Spinal Cord Injury and Autonomic Dysreflexia

Autonomic Dysreflexia (AD) is also known as hyperreflexia and is a condition that only affects people with spinal cord injuries. AD occurs because the pathways for your nerve signals are damaged from your injury. Individuals with injuries at T6 and above are at the highest risk for AD, but it rarely happens in people with lower levels of thoracic injury.

AD is a response to some irritant below the level of the injury. The body tries to send out signals but the signals are blocked due to the injury. Because there is no communication between the body and the brain, the blood vessels begin to narrow and this causes blood pressure to go up. When the brain senses that blood pressure is getting too high, the brain tries to lower the blood pressure by sending out signals to:

**Signal 1**: Slow the heart rate.
**Signal 2**: Enlarge the blood vessels above the level of the injury to hold more blood.
  The upper body looks flushed or red or blotchy.
**Signal 3**: Stop squeezing the blood vessels in the legs and abdomen.

With a spinal cord injury, signal 3 is blocked due to the injury so the blood vessels keep squeezing. This causes the blood pressure to stay high and it may even keep getting higher. When blood pressure gets too high, a person can have a stroke, seizure or may die.

**Know Your Blood Pressure**

The two numbers which make up your blood pressure are the top number (systolic) and the bottom number (diastolic). Most people have a blood pressure that is about the same every day. Those who are at the highest risk for AD have a systolic baseline between 90 and 110. If your baseline systolic pressure increases 20-40, this is a sign of AD. If your systolic pressure is greater than 150, seek emergency treatment immediately because it could result in a stroke, seizure or death.

**Signs and Symptoms of AD**

A person who is experiencing AD may have one or more of the following symptoms. The symptoms may be mild or even absent despite a high blood pressure.

- Pounding Headache
- Blurred Vision
- Flushed face
- Nasal Congestion
- Red Blotches on Upper Body
- Nausea
- Cool, Clammy Skin
- Chills without fever
- Apprehension or Anxiety
- Sweating Above the Level of Injury
- Goose Bumps Above the Level of Injury
- Slow Pulse

Causes of AD
Bladder issues are the most common cause of AD. The bladder may overfill due to a blockage in the urinary drainage device or stones in the bladder. A urinary tract infection (UTI) may also cause AD.

Bowel issues are the second most common cause of AD. An overfull bowel, constipation, or bowel blockage (impaction) can cause AD. Rectal digital stimulation can trigger a reaction which can lead to AD. Abdominal tests such as a barium enema or sigmoidoscopy can also cause AD.

Skin irritations, wounds, pressure ulcers and burns (sunburn) can cause AD. Other causes include insect bites, ingrown toenails, hard or sharp items that injure the skin as well as tight, restrictive or wrinkled clothes, sexual activity and overstimulation. Abdominal conditions like gastric ulcers and appendicitis, broken bones or extreme temperature changes can trigger AD. For women, menstrual cramps, pregnancy, labor and delivery can all cause AD.
Autonomic Dysreflexia (AD)

AD Treatment
If you experience AD, find and eliminate the cause! First and most importantly, get into a seated position. If you can't sit, keep your head raised as high as possible. Secondly, check for the causes of AD and correct any problem issue. Your blood pressure will drop rapidly and your symptoms will go away when the cause is corrected.

Bladder issues are the most common causes of AD so check for these potential problems first:
- Is your drainage bag full?
- Is there a kink in the tubing?
- Is the drainage bag raised higher than your bladder?
- Is the catheter clogged or plugged?
- Is it time for self-catheterization?

After you correct any obvious problems, you should change your catheter if it is not draining within 2-3 minutes. If you self-catheterize, empty your bladder.

Check for bowel issues next. Perform a digital stimulation and empty your bowel. Stop the procedure if signs or symptoms appear while doing the digital stimulation start again after the symptoms go away.

Finally, check for other possible areas of concern. Loosen any tight clothing or shoes as well as any abdominal bands or straps. Check your wheelchair, bed and seat cushions for sharp object that may be pressed into the skin causing an irritation. Look in pants pockets for keys or other objects that may be pressing into your skin.

Men also need to see if there is any pressure on the testicles and/or penis, especially during sexual activity. Condom catheters need to be checked to be sure they are not too tight.
Women may need to treat cramps (due to contractions of the uterus) before and during menstruation. Labor and delivery often trigger AD so be prepared in case of an AD episode.

**AD and Medications**

Medications are used to treat AD only if the cause can't be found and removed or when the episode continues even after removal of a suspected cause. High blood pressure medications can cause an immediate response such as Nitroglycerine Paste and Nifedipine (Procardia). Preventive medications are used if AD keeps happening. For example, a person who has a kidney stone may have high blood pressure until the stone is removed or passed or labor and delivery may require your health care provider to use medications to prevent AD from happening.

Men who take medication for erectile dysfunction (ED) may have side effects including face flushing, headaches, nasal congestion and/or changes in vision that appear as the signs and symptoms of AD. Checking your blood pressure is the best way to tell if you are having an episode of AD or side effects of the ED medication. Blood pressure that is higher than normal is an indication that you are having an episode of AD and you should immediately stop all sexual activity.

**Prevention**

If you are using a Foley/Suprapubic/Condom catheter, be sure to keep the tubing free of kinks and empty the bag frequently. Check the inside of the tubing frequently to see if there is any grit or deposit, which may be a sign of an infection or stone. Seeing grit or deposit may indicate that you need to change your Foley catheter or irrigate it. If you intermittently catheterize, do it frequently enough to keep the bladder from filling.

Maintaining a regular bowel program can help prevent your bowels from triggering AD. Eat plenty of fiber (fruits and vegetables) to avoid constipation and drink plenty of water. If hemorrhoids are present, be sure they are treated.

Be sure to do pressure reliefs frequently to avoid pressure sores. Check your skin at least daily for sores or other skin problems. Avoid wearing tight clothing and check for sharp or hard objects that can rub or cause pressure, such as buttons on rear pants pockets. Wear sunscreen and prevent long exposure in the sun and avoid extreme hot or cold temperatures.

**Silent Autonomic Dysreflexia**

Research has shown that elevations in blood pressure can occur without the signs and symptoms (asymptomatic) of AD. This condition is called "Silent" Autonomic Dysreflexia. Even if you have never had AD, you can still have an episode of "Silent" AD. Talk to your health care provider if you have any concerns about "Silent" AD.
REMINDE RS
If you experience any signs or symptoms of AD, get into a seated position. Look for a possible cause and remove the irritation. If you can't find a cause or the symptoms continue, seek emergency medical treatment immediately.
Anyone who has a spinal cord injury at or above T6 needs to:

- Know the signs, symptoms, causes and treatment of AD.
- Have equipment available for taking blood pressure and know how to use it.
- Know that if your systolic pressure is greater than 150, you need to seek emergency medical treatment immediately because it can result in a stroke, seizure or death.
- Your health care provider may prescribe medication for you.
- Keep an Autonomic Dysreflexia Medical Alert card with you at all times. Your nurse can give you a card to keep in your wallet.
- Be sure all of your health care providers have information about AD.