

Complications

Complications can be frustrating, costly, and time consuming. The good news is that most of them can be prevented. We've gone into great detail about autonomic hyperreflexia, but the rest of the chapter is divided into body systems and placed in a chart format for easy reference. Some of the problems are small while some are quite serious. The chart format gives you a quick reference to check should you begin to experience some symptoms that you don't think are normal. In the other columns you will find how to prevent and treat complications.

Autonomic Hyperreflexia

Autonomic hyperreflexia (dysreflexia or A.H.) is caused by a mass stimulation of the sympathetic nervous system that causes a compensating mechanism to warn you something is wrong. This reaction is seen only in patients with injuries at or above T-6. A.H. is an **emergency condition** causing very high blood pressure that needs to be corrected immediately. If left untreated, the blood pressure will rise high enough to cause stroke or death. The most common cause of A.H. is an over-filled bladder or bowel.

Signs and symptoms include:

- high blood pressure (higher than your normal BP)
- slow pulse rate
- sudden pounding headache
- excessive sweating above the level of injury
- flushed (red) face
- goose bumps, chills, and pallor (white color)
- nasal congestion
- restlessness
- metallic taste in mouth
- blurred vision

Although the most common causes of A.H. are a full bladder or bowel, other causes include:

- pressure on your skin
- over-stretched muscles
- sexual intercourse
- labor and delivery
- sunburn below your level of injury
- infected ingrown toenail
- exposure to temperatures that are either too hot or too cold

Treatment is aimed at removing the cause

1. Sit up or raise the head of your bed to drop your blood pressure.
2. Catheterize to empty your bladder

NOTE: If you have a foley catheter or suprapubic tube, check for leaks. If there is no urine output, irrigate with normal saline, if unable to irrigate then replace the catheter.

3. Check bowel for stool and remove stool as gently and quickly as possible.

Use anesthetic lubricant, if possible

If the symptoms of A.H. are still present after checking your bladder and bowel, try changing your position to relieve pressure on your skin. Check to make sure you are not lying on any objects. Remove your shoes and anything that might be restrictive. Sometimes wrinkles in your sheets or toes curled in your shoes can even cause A.H.

If A.H. occurs during sexual intercourse, try changing position to relieve the symptoms.

If temperature appears to be the cause, try these suggestions:

If your are too hot

- move to a cooler area
- use an air conditioner or fan
- remove extra clothing
- sponge your body with lukewarm water

If you are too cold

- move to a warmer area
- wear extra clothing

If the cause cannot be removed (labor and delivery for example), or if the symptoms are not relieved after you have tried to remove all possible causes, **you must see a doctor or go to an emergency room for medication.** Clonidine is the usual medication used to treat A.H. in an emergency. If this doesn't work, as a last resort Epidural anesthesia may be needed. If you get A.H. frequently your doctor may start you on preventive medications. Be aware that some over-the-counter medications like Sudafed or other decongestants can cause A.H.

Note: Often health care workers who don't work with spinal cord injury need to be educated about A.H. You should carry a wallet card which gives directions on how to handle A.H. Ask your primary nurse for one! You need to take responsibility to educate others about this potentially life threatening problems.

Bladder Complications

Complication	Definition	Complaints	Prevention	Treatment
Bladder and kidney stones	Urinary waste products that becomes solid in the kidney and bladder which vary in size.	Chills, fever, decreased urine output, blood in urine, pain, A.H., nausea, vomiting.	Follow bladder program. Adequate fluids. Balanced diet. Routine Renal ultrasound, KUB, and/or Intravenous Pyelogram.	Watch for passage of stone. Lithotripsy (a non-invasive treatment to crumble stones). Surgical removal of stone may be necessary. Medication.
Reflux	The reversed flow of urine from the bladder to the kidneys. The ureters enlarge and the kidneys clog with extra urine. Can eventually cause kidney failure.	May not cause any symptoms. May have increased urinary tract infections. Detected by ultrasound or IVP.	Cath every 4 to 6 hours. Never crede unless a catheter is in place. Have annual Renal Ultrasound, KUB, or IVP.	Damage from reflux can not be reversed but further damage can be prevented by maintaining an intermittent cath program. Periodic studies to evaluate bladder and sphincter pressures. Medications.
Urinary Tract Infection	Germs/harmful bacteria in the kidneys, ureters, or bladder. These can be detected in the urine with microscopic examination.	Fever, sweating, chills, foul smelling urine, cloudy or dark urine, increased spasticity, headaches, getting wet between cath, general feeling of sickness, A.H., nausea, vomiting.	Thorough washing of hands and meatus prior to cathing. Follow bladder program. Take medications as prescribed. Adequate fluids. Balanced diet.	Consult your doctor. Have urine tested. Cath more often. Drink more fluids. Take prescribed medications.

Bowel Complications

Complication	Definition	Complaints	Prevention	Treatment
Constipation	Hard to pass stools. Occurs when the stool remains in the bowel for a long time. The result is that too much water is absorbed.	Small or no results from bowel program. Hard or full abdomen. Lack of appetite. Pain in stomach or side. Nervousness. May experience A.H.	Follow principles of good bowel management. Increase fiber and fluid intake (see Nutrition chapter). Medications like Colace.	Repeat daily bowel program until good results. Increase Senokot 1-2 tablets (6 to 12 hours before bowel program). Digitally stimulate and gently remove hardened stool if necessary. Increase fruit, fiber, and fluid in diet. Consider using Colace and Metamucil or Citrucel.
Diarrhea	Frequent passage of loose watery stool. Cause from diet, virus, emotional upset antibiotics or too much Senokot.	Frequent bowel accidents. Stool too loose. (Be sure to check rectum for impaction)	Stop eating irritating foods. Avoid antibiotics that cause diarrhea. Avoid emotional upsets. Regulate Senokot according to bowel program results.	If no impaction stop Senokot and suppositories until diarrhea subsides. Increase fluid intake. See your doctor for medication if problem persists.
Hemorrhoids	Swelling of the rectal veins caused by irritation.	Burning, itching if sensation is present, swelling, bleeding with bowel program.	Remember: digital stimulation should be done gently. Avoid straining with bowel program.	Anusol suppository may be inserted after bowel program. Nupracainal ointment should be used with bowel program if you have pain.
Impaction	Hardened stool that will not move through the bowel	No results from bowel program for several days. May have liquid stool that is leaking around a hardened mass.	Follow principles of good bowel management.	1-4 Senokot tablets or Dulcolax tablets. Dulcolax suppository daily until results. When stool moves into rectum, it may be necessary to break up and remove hardened stool. If you suspect an impaction call the SCI nurse specialist

				for aggressive treatment. Note: an untreated impaction can lead to obstruction.
Obstruction	A surgical emergency. Stool fails to move causing a blocked intestine.	Hard abdomen, shortness of breath, fever, no bowel movement, nausea, vomiting.	Follow principles of good bowel management	See your doctor immediately! Surgery. Don't take any laxatives.
Peptic Ulcer	Erosion of stomach lining by digestive juices. Commonly caused by stress and medications (aspirin, steroids). More common with males, over 40 years old, family tendency, spicy diet and smoking.	Gnawing sensation in upper abdomen or back pain 1-3 hours after a meal, black bowel movements when not taking an iron supplement, may vomit.	Avoid highly seasoned foods and stimulants (coffee, tea coke), and alcohol. Eat 3 regular meals a day plus a snack at night. Find ways to reduce stress, medication (Antacids, Reglan, Prilosec, Tagamet, Zantac)	Follow prevention measures. See your doctor. Reduce stress. Follow diet. Take prescribed medications. (i.e. antacids, Tagamet, Prilosec, Reglan, Zantac)

Orthopaedic Complications

Complication	Definition	Complaints	Prevention	Treatment
Contracture	Joint stays in a fixed position. Caused by not using your muscles or an improper position.	Inability to passively or actively move a joint.	A.D.L.'s, range of motion exercises and proper positioning. Hand splints at night until can do own range of motion. Zimmer splints until sitting 6 hours/day.	Prevention (life long). Splints and casting to stretch muscles. Surgical release of tendons.
Heterotopic Ossification (H.O.)	Extra bone grows around a joint usually the hip or knee. Usually begins within first 12 months after injury.	Swelling, redness, warmth around affected joint with gradual limitation of flexion range.	Range of motion (ROM) exercises, sitting program, and weight bearing as soon as possible after injury may reduce H.O. formation.	Maintain ROM. Surgery may be required for a fixed joint to allow 90 degree flexion. It has a tendency to recur.
Chronic Pain	Various types of pain caused by scarring of the spinal cord or nerve roots. Pain can be felt in any area at or below the level of injury.	"Pins and needles" sensation, numbness, tingling, burning, "electric shocks".	None known. Report complaints to your doctor. Proper position and exercise may decrease the amount of pain felt.	Medication (Neurontin), Surgery, Transcutaneous Electrical Nerve Stimulation (TENS), and/or Multidisciplinary Management using psychology, physical therapy, and medicine.
Post traumatic syringomyelia	A cyst or fluid filled cavity that forms around a previous spinal cord injury usually from scar tissue. A rare complication but if recognized and treated early can stop progression of symptoms.	Progressive loss of motor and/or sensory function, new or different pain that persists, new or different pattern of sweating, increased spasticity, increased autonomic hyperreflexia	Know your body. Be aware of symptoms and notify your SCI physician immediately! If treated early you can halt loss of function and may be able to regain lost function. Be sure to keep your regular SCI follow	Surgical placement of a shunt tube which drains fluid into the chest or abdomen

			up appointments- they may be able to detect subtle changes that you had not noticed.	
Spasms	Uncontrolled movement of the muscles.	Spasms, becoming more severe with bladder & kidney infections, pressure sores, bladder stones, impaction, and contractures. Interference with daily activity.	Daily range of motion exercise can help.	Splints and casting. Maintain range of motion. Medications. Surgery. Baclofen Pump.

Skin Complications

Complication	Definition	Complaints	Prevention	Treatment
Pressure Sores	An area of damaged skin, sometimes involving muscle and bone. Caused by constant pressure which blocks blood flow needed to keep the skin alive.	Varies from red area to open draining ulcer involving muscle and bone.	Check skin. Turn, position or sleep on your abdomen. Weight shifts. Cushion bony areas. Good nutrition. Good skin hygiene. Safety.	Red area: remove pressure, do not sit or lie on red area. Ulcer: need to be seen by your doctor.
Constant Sweating	An autonomic nervous system reflex activity that sometimes occurs in individuals with injuries at or above T6.	Profuse sweating at or above the level of injury.	If not caused by infection or A.H. your doctor can prescribe some medications for you.	Medication. Use absorbent towels and change frequently.
Heat Stroke	Inability to maintain normal body temperature in hot weather.	Headache, blurred vision, dizziness, nausea, dry skin, weakness, irregular pulse, high fever (may develop later), convulsions, sudden loss of consciousness muscle cramping.	Stay out of sun and avoid heavy exercise for long periods of time during 11 AM - 2 PM. Use fans or air conditioning. Increase fluid intake.	Get to a cooler place. Take shower or sponge bath. Increase fluid intake. Call your doctor.

Swelling of Feet	Caused by extra fluid in the feet due to inability to move legs.	Shoes don't fit. Obvious enlargement of feet.	Wear support stocking. Elevate feet or rest in bed if able.	See prevention
Latex Allergy	An allergic reaction caused by latex (natural rubber). Found in rubber gloves, catheters, tourniquets, ace wraps, IV tubing injection ports, and adhesive tape. In the home: balloons, rubber bands, condoms, diaphragms, Koosh balls, etc.	Mild: watery eyes, rash, runny nose, sneezing, hives, slight fever, itching. Severe: facial tingling, warmth, tightness in the chest, wheezing, hives leading to seizures or unconsciousness	Avoid products with latex and substitute with silicone, plastic, or vinyl. If you suspect latex allergy ask your nurse for more information. If known allergy - wear a medic alert bracelet. Check with the manufacturer before using supplies that may contain latex.	Mild: remove latex. Take Benadryl as ordered by doctor. Severe: Remove latex. Epenephrine as prescribed, call 911, go to emergency room.
Ingrown toenail	The edge of the toenail grows into tissue of the toe.	Toe is red and swollen feels warm to touch, pus may be present around ingrown area.	Avoid tight shoes or socks. Regularly cut toenails (straight across). Avoid trauma.	Consult your doctor. Lift the edge of the toenail by packing normal saline soaked gauze under the edge of the toenail until toenail grows longer and skin underneath heals. May be cleaned with peroxide. Change dressing daily.

Blood Complications

Complication	Definition	Complaints	Prevention	Treatment
Embolism	A moving clot. Can travel to the heart or lung and cause sudden death.	Restlessness, apprehension, productive cough for copious thick white secretions, chest pain, short of breath, increased heart rate.	Anticoagulants to thin blood. Exercise, range of motion, anti-embolism stockings	Medications (steroids, anticoagulants), hospitalization, oxygen.
Phlebitis Thrombophlebitis Deep Vein Thrombosis (DVT)	Phlebitis- inflammation of a vein. Thrombophlebitis- Inflammation and a blood clot in vein.	Affected leg is swollen, warm, and firm. Tenderness If able to feel at the location.	see embolism	See you doctor. Depending on location of clot possible hospitalization for IV Heparin followed by 6 months of Coumadin. Possible bed rest. Elevate your leg. Anti-embolism stockings. DO NOT USE HEAT! You may burn your skin without knowing it. DO NOT MASSAGE! You may dislodge the clot. If it frequently reoccurs - may recommend surgical placement of Greenfield filter.
Septicemia	Bacteria in the blood that can come from infected wounds or pressure sores, or from bladder and kidney infections.	Sudden chills, high fever (105 - 106 F), nausea, vomiting, diarrhea, confused & disoriented, low blood pressure, fast pulse rate, cool & clammy skin.	Follow preventive measures described in the Skin Care and Bladder Management chapter.	Recognize the symptoms and go to the hospital for immediate treatment. IV fluids, antibiotics, and medication to reduce fever.

Respiratory Complications

Complication	Definition	Complaints	Prevention	Treatment
Pneumonia	<p>An infection of the lung caused by virus, bacteria, aspiration or inhaling food or liquid into the lungs.</p> <p>NOTE: if you have cervical or high thoracic injury you are at a greater risk for pneumonia due to poor chest expansion.</p>	<p>Increased respiratory rate, difficulty breathing, and persistent productive cough of yellow or green mucus, chest pain, fever, chills, bluish lips or nails.</p>	<p>Drink plenty of fluids, take deep breaths, exercise, turn every 2 hours, don't smoke, get yearly flu shot, use a humidifier.</p>	<p>Antibiotics, chest percussion therapy, postural drainage, incentive spirometer, quad cough (for patients with cervical injuries), increase fluid intake. If severe will need hospitalization for I.V. antibiotics, Intermittent positive pressure breathing (IPPB), suction, oxygen.</p>

Drug and Alcohol Abuse

Sometimes people with spinal cord injury may turn to alcohol and drugs to relieve the overwhelming physical and emotional devastation brought about by a spinal cord injury. Unfortunately, this is a path to additional problems. Alcohol and drugs actually cause depression and poor judgment. The use of alcohol and drugs makes you forgetful and neglectful which in turn makes you less attentive to your physical care. You may forget to cath, do weight shifts, or check your skin. This may lead to complications such as increased bladder and kidney infections, pressure sores, contractures of joints, and respiratory problems. You may experience more problems because you may also be impulsive and forget safety practices. Your balance may be impaired which could increase the risk of falls or burns. Alcohol or drug abuse may increase the effect of other drugs you are taking like Valium, or Lioresal and may make you drowsier or even be fatal. The abuse of alcohol or drugs changes the way you interact with people and causes stress in your relationships with family, friends, and caregivers. Soon you find people avoiding you, you may jeopardize your job security, and eventually you lose your self respect.

Substance abuse is serious. If you had an addiction prior to your injury the chance of it becoming a problem after your injury is very high. Because drug and alcohol abuse will seriously impair your rehabilitation we recommend you be admitted to either an inpatient or outpatient treatment program. The first step is admitting you have a problem; the next is making that phone call to get help. It will be worth it.

To start, check you phone book for local drug and alcohol treatment centers. When you call check to see if they have experience with people with disabilities and whether their facilities are wheelchair accessible. You can also check with our outpatient Spinal Cord Injury Nurse Specialist at 717-531-7010 for references or call:

Intensive Outpatient Drug and Alcohol Treatment Program
University Recovery Center
Penn State Milton S . Hershey Medical Center (717-531-8338)

This program provides individual treatment on an outpatient basis. They will see you two to three evenings a week for 3 1/2 hours using education, group, and individual therapy. You may need a detoxification program before starting.

As you age...

You may find that you fatigue more easily and need both to conserve energy and rest more often. This happens to the general population too, but it may come sooner for you. You may find it harder to balance work, family, exercise, and social events. Be organized, prioritize the events that are most important to you, and be creative with taking time to rest.

You may notice your bowels becoming more sluggish, so you may need to be more careful about adding fiber and fluids to your diet and stay as active as possible to keep your bowel movements regular. A change in medication or suppository, like Theravac, may also help. Try adjusting your bowel program to a time following increased activity.

Be careful not to misuse or over-use your joints. If you develop shoulder pain or discomfort without swelling, your doctor may recommend medication like Ibuprofen or Tylenol and physical therapy. Sometimes just adding a sliding board for transfers or switching to an electric wheelchair may help preserve joint function.

Skin is drier and thinner as you age, so remember to use lotion and do frequent weight shifts. Take extra care to stay off of red skin. Make sure new cushions fit properly, and check your skin more frequently.

If you are dependent on caregivers it is advisable to set up an alternative plan to cover situations when your caretaker is unable to provide care for you. You may want to contact social services for recommendations.

In general, statistics say if you take good care of yourself you can expect a normal lifespan and a good quality of life. Some report a greater appreciation of friendships, nature, and life.

Prescription for taking care of yourself

You've been reading about common problems that *may* arise and how to deal with the different systems of your body. You've learned how to take care of your bladder bowel and skin. You learned transfers, and different ways to dress, bathe, and drive. We are not trying to minimize the enormity of the changes a spinal cord injury makes in your life. But, after you learn these things and they become a routine part of your life you can follow general guidelines for a healthy life.

Eating right, regular exercise, rest and relaxation are all important to your general health. You do need to develop an extra sixth sense that will keep you alerted to possible problems but a healthy lifestyle will make problems less likely to occur.

Prescription	Recommendation	Benefits
Eat Healthy	Well balanced meals - low fat diet, high fiber, adequate fluid, watch chocolate and caffeine. Stay slim. Extra Vitamins may be recommended.	Improves skin. Prevents bladder infections. Maintains good bowel movements. Decreases chance of heart problems.
Regular Exercise	ROM, ADL's, Exercise 3 times/week for 30 minutes. Warm up and gradually increase strength for sports, swimming, racing, etc. Functional Electrical Stimulation (FES) may enhance muscle use.	Prevents contractures and overuse or misuse of joints. Decreases spasms. Decreases chance of Heterotopic Ossification, heart problems, and thrombophlebitis. Increases respiratory capacity and decreases respiratory problems. May increase functional capacity.
Rest and Relaxation	Remember to do weight shifts. Make sacrifices for skin (when you have a red area stay off it). Talk with others, join a support group, be involved in sports or recreational activities, go out to dinner, go on a vacation, get involved with work or community activity. Have a good laugh whenever you can. Think positively.	Prevents skin breakdown. Prevents overuse of shoulders and arms. Prevents depression. Reduces stress. Makes you feel good about yourself.
Be Observant	Check your skin. Check your joint mobility. Listen to your bodies warning signs (i.e. hard stool, foul smelling urine, increased spasms, fatigue, swollen feet, irritability).	Early intervention can prevent skin breakdown, contractures, damaged kidneys, bowel obstruction.

Protect Yourself	<ol style="list-style-type: none"> 1. Use wheelchair gloves. Check water temperature. Change wet clothes. 2. Wear sunscreen. Stay out of sun during the hottest part of the day. 3. Don't smoke and get a yearly Flu shot (especially quadriplegics). 4. Pain is often a warning. Learn to listen to your bodies warning signs and take action. 5. Use good posture and body mechanics. Use a well fitted wheelchair and wheelchair cushion. 6. Avoid street drugs and alcohol abuse. 7. Use splints as necessary. 8. Become familiar with complications. 	<ol style="list-style-type: none"> 1. Prevents skin breakdown. Keeps skin from getting too moist and protects skin. 2. Prevents heat stroke and decreases chance of serious sunburn. 3. Smoking causes blood vessel constriction and decreases respiratory capacity, so quit smoking and improve your circulation, increase your respiratory capacity, and decrease your chance of respiratory infections. 4. Pain may be alleviated or decreased in severity. 5. Decreases stress on joints. Better respiratory function, reduced fatigue, and more energy. Prevents skin breakdown. 6. Taking drugs and alcohol is a fast road to NOWHERE. 7. Decreases spasms. Prevents foot drop. Supports weak muscle or stretches contracted muscles. 8. Helps you recognize problems and take appropriate action.
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