Cerebellar Deviation & Ataxia
**Definition:**

- Ataxia – Is an impairment of co-ordination in the absence of muscle weakness

- Cerebellar Ataxia – neurodegenerative disorder characterised by progressive degeneration of the cerebellum leading to various neurological and systemic symptoms
Pathophysiology

• Damage or dysfunction of the cerebellum
  ▪ Input pathways
  ▪ Output pathways
  ▪ Cerebellum

• The different area’s of the cerebellum present differently:
  ▪ Midline Area’s – posture, locomotion & oculomotor (bilateral)
  ▪ Intermediate area’s – tremor, dysarthria & impaired limb function
  ▪ Lateral hemispheres – poor visuomotor co-ordination (ipsilateral)
Causes & Risk Factors:

- **Acute:**
  - Vascular disorders
  - Intoxication
  - Migraine

- **Sub-acute:**
  - Infections
  - Multiple Sclerosis
  - Tumours

- **Chronic**
  - Alcohol
  - Genetic Disorder (autosomal dominant spinocerebellar ataxia, recessive inherited & X-linked ataxia)
  - Friedreich’s Ataxia
  - Neurodegeneration
Signs & Symptoms:

- Dysmetria
- Dysdiadochokinesis
- Impaired Co-ordination (Dyssynergia)
- Tremor (Kinetic, intention or postural)
- Unsteady, wide-base gait
- Slurred, Dysarthric speech
- Abnormal eye movements (Nystagmus)
- Muscle hypotonia (Acute Lesions)
Medical Management:

- Dependant on the cause
- Reversible:
  - Medication for infections & vascular conditions
  - Surgery for tumours
  - Intoxication & migraine reverses without specific management
- Irreversible:
  - Can limit or reduce but not cure
  - Pharmacology treatment for movement disorders (e.g.: tremors, nystagmus)
    - Acetazolamide
    - L-carnitine
    - Coenzyme Q10
    - Vitamin E
Physiotherapy Problems:

- Decreased balance & Stability
- Decreased coordination & Motor Planning
- Decreased postural control
- Poor gait pattern
- Decreased functional independence
- Hypotonia & Muscle weakness (Acute)
Physiotherapy Management:

• Balance and stability exercises
  ✓ Cognitive strategies
  ✓ Visual Stimulation
• Increase co-ordination
  ✓ Sensory & cognitive strategies
  ✓ Breaking down complex movements
  ✓ Frenkel’s Exercises
• Increase postural control
  ✓ Stability to prevent rigidity
• Re-educate functional gait
• Improve independence
• Normalise tone
• Muscle strengthening
Evidence Based Article:

References:

• Images courtesy of GOOGLE images. 2012.
• http://www.bettermedicine.com/article/cerebellar-ataxia-syndrome/treatments