

# Physician

The Independent Medical Business Newspaper

Living with the consequences of a spinal cord injury (SCI) in the community is a challenge for patients, families, and health care professionals. Slightly more than half of traumatic spinal cord injuries result in quadriplegia; the remainder result in paraplegia. Many more people experience non-traumatic injuries caused by spinal stenosis, disc herniation, epidural abscesses, spinal cord infarcts, meningitis, multiple sclerosis primarily affecting the spinal cord, and benign or malignant tumors.

Patients are encouraged to see a primary care physician soon after rehabilitation, so the physician can become familiar with their condition and anticipate nonemergent problems. During rehabilitation, patients receive extensive education about potential body-system problems and recommended treatments. Community physicians and their staff are encouraged to listen carefully to these patients and their caregivers because they have knowledge and insight into the likely problems and possible interventions. Physiatrists—physicians boarded in physical medicine and rehabilitation—often work with primary care physicians in managing the health of patients with SCI.

With increasing life expectancy due to improved urinary tract care, we are seeing the consequences of aging with SCI, including hyperlipidemia, diabetes (higher incidence than for non-SCI patients), heart

## Life after spinal cord injury

### *Common problems encountered by physicians*

By Jennine Speier, M.D.

disease, and obesity. Musculoskeletal wear and tear may lead to increasing disability. People who have suffered an SCI require lifelong follow-up that focuses on their specific needs.

Accredited spinal cord injury rehabilitation programs, such as that offered at Sister Kenny Rehabilitation Institute, recommend annual or biannual outpatient follow-up with a physiatrist and urologist to review their systems and health care needs proactively. This process requires coordination with physical, occupational, and hand therapists; social service workers; wound and seating evaluators; rehabilitation nurses; and counseling, chemical dependency, and vocational counselors.

Persons with SCI can present to physicians with problems affecting multiple systems, making diagnosis and treatment difficult. Some common presentations are discussed below.

#### **Limb swelling**

Immediately after injury, patients are vulnerable to blood

clots, sometimes requiring implantation of an inferior vena cava umbrella filter, which can contribute to subsequent lower extremity edema. After the first three months, the incidence of clots drops dramatically unless the patient has a fracture or contusion. Lower extremity edema can be reduced by range of motion exercises, elastic stockings, weight shifts, reduced dietary salt, and adequate protein intake.

After injury, deposition of young bone cells in soft tissues around hips, knees, shoulders, and elbows (a process called heterotopic ossification) can occur. It mimics a deep venous thrombosis or cellulitis, with swelling, fever, erythema, stiffness, and reduced range of motion. Usually a CT scan, bone scan, and alkaline phosphatase can help with this diagnosis. Treatment includes etidronate, vigorous passive range-of-motion exercises, and NSAIDs (non-steroidal anti-inflammatory drugs). Sometimes radiation and surgery (once the soft-tissue calcification has matured) are needed.

Osteoporotic fractures with minimal stress (torque with range of motion) are serious complications. Knees and femurs are the most vulnerable. With any swelling of a limb, fracture must be suspected and ruled out. Patients usually do well with surgical treatment; if casting is used, the casts must be well padded and removable in order to monitor skin.

Administering IV pamidronate periodically and then switching to oral biphosphonates shortly after injury can help prevent osteoporosis. Patients should be discouraged from smoking and encouraged to take adequate vitamin D and calcium.

#### **Orthostatic dizziness**

SCI interferes with postural blood pressure adjustments, causing orthostasis. This can be treated with midodrine, Florinef, compression stockings, and abdominal binders. Patients can use wheelchairs that tilt in space or have power leg elevation to manage their blood pressure problems. Obviously, sepsis and fluid depletion must be ruled out.

#### **Increased spasticity and autonomic dysreflexia**

Increased spasticity is another presenting concern with many causes. Spasticity may not be accompanied by the hypertension and other autonomic symptoms that are classic to autonomic dysreflexia. However, spasticity, like autonomic dysfunction, can be a response to noxious stimuli or illness.

Spasticity results from the removal of central inhibition on the reflex arc. Medications based on inhibitory transmitters such as GABA (gamma amino butyric acid) can be effective orally but they may be ineffective or poorly tolerated. Therapies targeted to the spinal cord, such as the intrathecal baclofen pump, as well as biofeedback and muscle-targeted therapies with Botox, have resulted in reduced spasticity. Decreased spasticity allows strengthening and improved control of residually functioning muscles. The intrathecal pump offers the advantage of 24-hour microgram dosing to the cerebrospinal fluid, thus decreasing central side effects of sedation. Antidepressants such as Effexor, Prozac, and Paxil can increase spasticity and rigidity in persons with SCI.

If there is no external cause of spasticity in a patient with an implanted baclofen pump, the possibility of malfunction or need to refill the pump should be considered, and consultation with the office of the physician managing the pump is in order. If withdrawal is suspected after ruling out other causes, the patient can be treated with oral baclofen.

Potentially life-threatening hypertension (autonomic dysreflexia) can occur in persons injured above thoracic vertebra T7. A noxious stimulus below the level of injury stimulates the sympathetic nervous system. Irritating stimuli may include a bladder infection or overdistension from a blocked urinary catheter; impaction of the bowels or constipation, dilated colon or ileus, impending or actual skin breakdown, withdrawal from medications (including nonfunctioning baclofen pump), trauma, or even an infected ingrown toenail. Other factors that increase vulnerability to autonomic dysreflexia include a spinal cord cyst or syrinx, spinal cord scarring, spinal cord tethering, and disc herniation.

Hypertension can cause strokes, cerebral bleeds, encephalopathy, and seizures and may occur at a pressure

that most physicians feel should be easily tolerated. Seizures from dysreflexia with systolic blood pressures at 130–140 have occurred in persons whose baseline normal systolic pressures run in the high 80s.

During initial rehabilitation, patients and their families are taught how to treat autonomic dysreflexia. The first step is to elevate the head to promote orthostasis. This provides time to locate the irritating stimuli. Once the noxious stimuli are relieved (e.g., by draining the bladder, changing position, or completing bowel evacuation), blood pressure may drop rapidly. Where the source is not obvious, medications may be needed to control blood pressure.

### **Urinary tract infections (UTIs)**

Neurogenic bladders may cause incontinence (with associated skin irritation) or retention, ureteral reflux with hydro-nephrosis, and, ultimately, renal failure. Maintaining a low-pressure, low-volume bladder and providing routine urological follow-up have been shown to significantly reduce morbidity and mortality from renal problems.

Physicians are urged to treat UTIs when symptomatic, not by urinalysis and culture alone. Urine culture and urinalysis should be obtained prior to starting antibiotics. The number of white blood cells and bacteria, as well as the type of bacteria growing, can guide treatment decisions. Performing appropriate sensitivities can decrease the likelihood of resistant organisms.

### **Shortness of breath and respiratory infections**

Patients with high paraplegia and quadriplegia are vulnerable to pneumonia; they have ineffective coughs and need the assistance of trained individuals to increase intra-abdominal pressures (“quad cough”). They may benefit from early administration of antibiotics, as well as home nebulizer treatments.

Adequate protein nutrition is critical for improving diaphragm strength. If a

patient’s complaints suggest sleep apnea or respiratory fatigue, the physician should check oximetry, blood gases, and sleep studies, and do trials of a CPAP or BIPAP device.

### **Pain**

Shoulder pain is a common problem for persons who have had SCI. Rotator cuff and biceps tendon injuries related to weight gain or repeated transfers can erode remaining independent function, and therefore must be either ruled out or treated with therapy and modification of activities. Minimizing transfers to and from un-level surfaces (e.g., transferring in and out of cars) is critical. Sliding boards and lifts can prevent re-injury and are cost effective.

Neuropathic pain, often only partially responsive to narcotics, is likely related to impaired pain pathways. External causes such as UTIs can make the burning neuropathic pain worse. MR or CT scans can help rule out spinal cord tethering or a syrinx as a cause. Anti-seizure medications, especially gabapentin and pregabalin, have been effective, while the older tricyclic antidepressants, such as amitriptyline, still play an important role in pain control. Integrative medicine interventions such as acupuncture, alpha stimulation, massage, guided imagery, and healing touch also have been beneficial.

### **Constipation**

Bowels are trained to empty on a daily or every other day schedule and should empty at least every three days. Stool softeners, laxatives, and suppositories can help determine the timing of the bowel program and assure complete emptying. Eventually, medications may not be needed and digital stretching of the sphincter alone can effect the evacuation. In chronic patients with particularly long bowel programs, colostomies may be indicated.

### **Skin breakdown**

Decubitus ulcers are both financially and psychologically cost-

ly, as the patient must be on bed rest while healing. Patients and families are taught early preventive interventions, such as pressure mapping to optimize wheelchairs and cushions, frequent pressure relief, and frequent monitoring of pressure areas. Wound treatments include high-protein supplements; total pressure-removal bed rest or splinting; changes in cushions or mattress; vacuum dressing; and, sometimes, plastic surgery.

### **Preventive medicine**

Proper caloric intake and protein intake are important preventive measures. Persons with SCI often have to rely on others for meal preparation and as a result, resort to fast foods or pre-prepared food. When meal help is unavailable, they may not eat three meals a day. These difficulties can lead to weight gain, inadequate bowel programs, and poor management of cholesterol.

Because people with SCI lack aerobic exercise, their HDLs tend to run low. Therefore, attention to family history of atherosclerotic disease is important, even with young patients.

### **Waiting for breakthroughs**

It behooves us to provide optimal care and rehabilitation to patients with SCI to help them achieve maximum function. Avoiding complications of loss of motion, osteoporosis, and system failure can make it possible for them to benefit from future curative treatments. To enhance their journey toward wellness and take advantage of scientific treatment breakthroughs, teamwork by primary care health professionals and rehabilitation workers is critical. ■

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