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Autonomic Dysreflexia

What is Autonomic Dysreflexia?

Autonomic Dysreflexia (AD), also called Autonomic Hyperreflexia, is a potentially life-threatening condition that affects individuals with a spinal cord injury (SCI) at the T6 level or above. It results due to pain or discomfort beneath the level of injury. This condition may occur even if you cannot feel the pain or discomfort beneath the level of injury. Damage to the spinal cord causes a change in part of the nervous system called the autonomic reflexes. These reflexes normally control things like blood pressure, heart rate, breathing, and sweating. After a spinal cord injury, if these are triggered and the individual is unable to distinguish or stop the irritating stimuli, he/she may experience a dangerous rise in blood pressure, which can put him/her at increased risk for stroke, organ damage, seizures, or death.

Common Causes

Autonomic Dysreflexia is generally caused by something that would have caused pain and discomfort in your body prior to your injury. These causes may include:

- Full bladder (sometimes caused by a kinked or blocked catheter)
- Constipation or bowel obstruction
- Pressure sores
- Sunburn
- Extreme hot or cold temperatures
- Menstruation or menstrual cramping
- An ingrown toenail or cut in skin
- Tight clothing
- Stomach ulcers
- Broken bone
- Sexual activity

Symptoms

All of the symptoms for AD are caused by rising blood pressure. This high blood pressure is the reason this condition is an emergency. Your blood pressure will continue to rise until the irritation is removed. Although symptoms vary person-to-person, common symptoms include:

- Headache
- Goosebumps, flushed skin, and/or sweating above the level of injury
- Blurred vision
- Seeing spots in the front of your eyes
- Nasal stuffiness
- Slow pulse
- Cold and clammy skin below level of injury
- Chills without fever

Treatment

If you notice these or other symptoms, you should immediately sit up if lying down and try to find and remove the cause by:

- Check for bladder problems first (check indwelling catheter for kinks or perform a catheterization if you have an in/out catheter)
- Check the bowel if the bladder is not the problem
- If neither the bowel nor bladder is the problem, check for other causes listed above.
- If you cannot find the cause, call 911 and go to the nearest hospital immediately.

Preventing Autonomic Dysreflexia

You may prevent AD by doing the following:

- Maintaining a consistent bowel and bladder program. This will be addressed later in this manual.
- Checking for pressure ulcers and using pressure relief techniques
- Avoiding other skin injuries like sunburn, cuts, or bruises
- Using good techniques and well-functioning equipment to avoid falls and injuries
- Wearing loose clothing
Prevention of Pressure Sores

What is a pressure sore?

Those with a spinal cord injury (SCI) are at a high risk for developing a pressure sore (also called a decubitus ulcer, bedsore, pressure ulcer, and skin breakdown). A pressure sore is a place on the skin where the underlying muscle and tissue are damaged from loss of blood flow to the area. Without the blood to keep the tissue alive and healthy, the skin begins to die. Normally, your nerves send messages to your brain when you’ve been sitting in one position too long and tell you to move. After a spinal cord injury, you may not feel these signals telling you to shift your weight. Although 80% of those with a SCI will develop a pressure sore, most are preventable.

Common Causes

Certain medical or situational conditions may increase your chances of getting a pressure sore. Lost muscle mass, being over- or underweight, poor circulation (can be caused by smoking or diabetes), illness, and spasticity increase the risk of an ulcer. Wet skin is more prone to breakdown as it becomes more fragile and prone to infections and may stick to surfaces during transfer. These risk factors alone combine with situational factors to cause an ulcer. Pressure sores can result from a variety of situations, including:

- Too much pressure in one spot for too long without moving
  - Sitting too long without shifting weight
  - Lying too long without rolling over
  - Inadequate padding in bed
  - Tight clothing
  - Sitting or lying on hard objects (buttons, catheter clamps, or bulky seams in clothing)

- Shearing movements where the skin moves one way and the bone underneath moves another way
  - Transfers
  - Muscle spasms
  - Sliding
  - Slouching in a chair

- Skin trauma of any kind
  - Cuts or scratches
  - Bumps or falls

Treatment and Prevention

To prevent pressure sores, you should make a regular routine of the following:

- Check your skin twice a day (at morning and at night) for changes in color, bruises, bumps, hardening, dry spots, and swelling. A discolored spot is the first sign of an ulcer.
- Use foam pillows to pad your bed and schedule regular turnings every 2-6 hours depending on your skin tolerance or 20-30 minutes if you have a complete spinal cord injury
- Bathe daily with mild soap and be sure to thoroughly dry the area
- Sit as erect as possible and use safe transfer techniques
- Avoid excessive sun exposure and extreme temperatures (hot and cold)
• If a pressure sore has begun, shift weight off of the area and contact a medical professional for treatment.
• If you are in a wheelchair, pressure relief becomes very important to do on a regular basis while in your chair. Pressure relief should be done for two minutes every 30 minutes.
• Depending on your abilities and chair type, your therapist can show you pressure relief strategies that work with your situation best.
Bladder and Bowel Management

Introduction

Before a spinal cord injury, controlling bladder and bowel function is partly under conscious and partly under unconscious nervous control. After a SCI, the interaction between the voluntary and involuntary control over bladder and bowel movements may be disrupted and you may either pass urine and stool when you do not desire to or have difficulty passing urine and stool. This may cause discomfort or pain in your abdomen, trigger Autonomic Dysreflexia, contribute to depression or anxiety, and negatively impact your quality of life. Because of this, it is important to maintain a consistent bowel and bladder program to keep your body on a consistent pattern of waste elimination.

Bladder Management and a SCI

The tubes, organs, muscles, and nerves that work together to make, store, and carry urine are collectively called the urinary system. This system includes two kidneys, two urethras (tubes that connect the kidneys to the bladder), the bladder, and the ureter (the tube that carries urine out of the body). The purpose of the urinary system is to filter blood and excrete the waste product in the blood as urine. At the lowest point of your spinal cord, there are a group of nerves called the sacral micturition center that connect the spinal cord to your bladder. These nerves also send signals to the brain about when your bladder needs to be emptied.

After a spinal cord injury, this connection is interrupted and the messages may not correctly reach the brain. This interruption means that you may not be able to properly control the sphincter (a band of muscle at the end of the bladder) that keeps urine from leaving your body, meaning you may not be able to stop or start urination. Extent of damage and control over your bladder may vary person-to-person. In order to keep your body working properly and prevent a UTI, it is important that you keep yourself on a regular bladder routine.

Options for Bladder Management

To maintain a healthy bladder, there are four common procedures described below, most of which include catheterization. The best program for you should be decided based on your level of injury, your lifestyle, the type of bladder you have, and your susceptibility to infection.

1. Intermittent catheterization program (ICP) – This is performed with a small rubber or plastic tube that is inserted into the bladder through the urethra to drain the urine. It is recommended that this be done about every 4 hours and 4-6 times per day, but you may have to do it more often depending on how much you drink. You should aim to keep your catheterization volume beneath 500 ml to ensure that your bladder is not overstretcing.

2. Indwelling catheters – these are catheters that are inserted into the bladder and are only changed on a periodic basis. A Foley catheter is inserted into the bladder through the urethra and held in place. A suprapubic catheter is...
surgically placed into the bladder through the abdominal wall above the pubic bone. Indwelling catheters are connected to urine collection devices as they are always draining urine. A variety of urine collection devices is available to suit your lifestyle.

3. Stimulated voiding – some bladders can be stimulated through manual pressure applied to the abdomen. One technique is to use “tapping” on the abdomen just above the bladder and can activate a spastic bladder to contract and release urine. Another technique is called “crede” and is used with a flaccid bladder. In this technique, you should apply firm pressure to the abdomen above the bladder during straining or bending forward. Neither of these techniques use a catheter.

4. Spontaneous voiding management – some bladders will reflex to void urine on their own. If this is your situation, you should use an external collection device or manage by timing the bladder. For this type of program, males may wear a condom catheter. If you do not wear a condom catheter or are a female, then you will need to carefully balance and monitor your fluid intake and use protective undergarments.

Bowel Management and a SCI

The digestive system is made up of the organs that help break up food and extract nutrients from it. This includes your mouth, esophagus, stomach, small intestine, and large intestine along with other accessory organs that aid in digestion. Through this process, the food is broken down and the “good stuff” extracted in the stomach and intestines. In the large bowel, water is removed and the waste that is left over is called stool or feces. When the large intestine fills, a nerve signal travels to your brain telling you it is time for a bowel movement.

After a spinal cord injury, the process of eating and digestion does not change, but the message that is triggered when the bowel is full cannot travel to the brain to tell you it is time to have a bowel movement. In addition, you may not be able to move the muscle at the opening of the rectum to control the bowel movement. Those with an injury at or above the T12 level will generally have a “reflexive bowel” which keeps the closing of the rectum tight until it reflexively empties by getting full. Although the bowel empties, the signal still does not reach the brain. If your injury is below the T12 level, then you will likely have what is called a “flaccid bowel” where the anal muscles stay relaxed and the bowel must be emptied manually.

Options for Bowel Management

After a SCI, training the bowel to have regular movements is important. A bowel program is the term used for techniques that are used to assist in eliminating stool when the bowel does not work as usual. In order for the training to work, the bowel program needs to occur at the same time every day or every other day.

Bowel programs work best 20-40 minutes after eating as your body naturally stimulates the movement of feces through the large bowel after eating. It is best to be in a sitting position to allow gravity to assist you. If you are unable to sit, you may complete your bowel program by lying on your left side. Adaptive equipment may aid you and may include a padded rolling shower chair, a bedside commode, grab bars in the bathroom, a raised toilet seat, or others. Specific programs are modified to you and your injury but included below are a few types of bowel programs. Your medical professional will help to choose the option that is best for you and provide further details about the procedures. These methods may be used in combination with each other.

• Suppository – this is a solid type of medication that is inserted into the rectum to stimulate a bowel movement. Suppositories act in 10-30 minutes. This is typically used with a reflexive bowel.
• Digital stimulation – this is a way to stimulate the colon using your fingers or assistive device to move stool into the rectum and is typically used with a reflexive bowel. While a suppository will empty fecal matter already present at the end of the colon, digital stimulation will trigger your bowel to move feces from higher up in the colon. Doing this will prevent accidents throughout the day.

• Manual evacuation – this is the emptying of the rectum using the fingers to gently hook the stool. People who use this strategy usually have a flaccid bowel.
Spasms and Spastic Hypertonia

What is Spastic Hypertonia?
Spastic Hypertonia is a term that doctors use to refer to uncontrollable jerking or stiffening of muscles after a spinal cord injury. It is sometimes called spasticity or rigidity. About 65-75% of spinal cord patients have some spasticity after injury, and it is more common in those who have a neck (cervical) injury than those who have an upper (thoracic) or lower (lumbar) back injury. Severity may vary person-to-person, but symptoms may include sudden, involuntary muscle jerks; overactive reflexes that cause stiff muscles at rest or a muscle spasm when you are lightly touched; or muscle tightness during activity that makes it difficult to control your motions.

Causes of Spastic Hypertonia
Immediately after a SCI, the body is in what is called a “spinal shock” state. During this time, normal reflexes are not present. After a few weeks, this resolves and normal reflexes may return and become exaggerated, as the brain no longer controls them. Under normal circumstances, our reflexes serve to protect us from dangerous things. For example, if you touch a hot stove, you will instantly pull your hand away, and your brain gets the message that the stove was too hot to touch. A SCI disrupts this message, and reflexes may become exaggerated.

As a result of the exaggerated reflexes, some muscles may get a wrong message to move. This is called a spasm and is not a sign of recovery. You cannot willingly control the spasms. Most commonly, people have spasms that bend their elbow (flexor) or straighten their leg out (extensor). Just about any type of movement may trigger the spasms:

- Quickly stretching your muscles
- Moving your arm or leg
- Irritation to the skin
- Pressure sores
- Urinary tract infection or full bladder
- Constipation or large hemorrhoids
- Fracture or muscle tears
- Tight clothing or wraps

Advantages and Disadvantages of Spastic Hypertonia

**Advantages:**
1. Maintain muscle tone and mass
2. Reduce bone loss and lower risk for osteoporosis
3. Promote circulation and improve breathing
4. Aid in daily self care routines and transferring
5. Warn about problems in the body where there is no feeling

**Disadvantages:**
1. Limit the range of motion
2. Cause pain due to stress put on joints and muscles
3. Interfere with daily tasks like driving and walking with braces
4. Cause unwanted bowel or bladder release
5. Cause scraping on the skin and increase risk for pressure sores
6. Affects posture and ability to sit comfortably or balance

Management
Doing range of motion exercises and regular stretching techniques that your therapist may show you every day can promote muscle relaxation. If you can, standing using a standing frame can help counteract the flexor tendency. Medications may also help prevent spasms. Injections into the muscles (like Botox) may also temporarily relieve spasms. Non-reversible surgery may be recommended if a spasm or contracture is too severe to manage.
Pain Management

Pain after a Spinal Cord Injury

After a spinal cord injury, pain may be a daily frustration. Acute pain is common after a SCI either because of the injury to the spinal cord or damage to other areas of the body during the injury. Chronic pain after a SCI may last months to years. It may occur in areas of no sensation as well as areas that you can feel. Although pain may cause or worsen psychological issues like depression, this does not mean that the pain is all in your head.

Types of Pain

Because of the nature of a spinal cord injury, you may experience more than one type of pain. The most common feelings of pain can be grouped into three broad categories:

- **Neuropathic pain**: this type of pain is caused by damage or dysfunction in the nervous system, and is, therefore, common in those with a spinal cord injury. It is also referred to as neurogenic pain. People most commonly describe this as a sharp, shooting, stabbing, tingling, or burning pain. It varies greatly between individuals, so you may describe your pain in different words.

- **Musculoskeletal pain**: this type of pain occurs in parts of the body like bones, joints and muscles. It is usually worsened by movement and eased with rest. Because of this, it may be increased due to transfers, arthritic changes, strain, or spasticity. This type of pain is typically described as dull or aching.

- **Visceral pain**: this type of pain is felt in the stomach or abdomen. It may be caused by a secondary complication of your SCI such as constipation, a full bladder, kidney stone, or gall stone. People generally describe this as a dull pain or cramping. Because you may not exhibit typical symptoms of one of these problems, it is important to talk to your doctor.

Pain management

To keep pain at a manageable level, medications may be required. However, you can change activities and thoughts to alter your pain. For example, you can pace out activities and make note of how long it takes for you to begin experiencing pain. Equipment may have to be modified by a professional to minimize musculoskeletal pain. Do not get in a rush to complete the activity and build up your endurance slowly. However, remaining active is important to prevent further pain.

In addition, your thoughts can magnify or diminish pain. Techniques taught through professional counseling like biofeedback and relaxation training might help to minimize pain. Keeping yourself busy and involved in activities you enjoy may help to distract you from the pain.

Be aware that pain due to a problem beneath the level of injury may be displaced to another area of the body. For example, you may feel pain in your shoulder due to gallbladder disease. This is called referred pain and should be examined by your doctor.
Disability Rights and Laws Resources

The Americans with Disabilities Act (ADA) of 1990 ensures equal opportunity and non-discrimination for those who have a disability. It includes rights for equal opportunity in employment, State and local government, public accommodations, commercial facilities, and transportation. Below are resource links for further information and specifics on disability laws:

- View more information about disability policies – www.disability.gov
- More information about the ADA is available at The United States Department of Justice Civil Rights Division website – www.ada.gov
- To view the full text of the ADA visit – http://www.ada.gov/pubs/adastatute08.pdf
- For information about employment policies visit the US Department of Labor – https://www.dol.gov/odep/pubs/fact/laws.htm

Home Accessibility Resources

Adaptations may be needed to ensure that you can safely get in and out of your own home. During rehabilitation, your physical or occupational therapist may make recommendations and your social worker can help you to find resources to cover the cost of home modifications. These modifications may include wheelchair ramps, grab bars in the bathroom, removable bars around the toilet, and adjustable counters or tables. Information about types of modifications can be found at the following resources:

- The University of Alabama at Birmingham information about home modification – https://www.uab.edu/medicine/sci/daily-living/home-modification
- Information about universal design products can be found at – http://www.universaldesign.com/
References and Resources

Resources for Further Information

- **Spinal Cord Injury Support Groups** – there are two SCI support groups in the greater Greenville area. Each support group may have its own focus like teaching newly injury patients coping strategies or recreational activities for those with a SCI. The support groups may have to cancel a meeting without notice, so it is always a good idea to call ahead. If you are not from the Greenville area, check out [http://www.brainandspinalcord.org/](http://www.brainandspinalcord.org/) for a list of support groups near you.

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<tr>
<th>Location</th>
<th>Meetings and Times</th>
<th>Contact Information</th>
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<tbody>
<tr>
<td>McAlister Square</td>
<td>First Saturday of every even month (February, April, June, etc.) at 1:00 pm</td>
<td>Byron Armentrout (864) 369–2791 <a href="mailto:wheelin19@aol.com">wheelin19@aol.com</a></td>
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<tr>
<td>225 S. Pleasantburg Dr.</td>
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<tr>
<td>Greenville, SC</td>
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<tr>
<td>St. Matthew Episcopal Church</td>
<td>Fourth Tuesday of every month at 6:30 pm</td>
<td>Dot Colson (864) 595–1947 <a href="mailto:dcolson@dennys.com">dcolson@dennys.com</a></td>
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<tr>
<td>101 St. Matthews Ln.</td>
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- **Christopher and Dana Reeve Foundation** – Since 1982, the Christopher and Dana Reeve Foundation has been working to further spinal cord injury research. This foundation has created the Paralysis Resource Center to connect patients and families with life-changing resources. Find out more at [https://www.christopherreeve.org/](https://www.christopherreeve.org/)

- **United Spinal Association** – Begun in 1946 by a group of determined paralyzed WWII veterans, the United Spinal Association continues to aid and advocate for those living with a spinal cord injury. Visit their website for more information at [http://www.spinalcord.org/](http://www.spinalcord.org/)

- **Model Systems Knowledge Translation Center** – MSKTC summarizes research, highlights health information needs and develops information resources for those with a SCI, TBI, or burn. Find out more information by visiting [http://www.msktc.org/](http://www.msktc.org/)

References


