

EAGLE MOUNT - BOZEMAN
INSTRUCTOR/VOLUNTEER TRAINING

PHYSICAL DISABILITIES

AMPUTATIONS AND LIMB DEFORMITIES

Definition: A loss of one or more extremities

Causes:

1. Congenital

- a. Disease
- b. Drugs
- c. Toxins

2. Accident

3. Surgically Removed

- a. Trauma
 - 1. Accident
 - 2. Burns
- b. Diseases
 - 1. Diabetes
 - 2. Necrosis
 - 3. Cancer

Primary Anatomical Designations:

A.K. - Above the Knee A.E. - Above the elbow
B.K. - Below the Knee B.E.- Below the elbow

Symptoms/Characteristics:

1. Possible loss of sensation
2. Possible stump soreness
3. Posture often affected
4. Contiguous muscle weakness
5. Occasional depression- common with phantom limb pain (secondary condition)
6. Frustration with decreased ability
7. Loss of balance or balance sensation
8. Loss of symmetry
9. Phantom limb pain or sensation- most commonly with trauma losses, less with diverticulation

Teaching Considerations and Management:

1. Watch for stump soreness
2. With or without prosthesis: you and the rider decide (May cause rubbing)
3. Very important to help develop balance
4. Emphasize posture
5. Work with what's left

6. Give psychological support when rider “feels” off balance or insecure

Horses:

1. Suitable to match limb loss (i.e., if missing an arm, horse needs to neck rein)

Equipment:

1. May need to weight saddle (i.e.: on side of missing limb)
2. Sheepskin or sponge may be used to protect stump or limb, if needed
3. Consider an Australian Stock saddle, or a Western saddle or a Dressage saddle if A.K.
4. Adapt equipment
5. Do not hook reins into hooks

ARTHROGRYPOSIS

Definition:

A non-progressive congenital neuromuscular syndrome in which joints are deformed due to severe joint contractures, muscle weakness, and fibrosis. Arthrogryposis occurs in 1 out of every 3,000 live births. Upper extremities are most often affected and usually, but not always, in a flexed or fetal position.

Causes:

1. Inadequate amniotic fluid
2. Fetal paralysis

Symptoms/Characteristics:

1. Joints may be internally or externally rotation fixed
2. Walk in stiff legged motion
3. Often palms face outward
4. Trunk may be used to propel legs
5. Overall muscle weakness
6. Surgery can be performed, but may reverse
7. Afflicted people are usually bright and willing to learn
8. Associated conditions include: scoliosis, respiratory problems, growth retardation, facial and jaw deformities, and abnormal hernias

Teaching Considerations and Management:

1. Know range of motion R.O.M.
2. Extremely careful when mounting and dismounting – do not pull on joints
3. Focus on improving balance
4. Focus on strengthening muscles
5. Watch for hip and shoulder dislocation
6. Keep one side walker, even if they have advance beyond that point

Horse:

1. Normal to narrow if internally rotated
2. Fairly wide if externally rotated
3. Neck reins
4. No pullers

Equipment:

1. Adapted reins and stirrups
2. Fleece pad if affected in legs or if poor circulation
3. Devonshire boots if necessary/rubber bands

ARTHRITIS

Definition:

Inflammation in the joint or disturbance in the bone mass which can cause pain and damage to joints and surrounding structures.

Types:

1. Osteogenesis Imperfecta (Durante's Disease) - Hereditary "brittle bone disease" due to deficient deposits of bone salts

Symptoms/Characteristics:

- a. Abnormal fragility and plasticity of bone
- b. Frequent pathological fractures
- c. Decreased amounts of calcium
- d. Skin may be thin and bruise easily
- e. Can cause deformity in later years

**Children with severe cases should not ride because their bones may fracture with minimal stress

(Contraindicated)

2. Osteoarthritis (D.J.D. Degenerate Joint Disease, the most common type of arthritis)- A disease with an unknown cause. It is postulated to be caused by either.
 - a. Trauma or continued stress to joints
 - b. Genetic, metabolic, endocrine, biomechanical, hydrolytic
 - c. Secondary to chronic trauma or underlying joint disease

Symptoms/Characteristics:

- a. Affects weight bearing joints (i.e. hips, knees, spine)
- b. Usually affects elderly
- c. Causes limitations of use - mild to severe limitations of movement and R.O.M.
- d. Degenerative loss of articular cartilage (connecting to the joint)
- e. Bone spurs form
- f. Pain after exercise
- g. Not systemic
- h. Enlarged joints

3. Osteoporosis - characterized by a decrease in bone tissue that results in bone weakness. The causes are multifactorial and one possible cause is defective bone formation. Most often, hormonal changes increase the rate of bone re-absorption. If this condition is congenital, the patient may develop rickets.

Symptoms/Characteristics:

- a. Usually affects older people
- b. Increased possibility of fractures
- c. Decrease in bone mass
- d. Crush fractures of vertebrae are possible
- e. May have aching pains in bones or back

4. Rheumatoid- A severely crippling, systemic condition which involves inflammation and destruction of tendons, ligaments, and soft tissue of the joints. Its cause is unknown, but it is postulated that it is the result of an auto-immune disorder due to a reaction to a body's own carbohydrates or a combination of genetic factors and an auto-immune infection.

Symptoms/Characteristics:

- a. Chronic syndrome/non-specific, usually symmetric inflammation of peripheral joints
 - b. Joint tenderness and redness - very painful
 - c. Synovial thickening in most active joints
 - d. Stiffness upon rising - usually lasts longer than 30 minutes
 - e. Alternating remissions and flare-ups
 - f. Each flare-up is progressive
 - g. People may wear splints to protect joints
5. Juvenile Rheumatoid Arthritis (Still's Disease) - A multifactorial disease that is postulated to be caused by an auto-immune disorder

Symptoms/Characteristics

- a. Appears in children 2 to 5 years of age
 - b. 85% disappears after puberty
 - c. Joints are painful, swollen, and immobile or weak - the soft tissue of the joints
 - d. Blindness occasionally occurs resulting from conjunctive in the eyes
 - e. Interrupts growth patterns
 - f. May involve few or many joints
6. Ankylosing Spondylitis (Spinal Arthritis) - A disease that usually afflicts vertebral joints in males in their teens through their 30's whose severity varies for each case.
7. Osteopetrosis- A disease characterized by an increase in bone density, which causes an increase in the frequencies of deformity and fractures
8. Osteochondritis (Legg-Perthes Disease)- A condition affecting the thighbone in which a disruption of joint circulation (where bone and cartilage join) causes destruction of the joint.

Teaching Management

- a. Contraindicated during a flare-up
- b. Know joints that are involved - do NOT pull on joints that are affected
- c. Know R.O.M.
- d. Extreme temperatures are difficult
- e. The ride should be no longer than the rider can tolerate. Fatigue must be avoided.
- f. Rest periods may be needed side walker always with children with Rheumatoid and Brittle Bone Disease

- g. Mount last, dismount first
- h. Emphasize good posture - can stress of joints - and alignment in natural position if possible
- i. Exercises to relax rider are helpful
- j. A lot of walking

Horse

- a. Must be quiet, smooth and light sided
- b. Normal to narrow base
- c. Voice command
- d. Dressage wipes
- e. Impulsion at a walk
- f. Comfortable gaits

Equipment

- a. Fleece seat saver, sheepskin or bareback pad
- b. No stirrups if rider has knee inflammation
- c. A comfortable fit is very important if in a saddle
- d. Adapt equipment to help a crippled hand or arm (i.e., create ways to hold the reins, bicycle handles)
- e. Possible Devonshire boots/rubber bands if ankles and/or feet are affected
- f. Dressage whip or crop

CEREBRAL PALSY

Definition:

A number of non-progressive motor disorders resulting in the inability to fully control motor functions. This impairment of voluntary movement is a result of trauma to the immature brain (motor area of the brain). It can be accompanied by other brain disorders including seizures, M.R., L.D., vision and hearing impairment.

Causes:

1. Lack of oxygen to the brain or bleeding in the brain neonatally, during birth, or post-birth to 3 years
2. Brain damage
3. Neonatal asphyxia and neonatal jaundice

Symptoms/Characteristics: (can be mild or severe)

1. Ataxic (10% of cases):
 - a. Uncoordinated and irregular voluntary muscle action
 - b. Difficulty with rapid or fine movements
 - c. Decreased balance
 - d. Decreased muscle tone (hypotonic)
 - e. Unsteady, wide-based gait, clumsy, lack of balance
 - f. Shaky or rhythmical tremor-like movements
2. Athetoid (25% of cases):
 - a. Worm-like, irregular movements
 - b. Decreased coordination
 - c. Movements are unpredictable and fluctuate from high tone to low tone
 - d. R.O.M. may be increased or decreased, depending on high or low tone
 - e. Body and limbs tend to move at the same time
 - f. Legs can be high tone while the arms are low tone
 - g. Posture lacks stability
 - h. Difficulty with mid-line activities (brain)
 - i. Speech is affected
3. Spastic (70% of cases- most common):
 - a. Affected limbs often underdeveloped
 - b. Increased deep tendon reflexes
 - c. Increased tone (hypertonic)
 - d. Weakness
 - e. Scissoring gaits
 - f. Toe-walking
 - g. With sever spasticity, cannot regulate the amount of movement or tension the arms or legs produce
 - h. Coordination and stiffness make moving difficult

4. Hypotonic (extreme cases):
 - a. Very increased R.O.M.
 - b. Weak
 - c. Very decreased balance
 - d. Has difficulty moving against gravity
5. Rigid:
 - a. Extreme stiffness caused by excessive muscle tightness with little ability to move or bend
 - b. Tendon reflexes are not increased as in the spastic form of CP
 - i. CP rarely has a “pure” form with the majority of patients having mixed symptoms.
 - ii. In CP, the head and neck may be involved as well.

Teaching Management:

1. *Spastic and hypertonic:*
 - a. A warm-up necessary for relaxation
2. *Spastic*
 - a. Narrow base horse
 - b. Bilateral exercises, i.e., trunk twisting, toe rotation, arm swings to normalize tone or pulling thumbs out of palms exercises to decrease tone
 - c. Mount slowly first- do not force legs into position and reposition after warm-up if necessary. **Could weather makes warm-up phase take longer.**
3. *Ataxic:*
 - a. Wide base horse
 - b. Any type of balancing exercise is O.K.
 - c. Raise head, encourage rider to look up
 - d. Can mount towards the end
4. *Athetoid:*
 - a. Avoid balancing exercises because they are hard and may increase movement after warm up
 - b. Mount slowly
 - c. Allow motion of horse to provide relaxation
 - d. Wide base horse
 - e. Excitement will increase uncontrollable movement
5. *Hypotonic:*
 - a. Wide base horse
 - b. Work on weight bearing and stimulate weight shifts in proper alignment
 - c. Work on balance reactions and use irregular rhythm
 - d. Attempt to get them to place or hold limb against gravity to experience external sensory input (vibration, trotting) and look at the part moving
 - e. Uneven terrain

General Considerations:

1. Facilitate equilibrium reactions
2. Allow processing time
3. Avoid over fatigue
4. Be supportive - a great deal of effort may be required to do a simple task

5. Encourage the rider to look up (head position) which will facilitate the use of the arms
6. Do not be over protective
7. Do not lean on riders - riders will lean on support
8. Never jerk or force a limb
9. Remind the rider to swallow if drooling
10. Laughter and singing will increase breathing and therefore encourage relaxation
11. Have fun!!!!

Horse

1. Ataxic, Athetoid, or Hypotonic - wide base with perky gaits
2. Hypertonic or spastic - narrow base with flowing, rhythmical gaits

Equipment

1. Reins to halter or sidepull
2. Spastic - may need to begin with a bareback pad and surcingle; narrow saddle
3. Devonshire boots can be used
4. Rubber bands on feet often work
5. If the rider has anterior tilt (athetoid), raise front of the saddle to help align pelvis or use pommel pads

Components of Muscle Tone:

1. The postural response to gravity
2. Readiness of muscle to be active
3. Response to quick stretch
4. Tension present in resting muscle

Description of Body Parts Involved in Dysfunction:

1. Monoplegic: involves disability in one limb
2. Hemiplegic: one side of the body
3. Paraplegic: both legs
4. Diplegic: more involvement in the legs
5. Tetraplegic/Quadriplegic: all four limbs
6. Triplegic: three limbs usually leaving one good arm

Suffix: "plegia" means totally paralyzed

Suffix: "paresis" means part of the body is weak

Cerebrovascular Accident (C.V.A. STROKE)

Definition:

Damage to the brain due to the interruption of blood flow to the brain that usually affects one side of the brain, causing dysfunction to the opposite side of the body (hemiplegia). Strokes usually occur in older adults, but can also afflict infants and children. This is the third leading cause of death in the United States after heart attack and cancer. Incident rate is 500,000 per year. 10% attain almost full recovery; 25% recover with minor impairment; 40% suffer moderate to severe impairment; 10% are institutionalized; and 15% die following the stroke.

Causes:

1. Heart Disease
2. Diabetes
3. Hemorrhage
4. Thrombosis (blood clot)
5. Emboli from arteriosclerotic plaque (mild to severe damage)
6. Birth control pills
7. Drugs

Symptoms/Characteristics:

1. Very flaccid or spastic on involved side
2. Abnormal muscle tone
3. Asymmetry
4. Loss of proprioception (inability to receive stimuli originating in the muscles, tendons, and other internal tissue)
5. Decreased coordination
6. Decreased or absent sensation on involved side
7. Fluctuations of emotions
8. Paralysis
9. Right hemisphere stroke:
 - a. Impulsive
 - b. Poor judgment in decision making, as well as in judging distance, size, speed, position etc.
 - c. Paralysis of the left side of the body
 - d. Impaired ability to judge spatial relationships.
10. Left Hemisphere Stroke:
 - a. Slow, cautious behavior style
 - b. Paralysis of right side of body
 - c. Speech and Perceptual problems (also develops a slow and cautious style):
 - i. Apraxia - inability to perform a learned act (a motor planning problem, not physical)
 - ii. Receptive - cannot comprehend, but can write and talk
 - iii. Aphasia - motor control
11. Visual impairment

12. Affected cognitively, emotionally, and socially
13. Can show signs of improvement

Teaching Management:

1. The sooner they can ride, the better
2. Build confidence
3. Work on strengthening muscles
4. Work on increasing balance
5. May be necessary to mount on the off side
6. Exercise bilaterally to increase symmetry
7. May need to mobilize a flaccid limb to prevent joint damage
8. Careful of joint dislocation (shoulder and hip)
9. Give directions slowly; they have difficulty in learning and processing
10. Be consistent
11. Work on improving coordination
12. Increased independence
13. Be aware of frustration level

Horse:

1. Wide base horse with smooth gaits if low tone
2. Narrow horse if high tone
3. May need to neck rein
4. Predictable behavior

Equipment:

1. Sidepull or reins to halter
2. May need to shorten stirrup on the good side
3. Rubber bands
4. May need to modify reins to allow a Hemiplegic to guide with one arm (e.g.,rein handle)
5. Seat saver

CHARGE ASSOCIATION

(Coloboma, Heart, Atresia, Retardation, Genitals, and Ears)

Definition:

A rare disorder that manifests itself by affecting various areas.

Cause:

In some cases, the cause is autosomal recessive hereditary pattern

Symptoms/Characteristics:

1. *Coloboma* - absence of some eye tissue, including the iris or in the optic nerve.
2. *Heart Disease* - developmental abnormalities in the aorta
3. *Atresia* - absence of the normal opening between nasal cavity and the back of the throat
4. *Retardation* - retarded growth and development, as well as CNS abnormalities
5. *Genitals* - underdevelopment of the sex organs
6. *Ears* - abnormally short, wide ears, accompanied by some hearing impairment

This disorder is extremely rare and in 1994 there were only 200 cases. Women are twice as likely to be afflicted with CHARGE as men are.

COFFIN LOWRY SYNDROME

Definition:

A hereditary (dominant, sex-linked) disorder characterized by short stature, facial abnormalities, lax joints, low muscle tone, and retardation in physical and mental development

Symptoms/Characteristics:

1. Facial abnormalities characterized by square forehead with prominent sides, narrowing of temples, scarce hair on scalp, and wide-set eyes
2. Possible feeding and respiratory problems
3. Limb abnormalities including large, soft hands with double jointed, thick fingers that taper towards the tips, unusual prominent transverse crease, and shortened big toe
4. Mental retardation (more severe in males).
5. Clumsy, broad-based walk
6. Short stature
7. M.R. with low tone
8. Respiratory

CROHN'S DISEASE

Definition:

An inflammatory bowel disease characterized by severe chronic inflammation of the intestinal wall or any portion of the gastrointestinal tract, most often affecting the lower portion of the small intestine and rectum.

Cause:

Exact cause unknown; 10%-30% of cases may inherit the disorder but the inheritance pattern is unknown

Symptoms/Characteristics:

1. Inflammation of the lower portion of the small intestine and colon, occasionally inflammation of the middle portion; in some cases there is inflammation of the membranes that line the stomach, esophagus, and mouth
2. Nausea, vomiting, night sweats, loss of appetite, malaise, diarrhea, weight loss
3. Acute attacks cause fever, elevated white blood cell counts, and abdominal pain
4. Lesions in the intestinal wall and lymph nodes
5. Anemia
6. Joint pain and stiffness
7. **In children, symptoms are failure to thrive, fever, anemia, joint pain and stiffness
8. Contraindicated during an acute attack
9. Remission and flare-ups

People of Jewish descent are 3 to 6 times more likely to be affected

Equipment:

1. Seat saver

Horse:

1. Smooth and predictable

CYSTIC FIBROSIS

Definition:

Congenital obstruction of the pancreatic ducts by mucus resulting in emphysema of the lungs with chronic infection, pancreatic insufficiency, and pulmonary disorders

Cause:

Hereditary, recessive trait

Symptoms/Characteristics:

1. Shortened life span
2. Increased perspiration
3. May need to carry oxygen dispenser
4. Stomach complications
5. Tires easily
6. Blue tinge to lips, fingers and more
7. Abnormal growth with little to no weight gain

Teaching Management:

1. Exercise is good; increase amount gradually to suit the rider
2. Prevent over fatigue
3. Dust must be avoided
4. Cold or dampness may trigger an attack (exasperation)
5. Have plenty of water since they sweat more
6. Last to mount, first to dismount

Horse:

1. Quiet and smooth

Equipment:

1. May have to adapt to carrying portable oxygen supply
2. Water arena to prevent dust contamination

DWARFISM

(Vertically Challenged)

Definition:

A disproportionately short stature

Causes:

Interruption of growth and development

Characteristics:

1. Usually normal intelligence
2. Children may have balance involvement and speech delays due to middle ear infections
3. Anterior tilt pelvis
4. Lung and breathing patterns may be atypical with less volume due to small structure
5. Can be hydrocephalic with a shunt
6. Can have physical problem with loose joints and low muscle tone.

Teaching Management:

1. Symmetry of movement so all limbs are strengthened equally
2. Treat joint problems like someone with arthritis
3. With children, avoid stress on weight-bearing joints, i.e., no 2-point
4. Encourage good posture and joint R.O.M.
5. Work on improving balance

Equipment and Horse:

Make sure equipment and horse are suitable to the rider. For example, use long reins and a small saddle

***There are over 200 types of dwarfism, each due to a slightly different cause. The most common with an incidence of 1 in every 10,000 people in the U.S. is Achondroplasia.

EPILEPSY
(SEIZURE DISORDER)

Definition:

A C.N.S. disorder where a sudden disturbance in consciousness, sensory, and/or motor function occurs. The brain causes an abnormal electrical discharge that temporarily affects bodily systems. (Seizure disorders are secondary to a lot of other disorders.)

Causes:

1. Cerebral disorders, which will cause seizures, can be triggered by:
 - a. Fever
 - b. Hot weather
 - c. Boredom
 - d. Hunger
 - e. Stress
 - f. Menstruation
 - g. Fatigue
 - h. Lights
 - i. Excitement
2. C.N.S. infections
3. Toxic agents
4. Brain defects
5. Cerebral edema
6. Anaphylactic shock resulting from vaccinations, bee stings, allergies, ect.
7. Cerebral infarot (death of tissue resulting from the arrest of circulation to the artery supplying the part of hemorrhage)
8. Cerebral anoxia

Symptoms: (30-40 types)

Types of seizures:

1. Major (formerly called Grand Mal) or Tonic Clonic: a progression of seizures lasting 1 to 5 minutes
 - a. Major motor seizure
 - b. Total rigidity
 - c. Loss of consciousness
 - d. Breathing stopped or irregular
 - e. Tonic-clonic jerking (alternating contracting, relaxing of muscles)
 - f. Limpness
 - g. Consciousness
 - h. Incontinence
2. Petit Mal: lasts less than 30 seconds
 - a. "day dreaming"
 - b. Loss of consciousness
 - c. Head nodding

- d. Eye blinking
- e. These never begin after the age of 20
- 3. Akinetic: (drop attack)
 - a. Sudden and total loss of muscle tone and person falls down for between 10 seconds and 1 minute
- 4. Psychomotor or Complex Partial:
 - a. Loss of control often accompanied by chewing motions, followed by a period of mental confusion and amnesia
 - b. Will perform automatic acts which later will be unaware of
 - c. Do not usually lose consciousness

**In 80% of the cases, the symptoms can be decreased by medication

Signs (aura) that may appear when a seizure is coming on:

Headaches	Dizziness	Vomiting
Pain	Fainting	Nausea
Fever	Sweating	Loss of bladder control
Sounds	Lights	Sensation

Horses are especially sensitive to pre-seizures

Teaching Management:

1. For **major**, riding is **contraindicated**. However if an episode occurs:
 - a. Gently pull the rider off the horse
 - b. Lay the rider on the ground
 - c. Let the seizure run its course
 - d. Clear area to prevent head or body injury
 - e. Put rolled towel under head
 - f. Try not to touch the rider
 - g. Turn the rider's head sideways or turn the person on the side if they are vomiting or if the tongue is obstructed
 - h. Call 911 if the rider has multiple seizures, stops breathing, seizures for more than 8 minutes, requests an ambulance
2. Smaller seizures:
 - a. Dismount the rider if they are not alright after a few seconds
 - b. Keep lesson consistent
 - c. Avoid stress and sudden change
 - d. Avoid fatigue
 - e. Keep directions simple
 - f. Small seizures often go undiagnosed
 - g. *after small seizures, if the rider continues to ride, use thigh guard for a while; do not put demands on a rider who has had a seizure
3. General information
 - a. Know which medications the rider is taking
 - b. Assess the rider's present condition on an individual basis for each lesson
 - c. Always use a side walker

Horse:

A quiet, predictable, smooth-gaited horse that provides little frustration

FIBROMYALGIA

Definition:

A syndrome that is characterized by persistent, diffuse, aching pain that affects the muscles and connective tissue of the body. Over 80% of affected people are women between the ages of thirty and fifty.

Causes:

May be associated with a significant decrease in ovarian hormone concentrations, especially estrogen and or estradiol.

Symptoms/Characteristics:

1. General stiffness and soreness, often worse in the morning
2. Increased pain in the neck, trunk and hips
3. Restless, fragmented sleep that prevents normal rest and repair functions in tissue, leads to chronic fatigue and suppressed immune functions
4. Tenderness at musculotendinous connections
5. Numbness, burning or cold sensations in muscles and/or extremities
6. Diminished energy and/or marked fatigue
7. Unfit muscles lead to microtraumas in muscular and tendinous tissues
8. May be associated with mood changes: irritability, depression
9. May be associated with alterations in memory and concentration
10. Experience flare-ups of symptoms and remissions
11. Exercise may cause delayed pain 1-2 days later.\

Teaching Management

1. This type of exercise can be an effective treatment - increase gradually
2. Avoid over fatigue
3. Only do what rider can handle
4. May not want to ride during flare-ups - get feedback from rider
5. Increase balance
6. Increase muscle tone to retrain muscles
7. Last to mount, first to dismount
8. Stimulate the mind

Equipment

1. Seat saver (comfort is very important)
2. May have to adapt stirrups (high density stirrup pads) and reins if there is pain in the hands and feet
3. Longer stirrups if there is stress to the knees and hips

Horse:

1. Smooth gaits
2. Light sided
3. Voice trained

4. Whip trained
5. Non-puller

FRIEDREICH'S ATAXIA

Definition:

A progressive, hereditary neuromuscular syndrome that generally becomes apparent in childhood or adolescence. It involves slow deterioration of the spinal cord and brain. These changes affect speech and movement producing numbness or weakness of the arms and legs, curvature of the spine and lower limb paralysis. Although the disorder is progressive and treatment symptomatic, sudden remission of 5 to 10 years have been reported.

Causes:

A recessive genetic trait with classic phenotypic expression - 25% chance of having disease (aa), 50% will carry recessive allele (Aa) and 25% will not carry allele (AA)

Symptoms/Characteristics:

1. Congenital, but symptoms usually between the ages of 8 and 15
2. Normal intelligence levels
3. Walking becomes unsteady
4. All muscles can be affected
5. Decreased coordination
6. Decreased balance
7. Spinal curves may develop due to muscle weakness and imbalance
8. Vision and speech may be affected
9. Symptoms can vary from day to day
10. Pneumonia is a serious problem in later stages
11. Emotional strain

Teaching Management:

1. Do not over tire
2. May need rest periods during the lesson
3. Increase demands slowly
4. Last to mount, first to dismount
5. Work on posture
6. Encourage equal strength and bilateral, full R.O.M. of limbs
7. Watch for pressure sores with paralysis
8. Make the lessons stimulating to the rider's mind
9. Excessive heat, stress on exercise can temporarily increase symptoms

Horses/Equipment:

1. Wide base
2. Fairly light sided
3. Fleece pad/seat saver
4. Accepts whip
5. Voice trained

GRAVES DISEASE

(a.k.a. BASEDOW DISEASE, PARRY DISEASE, EXOPHTHALMIC GOITER DISEASE)

Definition:

A disease affecting the thyroid gland causing increased thyroid secretion (hyper-thyroidism), enlargement of the thyroid gland (goiter), and protrusion of the eyeballs; affects females more than males.

Causes:

Exact cause unknown, but thought to be an inherited autosomal recessive trait. It has also been traced to an autoimmune disorder.

Symptoms/Characteristics:

1. Eyes bulging from the head
2. Development of enlarged thyroid gland (goiter) and increased thyroid secretions. May result in swelling of the eyes and legs, extreme sensitivity to light, irregular heartbeat, clubbing of fingers, and development of breasts in males.
3. May not have heat tolerance
4. Emotional instability
5. Weight loss
6. Hyperactivity

Teaching Management:

1. Avoid fatigue
2. Avoid excessive heat
3. Consistent
4. Challenge mind

Horse:

1. Non-frustrating

GULLAIN BARRE SYNDROME

Definition:

A very rare rapidly progressive disease caused by a virus that affects the peripheral nerves causing inflammation of the nerves and paralysis.

Cause:

Postulated to be an auto-immune mechanism following viral infection. Damage to the covering of the nerve cells and axons.

Symptoms/Characteristics:

1. There is initially a respiratory infection followed by muscle weakness and then paralysis of muscles (flaccid)
2. Nerve fibers can regenerate and the person may recover all functions over a period of many months to a year. However, some people may not recover fully.
3. Loss of feeling in the extremities, then top trunk and face. Begins in the feet and progresses upwards
4. As nerves regenerate, there may be hypersensitivity or pain to touch
5. Intelligence is not affected
6. Absent or lessened tendon reflexes
7. Coordination problems
8. Balance problems
9. Affects teenagers, as well as adults

**Over 50% of the cases resume full and active lives, while only 5-15% will experience significant long-term disabilities.

Teaching Management:

1. Management will depend on the stage of the disease
2. If the rider has paralysis, then treat as a spinal cord injury
3. As nerves regenerate the individual may not be able to ride due to pain
4. Do not over fatigue
5. May need rest periods
6. Get rider involved in decision making
7. Ask how they are doing before they ride
8. Encourage good posture
9. Watch for pressure sores with any paralysis
10. Avoid excessive heat, stress, or exercise
11. Make lesson stimulate the rider's mind

Horses/Equipment:

1. Wide based
2. Light sided
3. Whip trained
4. Respond to rider's seat and weight
5. Voice trained
6. Devonshire boots or rubber bands
7. Bareback pad a possibility at first
8. Fleece pads may be needed

Hearing Impairment

Definition:

A partial or complete loss of the ability to hear.

Causes:

1. Congenital problems with anatomical structures of the ear
2. Nerve damage – sensorineural hearing loss or malformation – conductive hearing loss (2/3 of people with profound hearing loss have conductive hearing loss)
3. Injury
4. Infection
5. Tumor or cyst
6. Postnatal disease
7. Prenatal disease
8. Labor complications

Symptoms/Characteristics:

1. Age 0-7 sensory processing machine
2. Gravitational insecurity
3. Proprioception difficulties
4. If lost before age 3, sever language difficulties arise (pre-lingual deafness)
5. Impairment may be profound, partial, or intermittent
 - a. Deaf - ASL
 - b. Hearing impaired - HI
 - c. Hard of hearing - HOH
 - d. Late deafened
6. Frustration level very high
7. Noisy, overactive children
8. One of the hardest disabilities because it is not INSTANTLY recognized by others, therefore does not immediately arouse understanding
9. Universal paranoia

Teaching Management:

1. Forming communication VERY important
2. Use a demonstrator
3. Talk in a normal voice when signing
4. Emphasize development of other senses
5. Speak slowly and clearly – especially to children
6. Start with a leader and side walker – teach volunteers signals
7. Stress importance for the rider to keep attention on the instructor
8. Help develop rhythm
9. Lots of balancing exercises
10. Teach rider to feel the horse's movements
11. Bring rider into the middle of the arena to give instructions
12. Make sure they understand; too often, they smile and nod to avoid asking to repeat
13. Wear hearing aid if they have one
14. Turn your head toward the rider when speaking
15. Encourage rider to comply
16. Kinesthetic and visual learners

Horse:

1. Normal but not frustrating
2. Unflappable
3. Distinct gaits to help the rider learn “feel” (very rhythmic)
4. Energetic but calm

Equipment:

1. Flashlight

Disorders which may accompany hearing loss:

1. Achondroplasia (dwarfism)
2. Alport's Syndrome (Hereditary Nephritis with Nerve Deafness)
3. Alpert's Syndrome (Cranial facial malformation with syndactyly)
4. Batten Disease
5. Cerebral Palsy
6. Cleft Palate and/or Lip
7. Congenital Rubella
8. Congenital Syphilis
9. Crouzon's Syndrome (Craniofacial Dysostosis)
10. Cytomegalocirus
11. Down's Syndrome
12. Ectodermal Dysplasias
13. FG Syndrome
14. Golden-Har Syndrome (eye, oral, musculoskeletal anomalies)
15. Hunter or Hurler Syndrome (genetic)
16. Klippel-Feil Syndrome (craniofacial, neurologic)
17. Malformed Low Set Ears Syndrome
18. Maternal Herpes
19. Measles
20. Meningitis (viral, bacterial, or fungal)
21. Mumps (unilateral hearing loss)
22. Muscular Dystrophy
23. Neurofibromatosis
24. Osteogenesis Imperfecta
25. Pendred's Syndrome (metabolic)
26. Pierre-Robin Syndrome (craniofacial skeletal)
27. Pre-auricular Abnormalities (sinuses or skin tags)
28. RH Incompatibility (hyperbilirubinemia)
29. Toxoplasmosis (maternal infection - cat feces)
30. Treacher-Collins Syndrome
31. Trisomy 13-15
32. Trisomy 18
33. Turner's Syndrome (chromosomal defect)
34. Usher's Syndrome
35. Waardinburg's Syndrome (genetic)

HYPERSENSATION

Definition:

Increased awareness to stimuli which can occur in a number of disabilities.

Causes:

Occurs when nerves are healing and inflamed or dysfunctional as in traumatic injuries or nerve disorders

Symptoms/Characteristics:

Messages are sent to different brain areas and cause sensations, feel pin pricks, pain, burning, and/or tingling.

Teaching Management

1. Touch rider as little as possible
2. Expect over-reaction
3. The increased stimulation of the horse helps to desensitize
4. Do not force rider to touch things
5. Long sleeves and pants for protection

Horse

1. Low input
2. Comfortable saddle
3. Seat saver

***Secondary to a number of disabilities.

LEGG-CALVE-PERTHES SYNDROME

Definition:

A rare disease affecting hip joint - atrophy of the hip joint and shortening of the femur. Abnormalities in bone growth early in life may result in permanent deformity of the hip joint several years later. Symptoms appear without warning.

Causes:

A genetic disorder inherited through autosomal dominant gene.

Symptoms:

1. Onset between ages 6 and 12
2. Initially a mild aching in the hip followed by inability to move the leg normally
3. Pain in the hip eventually becomes more intense and muscle spasms can develop
4. Femur may become shorter than normal, causing a noticeable limp. This damage is caused by reduced blood supply to the joint part of the femur and the bone does not grow at a normal rate.

Therapy:

1. Anti-inflammatory drugs (similar to arthritis?)
2. Treat similarly to arthritis

Horse:

1. Narrow back

MULTIPLE SCLEROSIS (“MANY SCARS”)

Definition:

A disease characterized by demyelization of the nerve cells in the brain and spinal cord. This is caused by the development of sclerotic plaque patches on the brain and spinal cord and results in the disruption of neurotransmitters.

Cause (multifactoral):

1. Pathological immune/auto-immune response attacks the myelin
2. Viral infection may trigger demyelization
3. Genetic factors may influence susceptibility

Symptoms/Characteristics/Affects

1. Onset: affects adults between 20 and 40 years old.
2. Progressive
3. Exacerbation and remissions although some cases have no cycle and progression is either rapid or slow
4. High suicide rate due to depression
5. Weakness in trunk and extremities
6. Balance involvement
7. Fatigue occurs in 80% of patients and most commonly arises in the afternoon. Four types of fatigue:
 - a. Normali -results from rigorous physical activity. Managed by adjusting activity level and by resting
 - b. Short-circuiting -results when damaged nerves tire and their function is diminished. Managed by periodic resting as well as cooling the body
 - c. Lassitude -results in an overpowering feeling of exhaustion or sleepiness after little or not exertion. Managed by medication
 - d. Depression -managed by psychotherapy and/or medication
8. Decreased coordination
9. Bowel and bladder dysfunction
10. Numbness and tingling
11. Blurred or double vision
12. Speech impairment
13. Can be weak with too much muscle tone
14. Can have high or low tone
15. Inflammation of joints
16. Muscle atrophy
17. Lack of sensation
18. Loss of bowel and bladder control
19. Easily tired
20. Poor judgment
21. Chronic pain
22. Can't shift emotionally from one load to another

23. Some people plateau for years

*Most frequent chronic neurological disease in Western countries

*Most common cause of non-traumatic disability among young adults in the U.S.

*Occurs more commonly in latitudes 35-65 and most commonly in northern latitudes where a person spends the first 15 years of life

*3:2 ratio affecting women to men

*More common in Caucasians than those of African or Asian descent.

*20%-35% of patients experience relatively benign disorders with little or not disability.

*Mean survival time is 40 years which represents an increase of 10 to 15 years over the past decade

*250,00-350,00 affected people in the U.S., with 200 new cases being diagnosed each week

Teaching Management:

1. Focus on normalizing muscle tone
2. Encourage good posture
3. Balance
4. Avoid over fatigue
5. Last to mount, first to dismount
6. Be careful of hip muscles when mounting
7. Promote cheerfulness
8. Plan lesson around fun and cognitive challenges
9. Extreme heat/cold can cause difficulties
10. Increase demands gradually
11. May need rest periods
12. Get rider involved in decision making
13. Twenty minute post-ride rest
14. Utilize energy conservation techniques
15. Rider may be different each time they ride
16. Work mostly at the walk

Horse:

1. Light sided
2. Quiet
3. Narrow base if high tone, wide base if low tone
4. Non-frustrating
5. Whip trained
6. Voice trained

Equipment:

1. Fleece pad or bareback for pressure sores
2. Devonshire boots or rubber bands if necessary
3. Adjust stirrups for adequate support

MUSCULAR DYSTROPHY

(A group of muscle destroying disorders)

Definition:

An inherited disease with progressive degeneration of muscle fibers without evidence of neural degeneration

Cause:

1. Hereditary: different types may be passed either by autosomal dominant, autosomal recessive or X-linked recessive inheritance patterns
2. Genetic mutation

Symptoms/Characteristics/Affects: (there are 9 types)

1. Duchenne: most common type, primarily affects males. Most severe form. Females are carriers. Onset occurs from 2 to 7 years, affects 1 in 4,000 individuals
 - a. Rapid progression: first attribute is clumsiness, but after age 8 or 9 can't stand or walk alone
 - b. Life span usually less than 20 years
 - c. Proximal muscle weakness
 - d. Waddling gait, awkwardness
 - e. Toe waddling
 - f. Lordosis (sway back) will appear
 - g. Falls become frequent
 - h. Rising from the floor can be difficult
 - i. Muscle wasting is initially limited to shoulder and pelvic area
 - j. Infiltration of fat and connective tissue into the muscles may produce an enlargement of the calf muscles
 - k. Eventually all major muscles are affected – use of a wheelchair by age 7 to 9
 - l. Increased susceptibility to respiratory infections
2. Becker: possibly caused by deficiency of dystrophin protein. Less severe and slower progress of the disease than Duchenne type. Onset may occur from adolescence to adulthood; survival runs into middle to late adulthood; similar characteristics as Duchenne.
 - a. Slow progressive weakness of hips and shoulder muscles
 - b. Loss of deep tendon reflexes – affects ability to walk
 - c. Mild mental retardation
 - d. Joint contractures
3. Landouzy-Dejerine: transmitted as an autosomal dominant pattern; onset may occur from childhood to middle age; can have a normal life span
 - a. Relatively speaking – this is a benign form
 - b. Atrophy of facial, arm, and shoulder girdle muscles producing myopathic facial expression
4. Limb-Girdle: onset may occur from childhood to middle age; affects either sex.
 - a. Slowly progressive form
 - b. Increasing weakness in shoulder or pelvic girdle
 - c. Respiratory and heart function may also be affected and can lead to death by cardiopulmonary complications

Teaching Considerations:

1. 95% of patients develop scoliosis, encourage good posture
2. 1/3 exhibit M.R.; a lot have A.D.D. If intelligence is normal, then challenge the mind
3. Avoid fatigue
4. Muscles will never improve....so have fun!!!
5. Head and neck stability important
6. DO NOT do forward and backward bending exercises, rider's trunk control will become weakened
7. Extreme heat and cold will affect ability
8. Last to mount, first to dismount
9. Stirrup set a notch or two shorter for support
10. Work on balance
11. Lots of walking
12. Have rider spend time sitting sideways

Horse:

1. Normal to wide base for balance
2. Comfortable gait with smooth transitions
3. Possible neck rein

Equipment:

1. Fleece pad
2. Devonshire boots or rubber bands
3. Knots in the reins
4. Deep seated saddle with knee rolls
5. Bareback pads with soft rolls
6. Pillows and/or bolsters

CHARCOT-MARIE-TOOTH DISEASE (PERONEAL MUSCULAR ATROPHY)

Definition:

A hereditary neurological disorder affecting the peripheral nerves of 125,000 Americans (1995 data) characterized by weakness and atrophy, primarily in the legs, and disappearance of the fatty shields surrounding the nerves of the peripheral nerves. It is also sometimes referred to as “peroneal nerve disorder.”

Causes:

In most cases, inheritance is through autosomal dominant transmission, but can also be transmitted through recessive or x-linked transmission

Types:

1. Hypertrophic.Type1 - characterized by thickened nerve fibers and myelin abnormalities that slow down nerve signals. Commonly develops within the first 20 years of life and usually in adolescence
2. Neuronal/Type 2 - its characterized by the deterioration of nerve fibers without commensurate decreases in neural impulse transmission speed. Usually appears after age 20.

Symptoms/Characteristics:

1. Muscle atrophy and weakness in legs and small muscle of hand
2. “Foot drop” producing a slapping gait
3. Decrease in vibration, pain, and thermal sensation in the hand, foot, and lower part of the leg (Hyposensation)
4. Absence of stretch reflexes

Manage as M.D.

POLIOMYELITIS (POLIO)

Definition:

A disease that causes inflammation of the gray matter of the spinal cord that results in damage to the lungs and nerves of the CNS that control muscles.

Causes:

A virus resulting in three types of polio:

1. Abortive
2. Non-paralytic
3. Paralytic

Symptoms/Characteristics:

1. Mild to severe pain, weakness, or paralysis in any part of the body
2. Asymmetry
3. Decreased balance
4. Often more involved in the legs
5. Decreased R.O.M.
6. Damage is permanent
7. In post-polio, there is a faster rate of aging
8. Post-Poliomyelitis Syndrome (PPS) includes symptoms of increasing fatigue, decreasing balance, and decreasing flexibility

Teaching Management

1. Needs to decide whether or not to ride with or without braces
2. Work muscles with lots of active movements, i.e. posting trot and 2-point
3. Watch for limb weakness which may not be obvious, especially when mounting
4. Work with what is left
5. Adjust for PPS symptoms as they develop

Horse:

1. Normal and wide base
2. Input from gaits - perky
3. Light sided
4. Whip trained
5. Voice trained
6. May need to neck rein

Equipment:

1. Fleece pad
2. Devonshire boots or rubber bands
3. Bareback pad
4. Surcingle

5. Rein handle

SCOLIOSIS

Definition:

Curvature of the spine in “C” curve or “S” curve which causes postural asymmetry.

Characteristics

1. Functional - curvature disappears with certain positions
2. Structural - curvature present in all positions

** Check with medical doctor per degree of curvature and associated safety precautions

SPINA BIFIDA

Definition:

A birth defect characterized by a defective closure of the neural tube of the spinal column (i.e., one or more vertebrae, most commonly at waist level, do not develop properly and are open posteriorly)

Cause:

A congenital defect which occurs in the first 28 days of pregnancy. Some studies indicate a deficiency in folic acid contributes to the incidence. Occurs in 1 in 600 babies.

Symptoms/Characteristics

1. Varying degrees of disease depending on the presence or absence of a protruding sac that contains both the meninges and spinal cord
 - a. Occulta (hidden) - the mildest form of the defect in which there is incomplete closure of the vertebrae but not protrusion. It may go undetected but may be marked by observing a dimple or a tuft of hair on the back overlying the affected area.
 - b. Meningocele - the least common form. The sac contains tissues that cover the spinal cord (meninges) and cerebrospinal fluid. The nerves are not usually badly damaged and are able to function; therefore there is often little disability present.
 - c. Myelocele - the sac contains the spinal cord and there is damage to the cord.
 - d. Myelomeningocele - the most severe form in which the sac contains both the membrane and the spinal cord
2. Hydrocephalus - (C.S.F.) cerebral spinal fluid clogs the brain, which can cause brain damage. A shunt is usually inserted above the right ear to drain off excess fluid
3. Paralysis and/or weakness primarily of lower limbs
4. Affects trunk, legs, bowel and bladder
5. Decreased R.O.M.
6. Decreased sensation
7. Fractures
8. Decreased balance
9. Pressure sores
10. A secondary effect is decreased cognitive ability
11. Increased lordosis (sway-back)
12. High or low tone

13. Contractures (shortening of muscles)
14. Posture abnormalities
15. Early intervention a plus

Teaching Management:

1. Be aware of sac sites, no gait belts
2. Watch for pressure sores
3. Work on balance, posture, trunk control
4. Forward and backward bending should be prohibited
5. Watch for shunt dysfunction
6. If paralysis is present (with myelo-meningocele) do not allow the legs to dangle or hip dislocation will result. Keep the leg from the hip to the knee straight with flexion at the knee only
7. With myelo-meningocele patient is subject to osteoporosis and pathological fractures - always have a side walker
8. Mount and dismount anywhere
9. Careful of a possible catheter bag
10. Braces are generally removed if rider has long legs. If the rider has short legs, braces are usually kept on unless there are sensory problems or you want the rider to feel the bare back
11. Be careful of safety helmet fit

Horse;

1. Wide base to help with balance
2. If high tone, narrow base
3. May desire neckreiner
4. Smooth gaits
5. Voice trained
6. Whip trained

Equipment:

1. Full fleece pad
2. Rider should wear pants without seams to prevent irritation
3. Watch out for sac site
4. When fitting helmet - watch out for shunt location; make sure fit is not too tight or too loose

Signs of Shunt Dysfunction:

1. Onset could be rapid or slow
2. Behavioral changes of any type
3. Change in coordination
4. Blurred or double vision
5. Increased head circumference
6. "Sunset" eyes
7. Projectile vomiting
8. Difficulty awakening
9. Developing seizures
10. Stiff neck

11. Headache

SPINAL CORD INJURY

Definition:

A traumatic injury where the spinal cord is pulled, bruised, squeezed or cut. The number of people in the United States who are alive today and who have SCI has been estimated to be between 721 and 906 per million population. This corresponds to between 183,000 and 230,000 persons. Fifty -five percent of SCIs occur among persons in the 16 to 30 year age group, and the average age at injury is 32.1 years. Overall, 81.6% of all persons in the national database are male.

Causes:

1. Car, motorcycle accidents - most common cause (38 %)
2. Gun shot and knife wounds (acts of violence) - second most common cause (24%)
3. Falls (21.8%)
4. Sports or other accidents (7%)
5. Tumors

Symptoms/Characteristics:

1. Different levels of dysfunction depending on where injury occurs and degree of severity
 - a. C5, C6: head and neck usable within minimum shoulder use
 - b. C7: head, neck, full shoulders, some elbow twist
 - c. T1: some elbow and finger use
 - d. T1-T2: affects various parts of the trunk
 - e. L1: limited function in the upper leg
 - f. L3, L4: knee movement
 - g. L5-S1: ankle movement
 - h. Sacryl: bowel and bladder
2. Very flaccid or spastic leg
3. Impaired or absent sensation
4. Conducive to the development of pressure sores - skin breaks down more easily due to decreased circulation
5. Weakness in extremities and trunk
6. Fatigue
7. Fractures
8. Balance
9. Loss of bowel and bladder control
10. Bladder infections
11. Complete paralysis or weakness
12. There may be improvement with rehabilitation
13. Osteoporosis
14. Spinal instability
15. Lost or decreased breathing capacity
16. Autonomic dysreflexia - a potentially life-threatening increase in blood pressure, sweating, and other autonomic reflexes as a reaction to bowel impaction or some other stimulus

Teaching Management:

1. Do not accept riders with injury above T6 unless they can sit up
2. Good positioning is of utmost importance
3. Mounted and dismounted in the middle
4. Secure flaccid limbs
5. R.O.M. exercises with all limbs is important
6. Exercises should be designed to improve overall body tone, build endurance, increase self confidence
7. Do not perform any bending exercises without guidance of medical advisor to prevent further injury to the spine
8. Check skin after every ride for pressure sores
9. Pants without seams (e.g., sweat pants, seamless long johns) should be worn
10. Improve balance through halting, turnings, leg yields
11. Exercise toward normal alignment
12. Increase endurance
13. Muscle tone similar to spastic or ataxic
14. Avoid fatigue

Horse:

1. Wide base
2. Rhythmic mover
3. Smooth transitions
4. Light sided
5. Neck rein
6. Longitudinal mover
7. Voice trained

Equipment:

1. Western or Australian stock or dressage saddle
2. Surcingle with bareback pad
3. Fleece pad and/or seat saver
4. Adapted reins - ladder, knot, loop
5. Rubber bands

Tourette Syndrome

Definition:

A hereditary neurological movement disorder that is characterized by repetitive motor and vocal tics.

Causes:

1. Inherited as an autosomal dominant trait with incomplete penetrance. 50% chance of passing on to offspring
2. Possible biochemical imbalance of dopamine or serotonin neurotransmitters in the brain. Overabundance of dopamine production results in hyperactivity
3. Decreased serotonin concentrations inhibit the ability of the limbic system (which regulates emotional and behavioral responses) to communicate with the frontal lobes (which integrate sensory information for higher intellectual functions)
4. Some research indicated that Group A Hemolytic Streptococcus may provide an environmental trigger in genetically susceptible T.S. families.
5. Misfiring of neurons in the cingulate cortex of the inner forebrain.

Symptoms/Characteristics:

1. Involuntary movements of the extremities, shoulders, and face
2. Uncontrollable sounds and sometimes inappropriate words
3. Not progressive or degenerative
4. Symptoms are variable and follow a chronic waxing and waning
5. Begins in childhood with a twitch of a facial muscle
6. Other gestures: head shaking, shoulder jerking, arm flapping, foot stomping
7. Sounds emitted can be throat clearing, grunts, barks, screams, or sniffing
8. *Coprolalia* - repetition of obscene words occurs in 30% of all patients sometimes during a short period of their lives (several months)
9. *Echolalia* - repeating themselves
10. Obsessive-Compulsive and Attention Deficit Hyperactivity Disorder (ADHD) behaviors present in 50% of cases
11. In many cases, children will have mild symptoms that subside after adolescence
12. Begins in childhood between the ages of 2 and 16
13. Ratio of male to female is 3:1
14. Rare cases later onset as well as symptoms appearing as early as 1 year
15. Negative feedback from other kids (peers) can be detrimental

Teaching Management:

1. Positive and successful activity
2. Emotionally supportive
3. Teach to symptoms

Horses/Equipment:

1. Unflappable
2. Needs to accommodate tic

3. Sidepulls

TRAUMATIC BRAIN INJURY (T.B.I.)

Definition:

Trauma to the head from an external force causing rapid acceleration and deceleration of the brain within the confines of the skull resulting in injury to the brain. This is the number 1 cause of death to people under the age of 45; 78.8% of people with T.B.I. are men.

Causes:

1. Accident or trauma
2. Concussions
3. Cerebral contusion
4. Lacerations
5. Edema (swelling)
6. Surgery
7. Acts of Violence

Symptoms/Characteristics:

1. Characterized as Mild, Moderate, or Severe
25-30% will have a good outcome depending on the following factors:
 - a. Attention
 - b. Memory
 - c. Language
 - d. Visual and spatial abilities
 - e. Executive function - high cognitive functioning
 - f. Environment
 - g. Money
 - h. Adaptability and flexibility in the home environment
 - i. Personality and emotional change
2. Mental and/or personality changes and amnesia
3. Mild to moderate hemiparesis
4. Aphasia
5. Spasticity, ataxia, athetoses
6. Continued neurological deterioration
7. Physical symptoms may heal with time, but often cognitive problems persist
8. Responding to simple commands or directions may be difficult
9. Lacks judgement
10. Lacks social skills

Teaching Considerations:

1. Need structure and consistency
2. Respond to muscle tone problems
3. Need processing and response time
4. Be supportive - a great deal of effort and motivation may be needed to do a simple task

5. Have fun and encourage relaxation
6. Increase posture and balance
7. Be aware of carry-over rate, carry-over rate from one area to another is difficult
8. May have decreased sensation
9. Avoid fatigue
10. Need personal and emotional stability
11. Cannot teach real world skills without real world experience
12. Tasks tend to be boring and void of real world functionality
13. Activities tend to be adjusted to patient failure as success at one skill is achieved, then skill is changed so that client is at a failure level again

** A goal of rehabilitation is to upgrade the rating of T.B.I. from more to less severe.

Benefits of Therapy:

1. Sensory and motor functions - direct stimulation
 - a. Vestibular stimulation
 - b. Balance and coordination
 - c. Stimulates synergism
 - d. Conditioning and endurance
2. Facilitating adjustment to disability
 - a. Animals are very helpful since they bond with riders without being judgemental
 - b. Active recreational activity
 - c. Focus off-self, i.e. feeding and grooming
 - d. Sense of competency
3. Ecological validity
 - a. Conceptualizing needs
 - b. Relationship between horse and rider

Horse:

Treat in similar manner to C.P.

Equipment:

1. Fleece pad
2. Deep seat saddle
3. May need neck rein
4. Side pull

VISUAL IMPAIRMENT

Definition:

A partial or total loss of sight. 400,000 are legally blind, half of these people are under age 65.

Causes:

1. Congenital
2. Disease - in diabetes, insulin causes blood vessels in the eyes to break
3. Injury
4. Brain lesions

Symptoms/Characteristics:

1. **Legal blindness:** 20/20 vision or worse with corrective glasses. A legally blind person may see general hand movements and may be able to see light, but not know its source
2. **Moderate impairment:** Between 20/100 and 20/200
3. **Mild impairment:** Between 20/70 and 20/100
4. **Central vision:** Limited to what they can see in front of them due to “tunnel vision” and this affects depth perception and perception of arena space.
5. **Myopia:** “Near-sightedness” - can see near objects but not distant ones
6. **Hyperopia:** “Far-sightedness” - can see distant objects but not close ones
7. **Strabismus:** “Cross-eyed” - the eyes do not focus together to see a single object. It may appear to the person that there are two of everything (double vision), or objects dance or appear fuzzy. Some will use one eye for near vision and the other eye for far vision.
8. **Nystagmus:** Rapid, involuntary eye movements which make focusing difficult. People will tilt their heads to try to steady their vision
9. **Cortical blindness** - nothing wrong with the eyes but the visual part of the brain does not function. There is no meaning to what one sees
10. **Ptosis:** The eyelids droop but this does not affect vision
11. **Amblyopia:** “Lazy eye” - one eye may drift or has general difficulty in focusing
12. **Cataracts:** Film develops on the eye and causes blurriness to varying degrees
13. **Photophobia:** Sensitive to light and exposure can be painful
14. **Astigmatism:** The shape of the cornea is oval like a football instead of spherical like a basketball. Most astigmatic corneas have two curves - a steeper curve and a flatter curve. This causes light to focus on more than one point in the eye, resulting in blurred vision at distance or near
15. **Presbyopia:** “Short arm syndrome,” is a term used to describe an eye in which the natural lens has increasing difficulty focusing on objects up close (a normal process of aging)
16. Balance and proprioception problems

Teaching Management:

1. Someone needs to be the rider’s eyes at all times
2. Try to stay centered in the middle of the arena
3. Talk most of the time, keeping voice even, so the rider has an aural reference point
4. Describe the environment to give mental picture to the rider. Have the rider feel the horse and tack, and take them on a tour of the facility

5. Use Braille whenever possible
6. Communicate to the rider about what they can and cannot see
7. Work on building confidence
8. Encourage independence as confidence grows
9. Encourage the rider to “feel” the horse’s movement and learn to count strides
10. May need some sort of communication system - head set, beepers, “human letters” for dressage
11. Remember - blind riders will learn nothing from example. They must find out for themselves with verbal guidance and touch

Horse:

1. Normal to wide base
2. Distinctive feel/gait

Equipment:

1. Use brightly colored reins

**For riders who are deaf and blind:

1. Establish one-on-one communication
2. Possibly use signs on leg. For example, 3 pats means walk on, circle on the leg means turn
3. Lots of repetition required
4. Rider may not like tactile stimulation - find out before you hug them

Cognitive Disorders

ASPERGER'S SYNDROME

Definition:

It is the highest functioning end of the Autism Spectrum, thus a form of Autism. A person with autism thinks, feels, and experiences the world in ways that are incomprehensible to the rest of us. Those individuals with AS have an overdeveloped facility or skill. They are often referred to as the “little professor” or “geek” syndrome.

Causes:

The three Main Potential Causes:

1. Genetic factors
2. Unfavorable Obstetric events
3. Infections during pregnancy and early infancy which affect the brain
4. *Possible causes still under consideration are viral or bacterial, but NOT yet proven

Symptoms/Characteristics:

Social Behavior:

1. Inability to interact with peers
2. Lack of desire to interact with peers - “in their own world”
3. Lack of appreciation of social cues
4. Socially and emotionally inappropriate behavior/response
5. Limited/lack of body expression/gestures

Language/Speech Communication:

1. Delayed development
2. Superficially perfect expressive language
3. Formal pendantic language
4. Peculiar voice characteristics
5. Impairments in comprehension, includes misinterpretations of literal meanings

Interests/Routines:

Narrow interests:

1. Exclusion of other activities
2. Repetitive adherence
3. More rote than meaning

Repetitive routines:

1. Imposition being on self in aspects of life
2. Imposition being on others

Motor Clumsiness:

1. May or may not be affected

Non-Verbal Communication:

1. Limited use of gestures
2. Clumsy body language
3. Limited or inappropriate facial expression
4. Peculiar “stiff gaze”

5. Difficulty adjusting physical proximity

Sensory Sensitivity:

1. Auditory
2. Tactile
3. Taste and food texture
4. Visual sensitivity

Teaching Considerations:

1. Teach according to what the rider's needs are
2. Talk with parent about IEP's in the school setting
3. Consistency and structure are important (prepare the rider in advance for changes, if possible)
4. Take advantage of the rider's area of special interest
5. Give a lot of positive reinforcement
6. Try to minimize stress
7. Apply rules carefully (their needs and abilities to conform are different)
8. Respond well to use of visual aids
9. Use simple language, not abstract ideas
10. Try to avoid escalating power struggles
11. Keep the lesson fun
12. Try to keep the same volunteers and horse

Horse:

1. Calm
2. Promote success/independence
3. Non-frustrating, pulling horses.
4. Size depends on rider

Equipment:

1. Reins, which are soft, with adaptations, colored areas.
2. Comfortable saddle
3. Seat saver

AUTISM

Definition:

Autism is a complex developmental disability that typically appears during the first three years of life and affects a person's ability to communicate and interact with others. Autism is defined by a certain set of behaviors and is a "spectrum disorder" that affects individuals differently and to varying degrees. The Centers for Disease Control and Prevention ADDM autism prevalence report concluded that the prevalence of autism had risen to 1 in every 110 births in the United States and almost 1 in 70 boys.

Causes:

1. Metabolic defects
2. Brain damage due to prematurity; birth trauma; CNS infection
3. Structural abnormalities in the brain, particularly the cerebellum and the brain's growth pattern, that may be genetically linked
4. Fetal alcohol syndrome (FAS)
5. Early childhood vx (not proven)

Symptoms/Characteristics:

1. Self pre-occupation - may not relate to people, avoids eye contact, has delayed or not social smile. Profound withdrawal from people including mother figure. Frequently described as "being in their own world"
2. Usually begins at birth; invariably present by age 3
3. Communication dysfunction - delayed language development and inappropriate word usage. May repeat what you say. Has difficulty in expressing wishes.
4. Usually normal physical development.
5. May appear blind or deaf although they can hear and see
6. Walks on tip toes
7. Gets "stuck" in an action - repetitive or sustains odd play such as spinning an object
8. Self-abusive behavior such as head banging, biting
9. May be very smart in specific skills and generally has an excellent memory. Autism may be very mild to severe with functional retardation
10. Function can vary from hour to hour or day to day
11. Can exist in combination with other problems caused by organic brain disorders
12. Tactile defensive
13. Fear factor
14. Lack of judgment
15. Resistant to normal teaching methods
16. Apparent insensitivity to pain
17. Uneven development of gross and fine motor skills
18. Sensitive to sounds
19. Aggressive/abusive
20. Insistent on routines

Teaching Management:

1. Teach according to degree of involvement
2. Approach individual slowly without demands
3. Begin with easy tasks that make them feel happy; add new tasks very slowly
4. Give loads of praise for accomplishments; encourage confidence
5. Decrease stress - they are already stressed due to lack of communication skills
6. Do not allow inappropriate behavior and discipline as you would any child
7. Do not force interaction. Even though they may not respond, this does not mean they do not understand.
8. Try to maintain eye contact
9. Teach by repetition and bodily guidance
10. Helps to have the same horse and volunteers so the rider can establish a bond
11. Insist that the riding helmet be worn
12. Increase interpersonal relationships and social interaction
13. Keep lessons lively and use lots of games
14. Lessons need to be very structured

Horse:

1. Calm
2. Promote success
3. May be large horse
4. Non-puller

Equipment:

1. Pre-riding desensitization
2. Seat saver
3. Soften reins with adaptations

BATTEN DISEASE

Definition:

A recessive, inherited, degenerative, neurological disease, which may affect a person of any age, but primarily strikes infants, toddlers, and school-age children. 3 in every 100,000 children are affected

Cause:

A recessive genetic disorder linked to a buildup of substances called lipopigments in the body's tissues, in this case primarily tissues in the brain

Symptoms:

1. Decrease in cognitive function
2. Personality and behavior changes
3. Loss of communication and motor skills
4. Ataxia or clumsiness
5. Spasticity
6. Seizures – progressively increasing in number and severity.
7. Progressive loss of sight
8. Poor circulation
9. Decrease in muscle mass
10. Hyperventilation
11. Hallucinations and dementia in children and schizophrenia in the adult form
12. Decreased life span

Teaching Methods/ Considerations:

1. Clear and simple directions
2. Keep things fun
3. Work with what physical and cognitive abilities are still in tact
4. Be flexible and realize there will be digression of abilities
5. Also, see methods for working with visually impaired riders

Equipment:

1. Possibly use adaptive reins.
2. Seat saver for comfort

Horses:

1. Wide-based horse
2. A calm, dead sided horse

CHROMOSOME 14 - TRISOMY MOSAIC

Definition:

A very rare chromosomal disorder in which an extra chromosome 14 is present in some of the cells.

Cause:

Extra chromosome 14 in some cells.

Symptoms/Characteristics:

Severity of symptoms depend on percentage of cells with an extra chromosome 14.

1. Delayed growth of fetus during pregnancy and/or after birth
2. Developmental delay and mental retardation
3. Congenital heart disease
4. Physical characteristics: prominent forehead, unusually wide set eyes, unusually small jaw, short neck palate, unusual pattern of skin coloration, abnormally small eyes

**Very rare disorder - only approximately 15 cases documented in medical literature

CHROMOSOME 22 - TRISOMY MOSAIC

Definition:

A rare chromosomal disorder in which an extra chromosome 22 is present in some cells

Cause:

An extra chromosome 22 in some cells

Symptoms/Characteristics:

Severity of symptoms depend on percentage of cells with an extra chromosome 22

1. Unequal development of the two sides of the body, accompanied by one-sided hearing loss
2. Incompletely developed fingers and toes, abnormal or missing nails, creases on the palms of the hands
3. Areas of unusual skin coloration
4. Intelligence may be mildly impaired
5. Malformation of major blood vessels that enter the heart
6. Abnormalities of the kidneys
7. Malformation of the elbow

TRISOMY 13 (PATAU SYNDROME)

Definition:

A rare chromosomal disorder characterized by the presence of extra chromosome 13, causing major development defects along the center of the brain and face, and mental retardation.

Cause:

Extra chromosome 13 in cell.

Symptoms/Characteristics:

1. Newborns are usually small and have multiple birth defects, including microcephaly and failure to close the fontanelle (which results in a soft spot on top of the head)
 2. *Myelomeningocele*: See SPINA BIFIDA
 3. Most infants are deaf and have profound mental retardation
 4. Skeletal and muscle abnormalities including unusual number of fingers and toes, underdevelopment of the lower portions of arms, legs, and absence of muscle in these areas
 5. Congenital heart defects
- More cases of preeclampsia in women carrying a fetus with trisomy 14 syndrome than would be expected
 - 50% of infants have life-threatening complications within the first month

TRISOMY 18 SYNDROME

Definition:

A rare chromosomal disorder characterized by the presence of an extra chromosome 18, producing unusual physical characteristics and other abnormalities developing during fetal growth

Cause:

Extra chromosome 18 present in cells

Symptoms/Characteristics:

1. Infants experience failure to thrive and are usually thin due to poor sucking ability
 2. Weak fetal activity and excessive amniotic fluid
 3. Premature birth
 4. Skeletal muscle and layer of fat under the skin are underdeveloped, giving a wrinkled appearance to the skin
 5. Muscle may be particularly rigid
 6. Mental retardation and motor delays
 7. Abnormalities of hands and feet – underdeveloped nails, clenched fingers, unusually small thumb
 8. Congenital heart disease
 9. Respiratory problems
 10. Kidney impairments
- This disorder occurs four times more frequently in women than in men
 - Incidence increases with maternal age.

DOWN'S SYNDROME

Definition:

A congenital birth defect with a chromosomal abnormality. In 94% of the cases, there is an extra copy of chromosome 21 (Trisomy 21). 3.6% of abnormalities are caused by translocation of the chromosome and 2.4% are due to mosaic abnormalities. (Associated with M.R.)

Causes:

While disorder is caused by problems with chromosome 21, the reason for these problems is unknown.

Symptoms/Characteristics:

1. Intelligence level ranges from low normal to severely retarded
2. Low muscle tone
3. Small, flattened cranium
4. Short, flat nose
5. Epicanthal fold
6. Short stature
7. Short phalanges and wide gap between first and second toes
8. Large, fissured tongue
9. Loose joints
10. Limbs out of proportion to trunk
11. Decreased balance
12. Decreased ability to feel or control movements
13. Secondary problems include heart conditions, ear infections, breathing, hearing, speech and vision problems
14. Fear factor
15. Can be manipulative and/or stubborn
16. Tend to act younger than actual age
17. Pleasant and affectionate
18. Try to please
19. Unable to handle abrupt changes very well
20. Vision can be affected

Teaching Management:

1. Hypnotic
2. Encourage good posture
3. Let them get used to the horse and increase riding time slowly
4. Give them emotional support with volunteers in the beginning
5. Being challenging them as they progress. They can become quite good at riding, vaulting, and competing
6. Be cautious about over-challenging them and remember the fear factor and level of frustration
7. Be gentle with constructive criticism
8. Be careful of dust and sun
9. People with instability must not ride

Horse/Equipment:

1. Broad-based and baby-sitter
2. Lindel/sidepull
3. Saddle hard to fit and rein length

DEVELOPMENTAL DELAY

Definition:

A catch-all term to include many functional disabilities. It is used as a temporary term for a child's condition until they can be more accurately diagnosed. In infants, premature birth, major surgeries, and eating disorders can cause actual developmental delay - the child may fully recover. Other problems associated with developmental delay include major growth delays of gross motor, fine motor, language, and social skills; autism, CP., M.R., and seizure disorders.

FETAL ALCOHOL SYNDROME / FETAL ALCOHOL EFFECT
“Drug Babies”

Definition:

Children who are damaged in-utero from drug and/or alcohol abuse by their mothers. In FAE, there are no physical characteristics but cognitive deficits appear within the first 2 months of life.

Symptoms/Characteristics:

1. Can have a wide variety of problems including:
 - a. M.R.
 - b. C.P.
 - c. ADD/ADHD
 - d. Developmental Delay (D.D.)
 - e. L.D.
2. Become irritable or frustrated for unknown reasons
3. Have sudden screaming tantrums due to pain or other sensations
4. Get “stuck” in an action or unable to resolve a simple problem such as how to reach for something
5. Daydream and unable to focus on a task
6. Fidget, be hyperactive or have tremors
7. Behavioral problems
8. ADD (with or without hyperactivity) often showing no response or aberrant response to drug therapy
9. Brain damage from mild to quite severe. Some, but not, all children are retarded
10. Impulsiveness
11. Problems with reasoning and judgment
12. Learning delays
13. Speech and language delays
14. Deficiency in social perception
15. Inflexibility
16. Problems increase as they fatigue
17. Hyper- or Hyposensation

Physical Characteristics of People with FAS:

1. Low birth weight and/or small size as young children
 2. A characteristic pattern of facial features including short openings for the eyes, smooth area between the nose and lips, then upper lip and flat mid-face
 3. Small head size
 4. Misaligned teeth
- Leading cause of M.R. in the Western world:
 - FAS = 1/600 to 750 (leading non-hereditary cause of M.R.)
 - FAE = 1/300 to 375
 - Down’s Syndrome = 1/750 to 800

Fragile X = 1/700 to 1000
Spina Bifida = 1/600 to 1000

Teaching Management:

1. Times of quiet should follow times of stimulation
2. Choose your battles very carefully
3. Teach to symptoms
4. Keep attention
5. Clear step by step instructions
6. Persistency through repetition

Horses:

1. Active mover
2. Not oversensitive (dead sided)

Equipment:

1. Sidepull
2. Adaptations needed will vary depending on degree of symptoms

FG Syndrome

Definition:

An uncommon hereditary disorder that affects males.

Causes:

This syndrome is presumed to be due to mutations on the x-chromosome.

Symptoms:

1. M.R.
2. Absence of an anal opening or abnormal placement of anus
3. Genital abnormalities
4. Constipation
5. Diminished muscle tone
6. A shortened stature with a disproportionately large head and a combination of facial abnormalities
7. Frequent middle ear infections
8. Delayed acquisition of speech, motor skills, and sensory integration
9. Deafness
10. ADHD/ADD
11. Seizures
12. Migraines
13. Depression
14. Anxiety
15. Congenital heart failure

Teaching Methods:

1. Keep the rider's attention
2. Decrease distractions
3. Promote independence
4. Give simple, clear, and concise directions
5. Also, see methods for Asperger's Syndrome and M.R.

Equipment:

1. Comfortable saddle, seat saver
2. Helmet needs to fit correctly

Horses:

1. Calm
2. Non-frustrating, non-pulling
3. Wider-based horse

FRAGILE X SYNDROME

Definition:

Defect of the X chromosome that causes mild mental retardation.

Cause:

A breakdown of certain areas on the X chromosome.

Symptoms:

1. Connective tissue abnormalities (e.g., hyperextensibility)
 2. Heart problems (including mitral valve prolapsed)
 3. Flat feet, large ears, long narrow face, high arched palate, dental problems
 4. Low muscle tone
 5. Autistic symptoms
 6. Delayed motor development
 7. Speech and language problems, ranging from poor language content to automatic repetition of words/phrases (echolalia); poor sensory skills
- Tends to affect babies born to older women
 - More common and more severe in males
 - Repeating Syndrome: form of Fragile X Syndrome, but defect occurs at a different site on the X chromosome

Teaching Management:

1. Teach the same as M.R. and autism

Horse:

1. Wide-based

GERSTMANN SYNDROME

Definition:

A rare neurological disorder resulting from brain injury or developmental disorder. It occurs in children and adults who have experienced brain damage to the focal and sensory centers in the left hemisphere of the brain.

Causes:

1. Damage to the left hemisphere of the brain controlling focal and sensory functions
2. Scar tissue (which can be surgically removed to alleviate symptoms).
3. Trauma
4. Brain tumor
5. Unknown causes in some cases

Symptoms/Characteristics:

1. Loss of 4 neurological functions:
 - a. Ability to express thoughts in writing
 - b. Ability to do mathematics
 - c. Ability to indicate with your own or another person's finger
 - d. Inability to make the distinction between the left and the right side
- Affects males and females of any age in equal numbers
- One or several identifying symptoms may occur as a result of head injury, stroke, brain, disease, tumor, or LD

MENTAL RETARDATION

Definition:

An intellectual disorder due to brain damage, underdevelopment of the brain, or genetic disorders.

Causes:

1. Most common (90%) is environmental damage - Alcohol exposure
2. Phenylketonuria (P.K.U.) genetic condition transmitted as autosomal recessive trait. It involves an error in metabolism of phenylalanine (an amino acid) to tyrosine (another amino acid). Allows for the accumulation of phenylalanine in body fluid
3. Rh (Rhesus) blood factor - blood antigens
4. Down's syndrome
5. Maternal illness or poor nutrition
6. Premature birth
7. Prolonged labor
8. Disease
9. Brain injury - Hydrocephaly, Microcephaly, Acrocephaly (cone, peaked, malformed) Anencephaly (absence of brain or spinal cord with cranium being open)
10. Glandular disorder
11. Environmental deprivation
12. Emotional problems
13. Toxicity
14. FAS/FAE
15. Fragile X Syndrome
16. Epilepsy

Symptoms/Characteristics:

1. I.Q. lower than 70
2. Unpredictable
3. Language difficulty
4. Short attention span
5. Often hypotonic
6. Decreased coordination
7. Decreased balance
8. Does not comprehend abstract concepts
9. Fear factor
10. May employ negative attention-getting techniques
11. Takes a long time for motor planning
12. May have inappropriate social skills
13. Toxicity
14. Lacks ability to generalize
15. Unable to learn incidentally

(See next page for chart of Developmental Characteristics by degree if M.R. and age)

Teaching Management:

1. Work at rider's competency level, not below it
2. Increase balance and body awareness
3. Break directions into simple steps - task analysis
4. Don't frustrate
5. Demonstrate / show and tell
6. Use repetition and consistency
7. Allow for processing
8. Activities should be fun
9. Set goals so riders know when they succeed
10. Encourage independence
11. Develop trust
12. Lots of verbal prompts
13. Modeling
14. LOTS of rewards

Horse:

1. Confidence builder
2. Babysitter
3. Wide base if low tone

Equipment:

1. sidepull

LEARNING DISORDERS

Between 15 - 20 % of school children have learning disabilities. They have average or above average intelligence, but have perceptual, conceptual, or coordination disorders resulting in significant difficulties in speaking, reading, writing, spelling, listening, calculating math, or relating socially. They do poorly in school compared to their ability and/or lack the social perception skills needed for acceptance by peers and the community.

Symptoms/Characteristics:

1. Lack of self-esteem
2. Stress
3. Fear of success, will deliberately not succeed
4. Depression
5. Chronic anxiety
6. Family problems and tensions
7. Poor coordination and clumsiness
8. Distractibility with short attention span
9. Difficulty with auditory/visual discrimination
10. Inactive or extremely overactive
11. Speech and/or language problems
12. Directional confusion
13. Difficulty with expression of thought
14. Symbol confusion
15. Poor eye-hand coordination
16. Preservation
17. Difficulty understanding or following directions

PRADER-WILLI SYNDROME

Definition:

A rare genetic, complex multi-system disorder diagnosed more often in males born after a prolonged gestation period, often in the breech position.

Causes:

Genetic disorder always from the father. Dominant gene 50% rate of transmitting to offspring. Additionally, an environmentally caused chromosome damage has been proposed, the prolonged exposure of the father to hydrocarbons

Symptoms/Characteristics:

1. Muscular weakness as an infant
2. Failure to thrive due to poor sucking ability due to muscle weakness
3. Decrease of efficiency of the genitalia
4. Short stature
5. M.R.
6. Hyperphagia (eating excessively) therefore severe obesity to a degree where it becomes life-threatening. The need to eat usually develops between 1 and 3 years old. The compulsion is so strong that if left unsupervised, they may eat inedible objects
7. Low birth weight
8. Decreased fetal movement
9. Sleepiness
10. Weak cry
11. Unusually small hands and feet (acromicrial)
12. Narrow forehead
13. Strabismus (cross-eyed)
14. Almond-shaped eyes
15. Developmental delays relating to head control and the ability to crawl
16. Sexual development is premature but stops after puberty
17. Patients tend to have fair coloring
18. Temper tantrums

Teaching Management:

1. Improve muscle size and tone
2. Help develop walking pattern
3. Exercise will help with weight control
4. Teach to mental capabilities

Horse/Equipment:

1. Weight carrier