

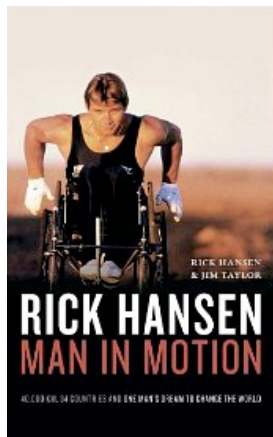
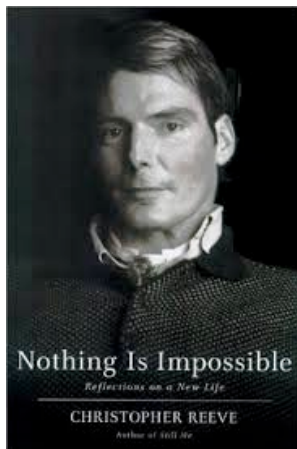
5.3 Spinal Injuries

- There are over **86,000 people living with SCI** in Canada
- It is estimated that there are over **4,300 new SCI cases** in Canada each year
- Approximately **51% of Current SCI cases** are the result of traumatic injury (accident)
- Approximately **49% of Current SCI cases** are the result of non-traumatic injury (disease)

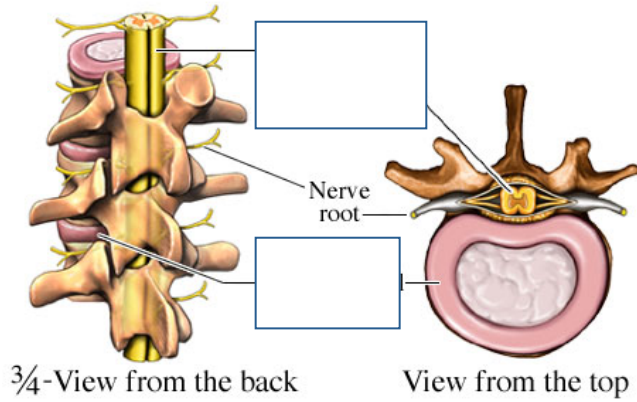
<http://sci-can.ca/resources/sci-facts/>

Examples:

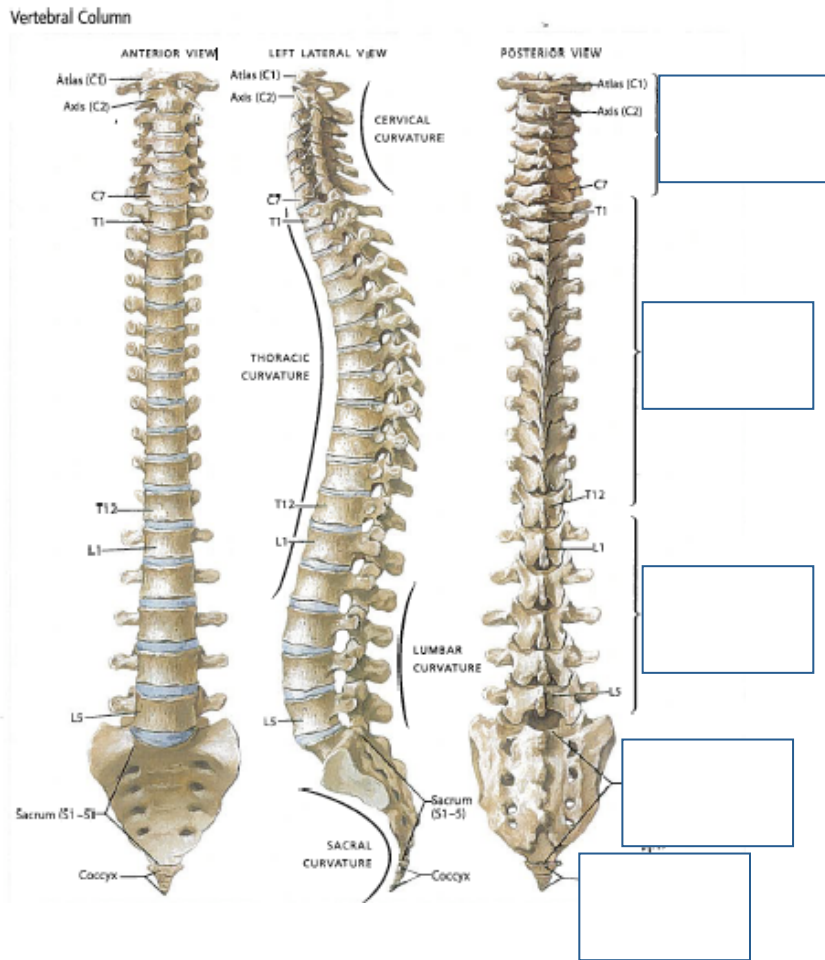
Christopher Reeves
Rick Hansen
Joni Tada
Sam Sullivan
Dan Coulter



A. Difference between the Spinal Cord and the Spinal Column



B. The sections of the spinal column



A Cervical Spinal Injury can result in _____.

A Lumbar Spinal Injury can result in _____..

Spinal Injury Management

History of a Spinal Injury

- Car accident
- Shallow water dive
- Head or neck trauma
- Fall from height
- Un-witnessed unconscious

Signs and Symptoms of a Spinal Injury

- Pain with or without movement
- Point Tenderness
- Deformity/ Cuts and Bruises
- _____
- Loss of Bowel/Bladder control
- Priapism (Males only)
- Numbness and tingling

Treatment of a Spinal Injury

Principle #1: Maintain _____.

Principle #2: Immobilize _____

(roll to prone only if patient is not breathing. Maintain immobilization throughout)

- EMS
- Oxygen/Airway
- Blanket
- Secondary Survey
- Monitor Carefully

THE "GUPPY BREATHER":

A high-level Cervical Spinal Injury (C3, C4, C5) can result in paralysis of the diaphragm. This can leave the victim conscious but unable to breathe on their own. Therefore, you may have to ventilate a conscious patient in this condition.

Remember:

" _____ "

. You must ventilate a conscious patient in this condition.

Effects of Spinal Injury

Level of Injury	Effect*
CERVICAL	
Between C1 and C5	Paralysis of some or all muscles used for breathing and all arm and leg muscles Typically, fatal unless a ventilator is used
Between C5 and C6	Paralysis of the legs, trunk, hand, and wrist Weakness of the muscles that move the shoulder and elbow
Between C6 and C7	Paralysis of the legs, trunk, and part of the wrists and hands Normal movement of the shoulders and elbows
Between C7 and C8	Paralysis of the legs, trunk, and hands
THORACIC	
C8 to T1	Paralysis of the legs and trunk Weakness of the muscles that move fingers and hands Horner's syndrome (with a drooping eyelid, a constricted pupil, and reduced sweating on one side of the face) Possibly normal movement of the shoulders and elbows
T2 to T4	Paralysis of the legs and trunk Loss of sensation below the nipples Normal movement of the shoulders and elbows
LUMBAR	
T5 to T8	Paralysis of the legs and lower trunk Loss of sensation below the rib cage
T9 to T11	Paralysis of the legs Loss of sensation below the navel
T11 to L1	Paralysis of and loss of sensation in the hips and legs
SACRAL	
L2 to S2	Various patterns of leg weakness and numbness, depending on the precise level of injury
S3 to S5	Numbness in the perineum

* At any level of the spinal cord, severe injury can cause loss of bladder and bowel control.

Practical Skills

1) Spinal Clamps



Trap Clamp

Long-Short Clamp (one hand on forehead)



Jaw Thrust

2) Spinal Rolls



3) Spinal Takedown



Unconscious Patient Checklist

Priority #1: Scene Assessment

- Stop and look (*walk around patient and look up and down*)
- Assess for hazards (*gas, glass, fire, wire, trucks, shmucks*)
- Find out what happened (*what happened?*)
- Exposure Protection (*put on your gloves*)

Priority #2&3: Primary Survey and EMS Call

- LOC Check: (*Pinch and Shout*)
- Phone 9-1-1 and get AED
 - Get someone else to phone 9-1-1 now.
(*Hey you! go phone 9-1-1 and report back to me*)
 - Get someone else to look for an AED
(*Hey you! go look for an A.E.D. and report back to me*)
- d-Spine: do I need to hold the neck still?
(*if you need to immobilize the neck, use one of the clamps we learned and/or find some sand bags*)
- ABC's: head tilt, chin lift, check for effective breathing (5 seconds)
If breathing, then
- RBS: check patient for
 - **D**eadly bleeding
 - **E**scaping Air
 - **M**ajor Fractures
 - **M**edical Conditions

Priority #4: Treat for Shock

- Oxygen Therapy (if available)
 - Unconscious patient that does not respond to voice should get an oral airway
 - Breathing patient should get simple face mask at 10 lpm
- Warmth: get a blanket for the patient
- ABC's: continue to monitor breathing as often as possible
- Rest and Reassure: stay calm and talk to patient
- Treatment: treat any injuries they may have
- Suitable Position: unconscious patient should be placed in $\frac{3}{4}$ prone (unless d-spine applies)

NOTE: If the patient is unconscious, you must monitor breathing as often as possible. As soon as it appears to become ineffective or stop completely, then it is time to start CPR immediately.

NOTE: if you are by yourself and need to phone 9-1-1, then either use your cell phone or if you have to leave the patient, just roll them onto their side ($\frac{3}{4}$ prone) first.

Conscious Patient Checklist

Priority #1: Scene Assessment

- Stop and look (*walk around patient and look up and down*)
- Assess for hazards (*gas, glass, fire, wire, trucks, shmucks*)
- Find out what happened (*what happened?*)
- Exposure Protection (*put on your gloves*)

Priority #2&3: Primary Survey and EMS Call

- LOC** Check: "What happened?" (*assess to see if patient is alert and oriented*)
- d-Spine**: "Did you fall or hit your head?" (*if mechanism of injury is likely to have caused a neck injury, then hold the head still until paramedics arrive*)
- ABC's**: "How is your breathing" (*if breathing is ineffective, then stop and treat it immediately (and phone 911)*)
- RBC**: "Are you hurt anywhere else?" "Do you have any medical conditions?" (*if you find any life-threatening problems then treat it immediately*)

Priority #4: Treat for Shock

- Look for Signs of Shock and call 911 if necessary:**
 - 1) *Pale Skin*
 - 2) *Cool Temperature*
 - 3) *Clammy/sweaty Skin*
 - 4) *Cyanosis (blue extremities)*
 - 5) *Numbness and Tingling in the extremities*
 - 6) *Confusion and decreased LOC*
- Warmth (blanket)
- Rest and Reassurance
- Oxygen Therapy (if available)

4.3 Unconscious Spinal Patient

Adult CPR Steps	Below Standard	Minimal	Fully Meets Standard	Above Standard
Check for Dangers	<i>Does not verbalize "checking for dangers"</i>	<i>Says "checking for dangers" but doesn't really look</i>	<i>Takes time and verbalizes "checking for dangers". Identifies any possible dangers.</i>	<i>Takes time and verbalizes "checking for dangers". Identifies and deals with any possible dangers.</i>
Find out what Happened	<i>Doesn't ask "what happened?"</i>	<i>Asks "what happened?" but doesn't listen or waits too long.</i>	<i>Asks "what happened?" and waits just long enough find out the basic history.</i>	<i>Asks "what happened?" with assertiveness and projects confidence in finding out the basic history.</i>
Gloves	<i>Forgets to put them on</i>	<i>Puts them on at the wrong time</i>	<i>Puts gloves on before touching patient</i>	<i>Puts gloves on efficiently before touching patient.</i>
LOC Check	<i>Skips this step</i>	<i>Does only pinch or only shout.</i>	<i>Pinch and shout</i>	<i>Pinch and shout in both ears with reasonable volume and firmness.</i>
Phone 9-1-1 and get AED	<i>Forgets to do this, or more than 1 minute after starting</i>	<i>Phones late or forgets AED</i>	<i>Gets someone to phone 9-1-1 at the right time, and sends for an AED</i>	<i>Has confidence and clarity in getting someone to phone 9-1-1 and get an AED</i>
d-Spine (x2)	<i>Forgets to hold rest, or moves the head in the attempt</i>	<i>Attempt to hold the head still, but it seems insecure. Slight movement that is not outside of neutral position.</i>	<i>Holds the head securely, and elbows are stable.</i>	<i>Holds the head immediately and securely with a trap clamp or long short clamp. Elbows are stable.</i>
ABC's	<i>Either not checking or is less than 4 seconds or more than 10.</i>	<i>Checks for breathing for 4-10 seconds.</i>	<i>Opens the airway with a jaw thrust and checks for breathing for 5 seconds.</i>	<i>Opens the airway with a jaw thrust and checks for breathing for 5 seconds. Verbalizes look/listen/feel</i>
Spinal Roll <i>Either prone to supine roll or vomit roll required (x3)</i>	<i>Roll not attempted when required, or immobilization not maintained.</i>	<i>Either insecure immobilization or very slow roll or poor communication</i>	<i>Immobilization maintained as best possible while doing a quick roll</i>	<i>Immobilization maintained throughout quick roll with excellent communication to helper</i>

RBS	<i>Rapid Body Survey not done</i>	<i>Checked for deadly bleeding</i>	<i>RBS is either not thorough, or takes longer than 15 secs.</i>	<i>Thorough check for deadly bleeding, escaping air, fractures, and medical conditions in less than 15 sec.</i>
Oral Airway	<i>No Oral Airway</i>	<i>Airway may be one size off, or not explicitly sized/checked</i>	<i>Airway is sized correctly, and checked for effectiveness</i>	<i>Airway is sized correctly, *pretend* inserted correctly, and checked for effectiveness</i>
Oxygen	<i>No Oxygen</i>	<i>Oxygen is turned on, but may be incorrectly applied</i>	<i>Oxygen is turned on, and Simple Face Mask applied with 10 lmp flow</i>	<i>Oxygen is confidently turned on, and Simple Face Mask applied with 10 lmp flow.</i>
Warmth	<i>No Blanket</i>	<i>Blanket is given, but it is late or improperly done</i>	<i>Blanket is applied but doesn't cover the whole body</i>	<i>Blanket is given that fully covers body</i>
ABC's	<i>Breathing is not reassessed consistently</i>	<i>Breathing is reassessed close to every minute</i>	<i>Breathing is constantly reassessed at least every minute.</i>	<i>Breathing is constantly re-assessed between most steps</i>
Rest & Reassurance	<i>No reassurance</i>	<i>Patient is reassured once, and not moved unnecessarily</i>	<i>Patient is reassured, and not moved unnecessarily</i>	<i>Patient is consistently reassured, and not moved unnecessarily</i>
Treatment				
Semi-prone position				<i>Not done because of risk to the neck.</i>
Knowledge	<i>Incorrect or did not attempt answer</i>	<i>Partially correct</i>	<i>Correct answer, but slow or uncertain.</i>	<i>Quick clear concise answer to "what if" question</i>

Spinal Injury Management

The principles of any spinal injury are immobilization and ABC's. Regardless of the technique you choose, You must ask yourself, "Am I maintaining proper immobilization and am I keeping this person alive?" If you can answer yes to both questions you have met the principles.

A Cervical Spinal Injury can result in **quadriplegia**.

A Lumbar Spinal Injury can result in **paraplegia**.

History of a Spinal Injury

- Shallow water dive
- Head or neck trauma
- Car Accident
- Fall from height
- Un-witnessed unconscious

Signs and Symptoms of a Spinal Injury

- Pain with or without movement
- Point Tenderness
- Deformity/ Cuts and Bruises
- Loss of Bowel/Bladder control
- Priapism (Males only)
- Numbness and tingling
- Paralysis

Treatment of a Spinal Injury

- Immobilize in position found (roll to prone only if patient is not breathing. Maintain immobilization throughout)

- ABC's
- EMS
- Oxygen/Airway
- Blanket
- Secondary Survey
- Monitor Carefully

THE GUPPY BREATHER:

A high-level Cervical Spinal Injury (C3, C4, C5) can result in paralysis of the diaphragm. This can leave the victim conscious but unable to breathe on their own. Therefore, you may have to ventilate a conscious patient in this condition. Remember: "C3,C4,C5 – Keep the Diaphragm Alive". You must ventilate a conscious patient in this condition.