7)

Close the mouthpiece and dust cap for storage of your HandiHaler device.
COPD and SCI

- Use of inhaled medications when hand control poor
- Systemic steroids
  - and their complications with poor skin healing, metabolic effects, bone density
- Smoking cessation
- Oxygen therapy
- Concurrent sleep apnea
Pulmonary Conditions: PE

- Chronic SCI is NOT necessarily a risk factor for pulmonary emboli but as a missed diagnosis has potentially devastating consequences, high index of suspicion is warranted
  - Diagnosis difficult in able-bodied
  - SCI patients have presented only with fever or altered spasticity pattern
- Prophylactic anticoagulation NOT needed after acute injury in absence of other risk factors
- Increasing use of IVC filters in acute SCI to be considered, long term effects evolving
What to tell your patients

• Stay up to date on immunizations
• Don’t smoke
• There are alternatives to awkward inhalers for those with limited hand mobility
• Get checked for sleep apnea
• Don’t panic with respiratory infections
  • Colds don’t always need Rx
• Don’t tough it out if struggling to cough
• Teach caregivers assisted coughing
Sections

- Autonomic Dysreflexia
- Pulmonary Conditions
- **Cardiovascular Conditions and Stroke**
- GI and GU conditions
- Musculoskeletal conditions and pressure sores
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Hypertension

- Major societies have published definitions of hypertension, as will be described below. Hypertension was defined as a blood pressure $\geq 140/\geq 90$ mmHg.
  - Normal blood pressure: systolic $< 120$ mmHg and diastolic $< 80$ mmHg
  - Prehypertension: systolic 120-139 mmHg or diastolic 80-89 mmHg
  - Hypertension:
    - Stage 1: systolic 140-159 mmHg or diastolic 90-99 mmHg
    - Stage 2: systolic $\geq 160$ or diastolic $\geq 100$ mmHg
Hypertension and SCI Physiology

• Low baseline blood pressure 90-100 Systolic
• Compensation for loss of sympathetic tone via increased renin, angiotensin, aldosterone
• Autonomic Dysreflexia
• Orthostatic hypotension
• Approximately 23% of veterans with HTN >140/90
  • 2007 Weaver, 2008 Hizig
Hypertension and SCI questions as a PCP I think about…

• Do ACE-I work as well in SCI patients as in non-SCI patients?
• What are goal blood pressures?
• Orthostatic hypotension
• Maintenance meds and superimposed autonomic dysreflexia
• Beta blockers in those at risk for AD?
• Short acting vs. long acting
• Side effects: edema, cough, constipation
Hypertension and SCI

- Treatment for hypertension in SCI as in able bodied seems to prevent stroke and worsening of cardiac function as in able bodied
- 24h BP monitor may be useful especially for patients with blood pressure changes in or out of bed
- Short acting and BP-triggered dosing may be best for those with labile HTN
Coronary Artery Disease (CAD)

- Coronary artery disease (CAD) is generally used to refer to the pathologic process affecting the coronary arteries (usually atherosclerosis). It is sometimes used synonymously with CHD.

- Coronary heart disease (CHD) includes the diagnoses of angina pectoris, myocardial infarction, silent myocardial ischemia, and CHD mortality that result from coronary artery disease.
CAD and SCI

- Metabolic syndrome
  - Risk increased in chronic SCI
- Reported in multiple studies to be leading cause of death in Chronic SCI (25%+)
  - Dr. DeVivo’s presentation: 12% (9 + 3)
- Silent ischemia unrecognized
  - Up to 60% one study (Lee)
- Sleep apnea
CAD and SCI

- Stress testing with arm ergometry
  - “best” but not available everywhere
  - Chemical Stress tests with adenosine
- Mimickers/altered perception of visceral pain
  - GERD, shoulder pain, dysreflexia, peptic ulcer disease, altered spasticity pattern
- Cardiac catheterization
  - Risk of contrast nephropathy
  - IVC Filter??
CAD and SCI

- Medications
  - Aspirin, statin, beta blocker, ACE-inhibitor
  - Are they all OK as usual in SCI patients?

- Stents
  - Drug eluting: ASA and Plavix (forever?)
  - And then can they use PPI therapy on Plavix?

- CABG
  - Recovery time, upper extremity concerns especially for paraplegics
Cardiovascular Conditions: Ischemia

- Patients with SCI are living longer, long enough to acquire CV disease but risk directly related to SCI is unclear
- Metabolic issues raise risk...
  - Hyperglycemia, low HDL, low exercise, insulin resistance, body composition changes
- Low blood pressure lowers risk...
- Risk of “silent” MI if they have one is substantial
  - Atypical “atypical chest pain”
  - Altered spasticity
  - Autonomic dysreflexia
  - Unusual fatigue
Cardiovascular Conditions: Orthostatic Hypotension, Dysrhythmia

• Peripheral vasodilatation
  • Worst acutely but can persist for years
  • Abdominal binders, compression stockings
  • Increased salt intake, Rx meds
  • May become severe after bedrest in patient who usually tolerates transfers reasonably well

• Relatively increased vagal tone predisposes to cardiac dysrhythmias (including cardiac arrest) in quadriplegics
John Callahan, cartoonist
CALLAHAN

“OKAY, LET’S GET THOSE EYEBALLS MOVING!!”
Stroke

- Autonomic Dysreflexia is the most common cause of stroke in chronic SCI patients
- Difficult to diagnose with pre-existing deficits
- Incidence slightly less than general population
  - Lower blood pressure (probably?)
  - SCI population is younger overall
What to tell your patients

• High blood pressure matters to them as well as able bodied

• Smoking cessation is a must

• Heart attacks can present with dysreflexia symptoms, “feeling tired” or “feeling bad”

• Let the ER figure out if “heartburn” is really “heartburn”

• The treatments for CAD for able bodied should be used in SCI/D
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Gastrointestinal Conditions

- Acute Abdomen presents a special diagnostic problem for chronic SCI
  - Difficult to localize pain or symptom below lesion
  - Dysreflexic symptoms can overlap with GI or urological, gynecological pathology
- Lesions T12 and lower have “typical” presentations, higher do not
- If SCI patients go to surgery for abdominal events, they do as well as non-SCI patients
Gastrointestinal Concerns

• Chronic SCI patient with possible abdominal pathology…
  • Probably relies on a bowel regime for regularity (medication, fiber, manual)
  • Gaseous distension often seen on plain x-ray (may be normal)
    • Must have clinical correlation
  • Increased risk of gallstones
  • Shoulder pain in quadriplegic can be referred abdominal pain
  • Change in spasticity from extensor to “protective” flexor abdominal is noteworthy
What to tell your patients

• Include medications for bowel regime in list of active medications

• Dysreflexia can be a sign of internal illness

• If they need surgery or drains etc, risk of procedure not very different from able bodied
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Urinary Tract Conditions

• Urologists know this stuff…

• Most patients with SCI see Urology annually—ingrained in rehab

• Infection and Urinary Tract Complications WERE the leading cause of death until long term urologic strategies focusing on…
  • Adequate drainage
  • Low pressure storage and voiding
  • Management of infection

• Avoidance of surgical drainage and indwelling catheters
Urologic Concerns

- Bladder-sphincter dyssynergy
  - Bladder contracts against closed sphincter
  - Increased intravesical pressures, ureteral reflux, stones, dysreflexia, hydronephrosis, renal failure

- Clean intermittent catheterization
  - For patients with upper extremity function—works great
    - 30% higher rate of infection when done by someone else

- Condom catheter—for men
Urologic Concerns

- Sphincter management: surgical sphincterotomy, Botox injections, stents (high rate erosion)
- Surgical management: various urinary diversions, continent urinary reservoir
- Sacral root electrical stimulation
- Increased risk of bladder cancer
  - Especially with indwelling catheters
  - Surveillance cystoscopy
Urologic Concerns: Infection

• Indwelling 5-7% infection per day, soon reach 100% bacterial colonization

• Symptomatic vs. asymptomatic UTI
  • Spasticity, dysreflexia, fever, especially foul urine, change in bowel habits, abdominal symptoms

• Avoid prophylaxis against UTI in general, but it has proponents

• Antibiotic “on-hand” prescription for patients who recognize difference between infection and colonization is very useful
Urologic Concerns: Stones

• Increased risk of renal and bladder stones
• Pubic hair nidus for bladder stone formation (among other causes) introduced w/catheterization
• Treatment with shock waves for renal stones usually successful
What to tell your patients

• Stay in touch with Urologist forever
• Educate doctor about catheter types
  • Consider bringing in samples of what is used at home
  • Hard for MD to write rx for something never seen
• Antibiotics on hand are OK in selected situations
• Difference between infection and colonization
“This town ain’t accessible enough for both of us.”
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Musculoskeletal Conditions

- Spasticity
  - From Helpful to Inconvenient to Dangerous
  - Medications (much use, little data)
    - Oral baclofen, tizanidine, gabapentin, diazepam, clonidine
    - Intrathecal opioids, baclofen
  - Change in spasticity heralding other problems
    - Injury, illness, syrinx
- Procedures
  - Surgery (nerve/destructive, orthopedic), injection (Botox)
Musculoskeletal Concerns

- Overuse injuries
  - Quadriplegics hook arm over handle of chair
  - Paraplegics overusing arms
  - Altered mechanics of motion
- Unrecognized limb injuries
  - Foot dragging, foot caught
- Nerve entrapment/compression
Pressure Ulcers

• The best “treatment” is prevention

• Constant education about importance of pressure relief and daily monitoring for skin damage

• Challenge for quadriplegics
  • Tilting wheelchairs, ROHO Cushions, assisted changes in position

• Edema, nutrition, transfer safety…

• Get the pressure OFF—avoid the surgeon!
Pressure Ulcers

• Why don’t PCP’s know what to do?
  • Never seen a wheelchair provider visit my office
  • Never seen a cushion provider at national or regional medical meeting
  • Never seen an advertisement in any of my internal medicine medical journals
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What to tell your patients

• PCP probably has no idea what you are sitting on and why
• Teach PCP about cushions and wheelchair
• Get him/her copy of mobility magazine for reference
• PCP and local surgeons may know very little about how to manage pressure sores without surgery
Diabetes

• Type 1: Destruction of pancreatic beta cells, insulin deficiency early on

• Type 2: Insulin resistance, more common, can lead to insulin deficiency

• US population estimates 6-15% increasing with age and BMI
  • NHANES, CDC Fact Sheets

• Non-SCI Veterans diabetes increase with age and BMI 10 to 30%

• People don’t usually die of diabetes, they die of complications like CAD, renal failure
Diabetes and SCI

- Veterans with SCI and DM: 18-20%
  - LaVela 2006, Sepahpanah 2011
  - US population 6-15% (NHANES)
- Metabolic syndrome concerns
  - Body fat vs. total body weight and BMI
  - Inflammation (CRP)
  - Lack of exercise
  - Obesity
  - Risk of CAD independent of DM
- Pressure sore not healing? Check glucose…
**Diabetes and SCI**

- Diet and weight loss
  - Losing weight does not require exercise
  - Increasing studies on the lack of benefit of exercise for weight loss in able-bodied populations
  - Carbohydrate content of diets
- Bariatric surgery
  - “curative” in able bodied
- Treatment goals?
  - 50+% of veterans with SCI with AIC < 7
Diabetes and SCI

Dietary Weight Loss Improves Insulin Sensitivity

BY BRUCE JANCIN
AT THE ANNUAL MEETING OF THE ENDOCRINE SOCIETY

HOUSTON – Diet-induced weight loss significantly improved insulin sensitivity and risk factors in an obese randomized trial showed.

The primary outcome was change in insulin sensitivity index (ISI) over 1 year as measured via a 75-g oral glucose tolerance test. At 6 months, there was nearly a 50% greater ISI in both weight-loss interventions – exercise and diet-plus-exercise groups – compared with baseline and the control group. At 1 year, there was a nearly 2-fold increase in the exercise group, while the diet group showed no change in ISI.

Younger Next Year*

Live Strong, Fit, and Sexy—Until You're 80 and Beyond

Chris Crowley & Henry S. Lodge, M.D.
**Diabetes and SCI**

- **Oral Medications**
  - Increase insulin secretion, increase sensitivity to endogenous insulin, inhibit carbohydrate absorption
- **Injectable (non-insulin)**
  - Exenatide (Byetta)
- **Insulin**
  - Where to inject when sitting in chair?
  - Hypoglycemia management? For quadriplegic?
- **Veterans with SCI**
  - 60% oral meds, 25% insulin, 12% both
Metabolic and Endocrine Conditions

• Obesity
  • Food is pleasurable when many other sensations are not

• Glucose intolerance
  • Baclofen, altered body composition

• Caloric predictor models usually overestimate needs (5-32%)
  • Resting metabolic rate estimated to be 14-27% slower than able-bodied
  • Spasticity burns calories too…
Metabolic and Endocrine Conditions

• Osteoporosis
  • Affecting bones below level of injury
  • Spine density relatively preserved
    • sitting as weight-bearing “exercise”? 
  • Bone loss distal limbs often not of great impact because not weight bearing; do fracture easily with “minor” trauma
• Some consider IV bisphosphonate acutely
  • Oral agents do attenuate bone loss
  • Increasing concerns about pathologic fracture
Metabolic and Endocrine Concerns

- Small study of women with thoracic SCI had galactorrhea with or without amenorrhea, seemed especially susceptible to drug effect
  - Not thought due to chest wall stimulation
- Male and female sexual hormones generally function as they did pre-injury
Sections

- Autonomic Dysreflexia
- Pulmonary Conditions
- Cardiovascular Conditions and Stroke
- GI and GU conditions
- Musculoskeletal conditions and pressure sores
- Endocrine/Diabetes
- Sexuality, fertility, and pregnancy
- Age and SCI
- Adjustment
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• Adjustment
Adjustment to Chronic SCI

- “Nothing truly important in life is ever completely over and dealt with, once and for all, final and forever.”
- “This &#%@ just finds new and inventive ways to torture me”
- “What an inspiration…”
- “What a shame…”
Adjustment to Chronic SCI
"It's a '57 Chevy with chrome wheels, tinted windows, Hurst 4-shift, and a 283 with dual quads."
Adjustment to Chronic SCI

• A reminder that suicide remains a disproportionately large cause of death in persons with SCI
• Even the most “well adjusted” suffer
• Those lacking social support struggle the most
• Financial problems
  • Working loses benefits to pay for care attendants, costs of care exceed income generation
Adjustment to Chronic SCI

- Most devastating effects on the oldest and least time since injury
- Ventilator dependency did not decrease quality of life
  - Loss of upper extremity function was felt to be greater “loss”
- Marriage, vocation, self-assessed perception of health, positive spirituality improve adjustment
101
Reasons to Marry a Quadriplegic

RHONDA CROZIER EVATT
Jorn Family Story
Bernie’s Story
Jorn Family with Rumble Seat
Adjustment to Chronic SCI

- More active and socially engaged before injury tended to be so afterwards
- Depression is common, may not be “appropriate acceptance”, should be treated
- Seasonal Affective Disorder may be even more common
- Encourage “out-of-the-box” thinking to problem-solve in every-day life
- Is electronic Social Networking as “good” for SCI engagement as “real life?”
Adjustment to Chronic SCI

- Rollercoaster of new/promising treatments
  - NPR May 31, 2008 monkeys using brain-implanted electrodes to feed themselves w/mechanical arm
  - Stem cells even from dental pulp (2011)
- Accept the function he/she has while maintaining some hope for future?
Adjustment to Chronic SCI

- Television newscaster in Columbia, SC
- Paraplegic in junior year of college
- Rumored to have passed up offers for NBC national anchor position
- “…they don’t know that I’m already healed…”

Susan Aude’
Adjustment to Chronic SCI

- Community resources
  - Vocational rehabilitation
  - Local or regional rehabilitation centers
- Internet support sites flourish
- SCI patients referred to as a “community” but not monolithic
  - “No, I don’t know Bob the guy in the wheelchair”
- [http://www.newmobility.com/index.cfm](http://www.newmobility.com/index.cfm) and other publications for active patients
So if you want a PCP, how to find one?
Primary Care Access

• Health Care Reform
• Reimbursement for primary care already poor
• Concierge or Retainer Medicine
  • Increasingly popular nationwide
  • Ability to pay out of pocket for most
  • Pilot program (Harvard/Boston) for high utilizers of care regardless of ability to pay
• No easy answers
Finding a Primary Care Doctor

- Do they know about SCI?
  - Will/Would they learn?
  - Will they work with Neurology, PMR, rehab center long term?
- Accessible office (really!)
- Do they like complicated cases?
- Do you have rapport with him or her?
- Good reputation from other SCI patients?
Resources

• Brooks Rehabilitation Hospital  
  http://www.brooksrehab.org/

• UpToDate Chronic Complications of Spinal Cord Injury
  • http://www.uptodate.com/

• Paralyzed Veterans of America  http://www.pva.org

• Shepard Center  
  http://www.shepherd.org/resources/spinal.asp

• The Miami Project to Cure Paralysis  
  http://themiamiproject.org/x21.xml

• Christopher and Dana Reeve Foundation  
  http://www.christopherreeve.org
Selected References

• Up-to-date www.uptodate.com
  • Articles on Chronic SCI, Diabetes, HTN, CAD, COPD


• Selected ASCIP Slide Presentations, USB Drive Provided by ASCIP at meeting, Sept 2011


Selected References


Selected References

Primary Care Providers and Chronic Spinal Cord Injury: What Patients’ PCP’s and Hospital Providers Need to Know and how you can help them

Paralyzed Veterans of America
August 2012
H Keels S. Jorn, MD
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