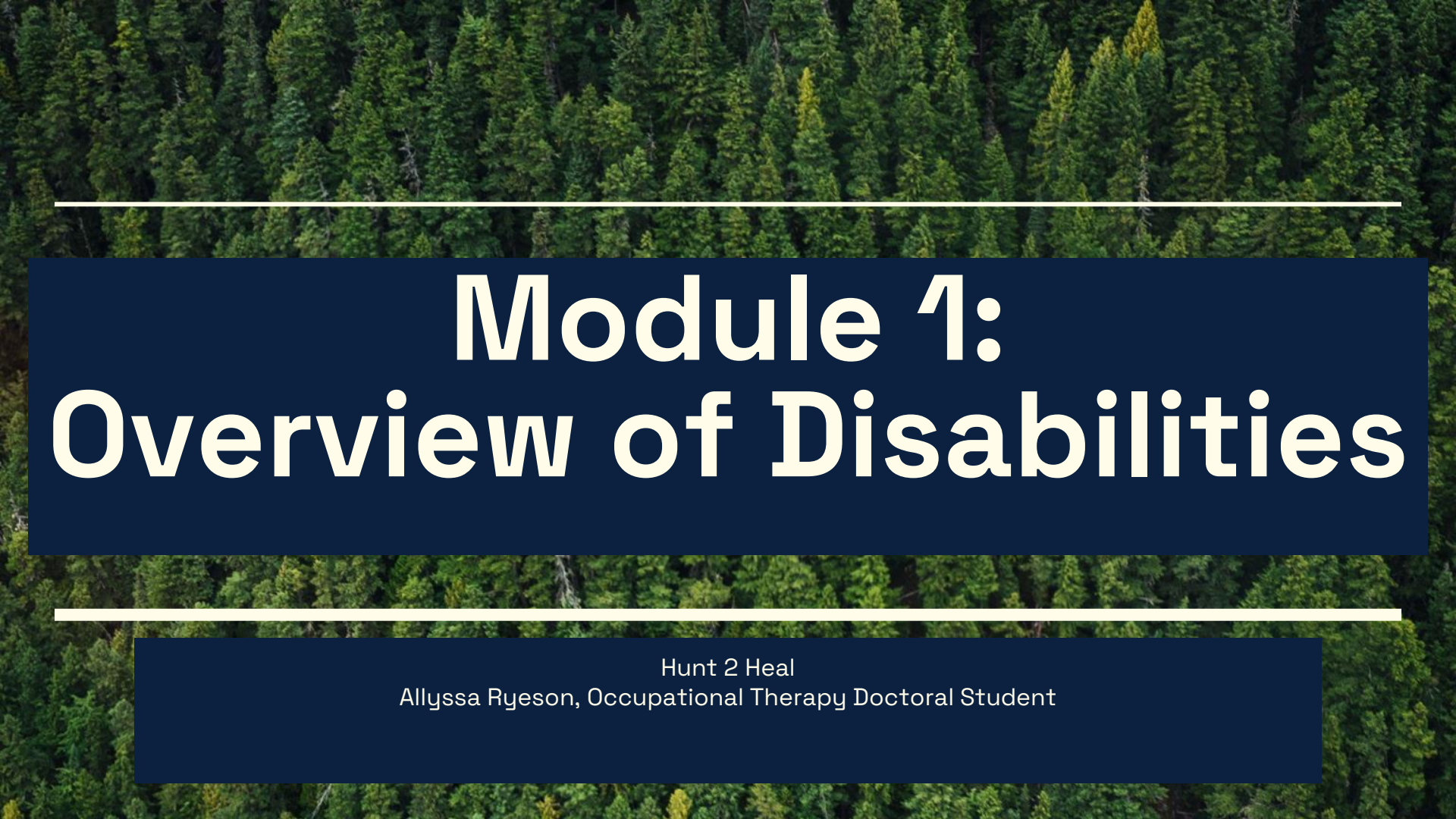




Module 1: Overview of Disabilities

Hunt 2 Heal
Allyssa Ryeson, Occupational Therapy Doctoral Student

Spinal Cord Injury (SCI)

Complete vs. Incomplete Injury

Complete: No signals from the brain are making it to the end of the spinal cord.

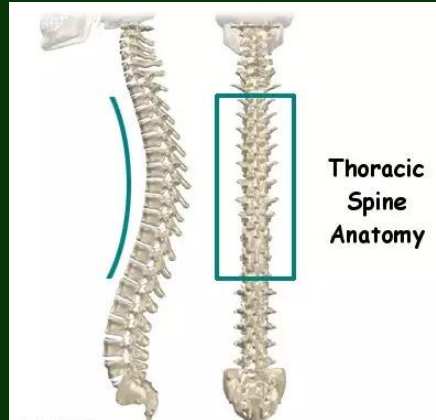
Incomplete: Some signals are making it to the end but not all possibly allowing for some preserved sensation and/or motor control.

(Shirley Ryan Ability Lab, 2023)

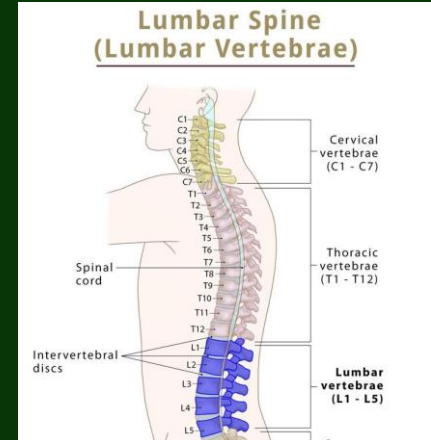
Cervical (C1-C7)



Thoracic (T1-T12)



Lumbar (L1-L5)



Cervical Spine

Each SCI is different and even if two people have the same level of SCI, they will present similarly but not always the exact same. Generally, the higher the SCI, the less function and sensation are present. Everything below the level of injury is affected. The cervical spine supplies sensation and function to the head, neck, shoulder, arms, and hand region (most severe form of SCI).

C1-C4 Injury

- Tetraplegia AKA Quadriplegia (limited/absent movement or feeling below the neck)
- Impaired or inability to speak
- Injuries above C3 will cause impairment to the diaphragm likely requiring a permanent ventilator to breathe

C5 Injury

- Can raise arms and bend elbows
- Some or total paralysis of wrists/hands
- Can speak and use diaphragm but breathing is still weakened

Cervical Spine Cont.

C6 Injury

- Wrist extension affected but wrist flexion possible
 - Breathing still weakened

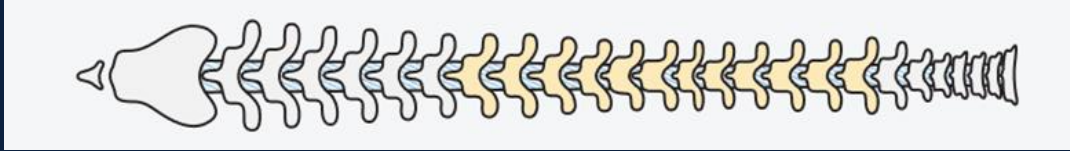
C7 Injury

- Elbow extension and some finger extension affected
- Most people are able to straighten arms and move shoulders

C8 Injury

- Some hand movement still affected
- Likely can grasp and release objects

Thoracic Spine



The thoracic spine supplies sensation and function to the chest, back, and abdomen region.

T1 Injury:	Still considered quadraplegic as all 4 limbs are affected.
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T2-T5 Injury:	Arm and hand function is likely unaffected. This is now considered paraplegia because only the trunk and legs are affected.
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T6-T12 Injury:	Upper body movement is likely unaffected and seated balance/trunk control is fair to good.
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Lumbar Spine

The lumbar spine supplies sensation and function to the lower back, hips, and legs.

L1-L5 Injury:

Some loss of function in the hips and legs. A wheelchair may no longer be required 24/7 depending on severity of the injury and strength in the legs.



Sacral Spine

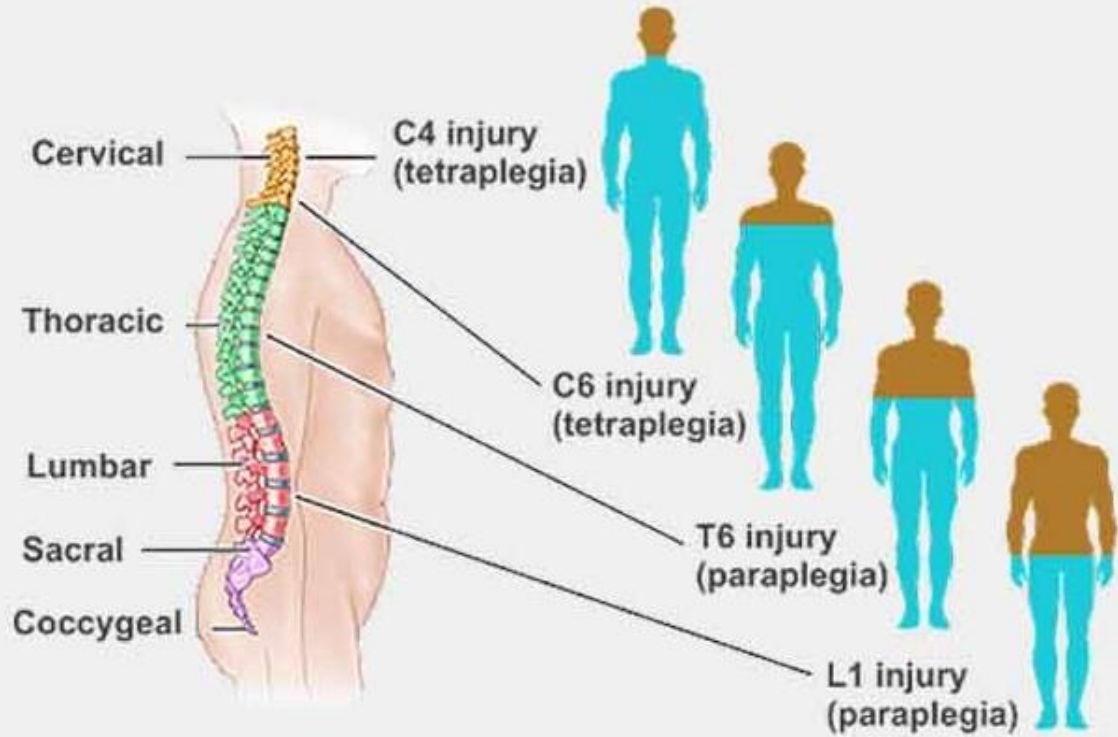
Supplies sensation and function to the lower legs and bowel/bladder (least common SCI as this area of the spine is more protected).

S1-S5 Injury:

- Walking is very possible for these individuals as usually only lower legs are affected.
- Individuals still have little or no bowel/bladder control.

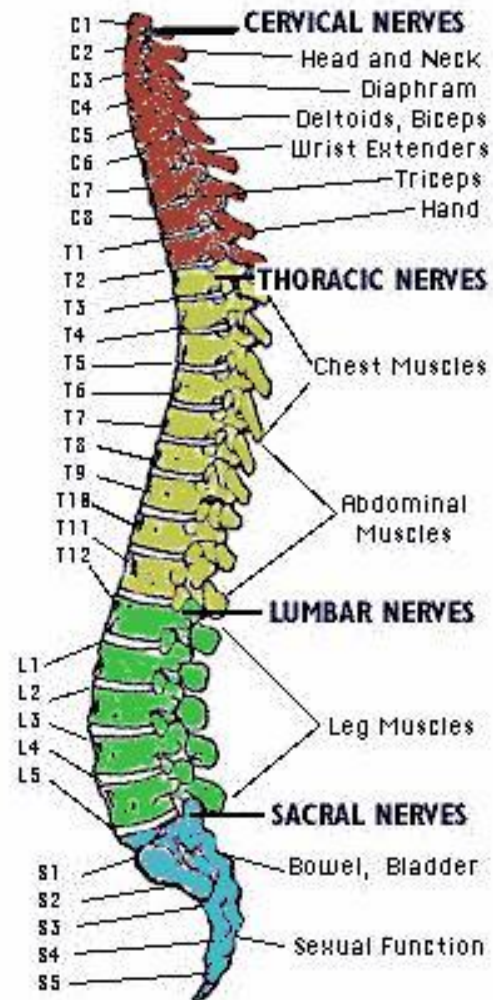


S U M M A R Y



Spinal Cord Injury

S U M M A R Y



Amyotrophic Lateral Sclerosis (ALS)

Condition of the nervous system that causes degeneration of nerve cells/motor neurons in the brain and spinal cord causing a loss of control/inability to move one's muscles (weakness/paralysis). This occurs due to the brain's inability to communicate with the rest of the body.

○ Progressive disease:

Gets worse over time.

○ Affects the muscles needed to move, speak, eat, and breathe.

Differs from person to person and can progress differently but will eventually hinder a person's ability to stand/walk, use their arms/hands, speak/eat, and breathe.

○ Life Threatening:

Mean survival time is 2-5 years from diagnosis however some people survive up to 5-10 years.

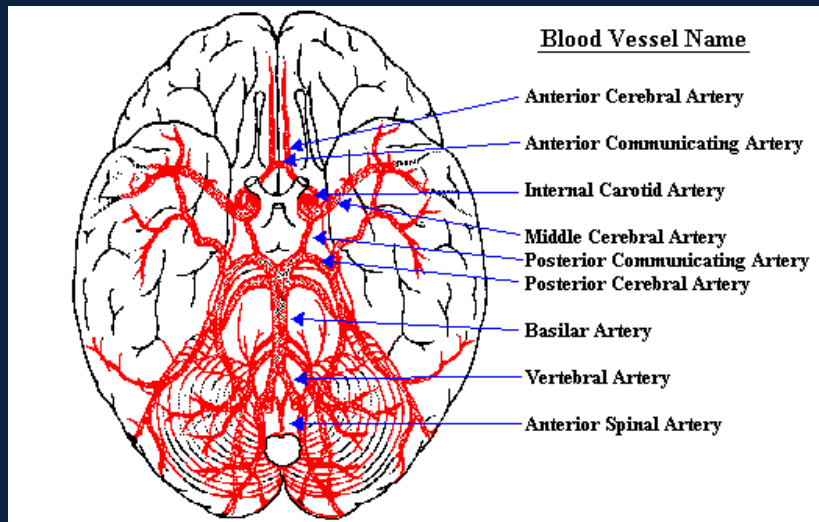
Cerebrovascular Accident (CVA)

Also known as Stroke

Ischemic vs Hemorrhagic Stroke

- Ischemic (most common): Blood vessels in the brain become blocked or narrowed by fatty deposits OR blood clots which limits blood flow to the brain.
- Hemorrhagic: Blood vessels in the brain rupture or leak causing bleeding in the brain.

(Brown, 2024)



Cerebrovascular Accident

Presentation of a stroke differs from person to person and the amount of function regained post accident depends on the amount of time blood flow was restricted to the brain and individual factors.

Left Sided Stroke

- Paralysis and sensory changes on right side of body.
- Speech and language can be affected.
- Abstract thinking affected leading to problems with overall processing and memory.

Right Sided Stroke

- Paralysis and sensory changes on left side of body.
- Vision can be affected.
- Spatial thinking (imagery) and short term memory can be affected.

Spinal Cord Stroke

- Paralysis and sensory changes on both sides of body.
- Presents similar to a SCI at level of injury. However, some function can be restored depending on severity of damage and individual factors.

Brain Stem Stroke

- Considered most life threatening as the brainstem controls vital functions such as breathing, swallowing, heart rate, and consciousness.
- Can cause mild weakness on one side of body to total paralysis depending on location.

Spina Bifida

There are multiple types of Spina Bifida but the types you will most commonly see at Hunt 2 Heal are listed below.

A birth disorder that occurs when the spine is unable to fully develop/close leaving an opening along the spine for possible damage to the spinal cord and nerves. This can also lead to developmental issues with the brain. Each person with spina bifida has different levels of function both physically and cognitively. Some individuals will have nerve damage leading to sensory and functional deficits whereas others may have developmental and/or intellectual disabilities.

Closed Neural Tube Defects:

The spine has abnormal fat, bone, and protective layers that cover the spinal cord often resulting in leg weakness/decreased sensation and inability to control bowel/bladder. This can be progressive and get worse as time goes on.

(National Institute of Neurological Disorders and Stroke, 2025)

Myelomeningocele:

Most severe form

The opening in the spine exposes the spinal cord and/or nerves through a sac that sticks out from the spinal cord. The higher the opening on the spine, the more severe symptoms usually are (similar to SCI). This often results in issues with brain structure and learning disabilities, leg weakness/decreased sensation, and bowel/bladder problems.

Multiple Sclerosis (MS)

Chronic disease of the central nervous system where the body attacks itself by mistake. The body attacks the substance that protects nerve fibers leading to scar tissue and damaged nerves. This negatively impacts the communication to and from the brain and other areas of the body. Each person with MS presents differently but it often leads to vision, fine motor, speaking, and cognitive problems, inability to walk, and more.



Relapsing Remitting

Individuals will have relapses where symptoms get worse followed by a recovery period where improvements are seen. After each relapse, the disabilities may end up worse because the body must work harder to repair the damage that occurred. This is the most common



Secondary Progressive

An individual's disability progressively gets worse over time with no periods of relapse or recovery. Relapsing remitting can transition into secondary progressive which is why it has the name "secondary."



Primary Progressive

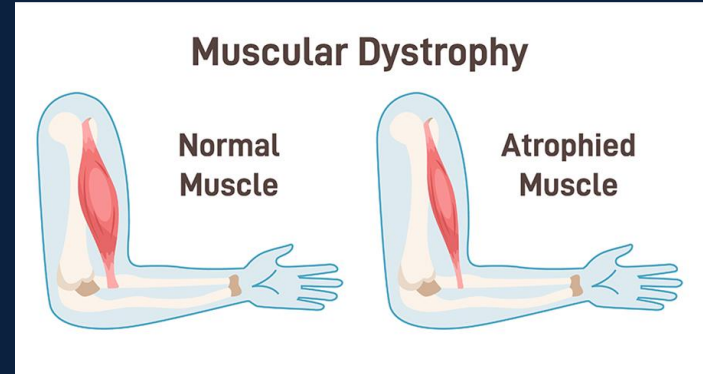
An individual's disability is progressive from the very first onset of symptoms and these individuals won't experience any remission/recovery periods.

Muscular Dystrophy (MD)

A progressive genetic disorder that causes **muscle weakness** and **loss of muscle mass**. There are many different types of MD and some of the specialized types can also lead to **heart problems, a decrease in the muscles needed to breathe, and cognitive impairment**. It often starts by affecting a particular group of muscles and then spreads throughout the body leading to increased level of disability.

Many types of MD present early in childhood whereas others may take longer to present. Some types of MD also significantly reduce the lifespan of individuals affected. Many individuals who have MD will require a wheelchair for mobility – less severe forms may not require a wheelchair until adulthood. For specific clients with MD, it is important to understand what type and how it affects their function personally as it varies largely from person to person.

(U.S. Centers for Disease Control and Prevention, n.d.)



Parkinson's Disease (PD)

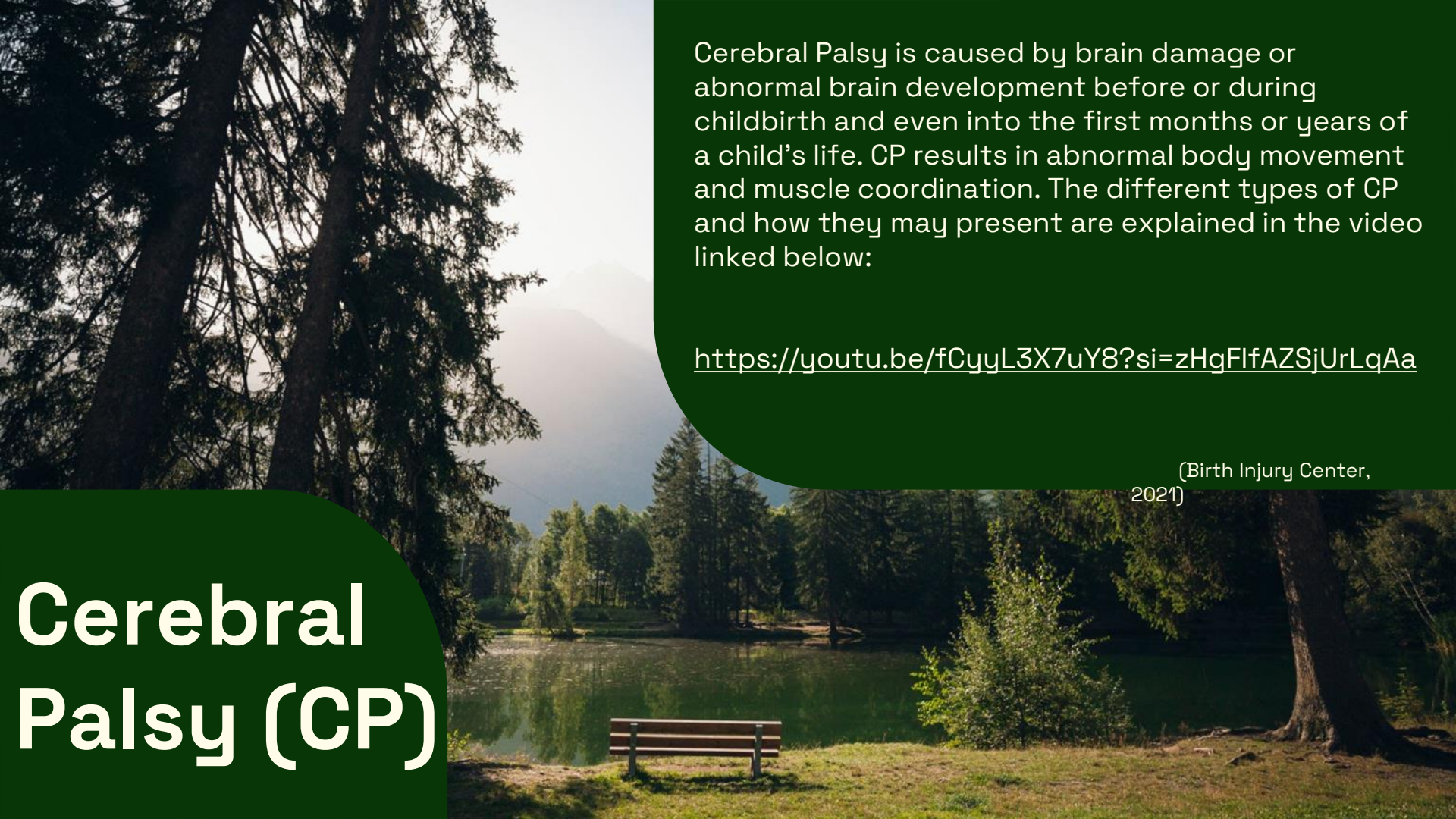
A condition that causes a part of the brain (basal ganglia) to deteriorate. Individuals with PD do not have enough dopamine (neurotransmitter) which leads to slowed movements, balance problems, stiffness, and tremors while at rest. This is also a progressive disease so it gets worse overtime and can eventually cause dementia-like symptoms and depression. The chances of developing PD increase with age (average age of onset is 60 years old).

Other associated symptoms:

Loss of sense of smell, trouble swallowing, drooling, soft speaking and/or less control of facial muscles

Sleeping problems

Blood pressure, gastrointestinal, and incontinence problems



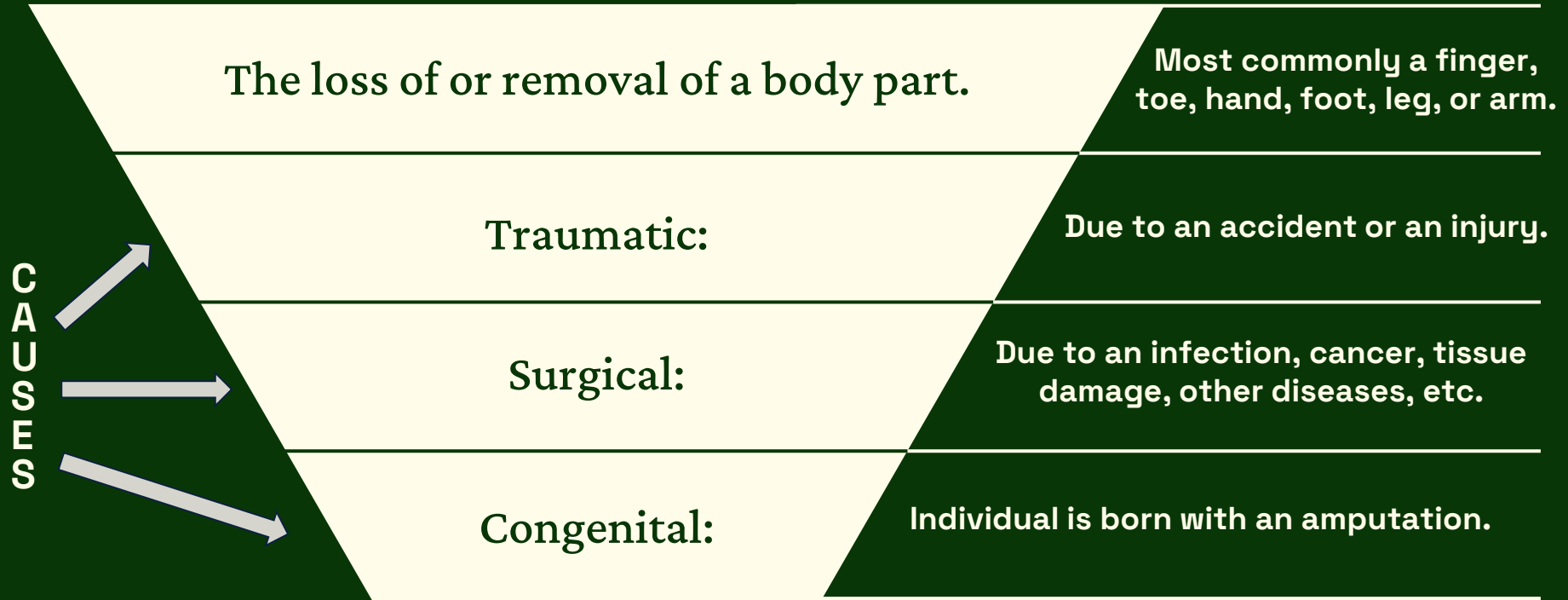
Cerebral Palsy is caused by brain damage or abnormal brain development before or during childbirth and even into the first months or years of a child's life. CP results in abnormal body movement and muscle coordination. The different types of CP and how they may present are explained in the video linked below:

<https://youtu.be/fCyyL3X7uY8?si=zHgFlfAZSjUrLqAa>

(Birth Injury Center,
2021)

Cerebral Palsy (CP)

Amputation



Complications Experienced After an Amputation



Phantom Limb Sensation & Phantom Limb Pain:

This occurs when the individual has the sensation that their limb is still there or experiences severe pain in the area where the limb would be despite it no longer being there.

Visual Impairments

Legally Blind

- Level of vision that makes an individual eligible for benefits.
- Central visual acuity of 20/200 or less in the better eye with corrections AND/OR a visual field of 20 degrees or less.
- Often still have some level of usable vision.

Low Vision

- Vision is measurable.
- Individual still has difficulty/some inability to accomplish visual tasks even with the help from corrective lenses.
- Compensatory strategies, environmental modifications, and low vision devices help to improve independence.

Total Blindness

- The inability to see anything with both eyes.
- Require Braille, audio recordings, etc.

(American Foundation for the Blind, 2024)

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