

BRAIN INJURY

Fundamental Items Checklist (PHASE A)

- ☐ Incidence of BI, most common causes in young vs elderly
- ☐ Cranial nerves: function and location
- ☐ Primary motor cortex, premotor cortex, somatosensory cortex, auditory cortex, primary visual cortex
- ☐ Visual deficits following brain injury, including visual field cut, hemianopsia, visual discrimination, visual form constancy, visual figure ground, visual closure, visual-spatial relations, visual memory, visual sequential memory
- ☐ Upper motor neuron vs lower motor neuron
- ☐ Normal Pressure Hydrocephalus
- ☐ Ventriculoperitoneal Shunt vs Ventriculo-Atrial Shunt and signs of displacement and/or blockage
- ☐ Diffuse axonal injury vs focal injury
- ☐ Types of intracranial hemorrhage: epidural hematoma, subdural hematoma, subarachnoid hemorrhage, intraventricular hemorrhage
- ☐ Brainstem herniation
- ☐ Anoxic vs traumatic BI and differences in clinical presentation and prognosis
- ☐ Nerve anatomy & physiology (e.g. axon, dendrite, etc)
- ☐ Ascending reticular activating system and consciousness
- ☐ Causes and presentation of altered tone after brain injury
- ☐ Principles that drive neuroplasticity and motor learning (rehab factors)
- ☐ Mild vs moderate vs severe TBI, persistent symptoms following a concussion
- ☐ Risk factors for heterotopic ossification, medical management, therapy indications and contraindications (also in SCI section)
- ☐ Decerebrate, decorticate posturing
- ☐ Mechanical ventilation
- ☐ Traumatic parkinsonism
- ☐ Types of post-traumatic seizures and their impact on the nervous system
- ☐ "Doll eye" phenomena
- ☐ Post-traumatic amnesia
- ☐ Virchow's triad (risk factors for thromboembolism following trauma)

Articles from the ANPT Resource List (PHASE B)

- ☐ Clinical Practice Guidelines to improve locomotor function following chronic stroke, incomplete spinal cord injury, and brain injury, Hornby et al, *J Neurol Phys Ther*, 2020
- ☐ Exercise is Medicine for Concussion, Leddy et al, *Curr Sports Med Rep*, 2018
- ☐ Physical Therapy Evaluation and Treatment After Concussion/Mild Traumatic Brain Injury, Quatman-Yates CC et al, *J Orthop Sports Phys Ther*, 2020
- ☐ Results from a Randomized Controlled Trial to Address Balance Deficits After Traumatic Brain Injury, Tefertiller et al, *Arch Phys Med Rehabil*, 2019

- ☐ A systematic review of the effect of physical exercise on cognition in stroke and traumatic brain injury patients, Vanderbeken et al, *NeuroRehabilitation*, 2017
- ☐ Physical therapy in Down syndrome: systematic review and meta-analysis, Ruiz-Gonzalez et al, *J Intellect Disabil Res*, 2019
- ☐ A schedule of gross motor development for children with Down syndrome, Winders et al, *J Intellect Disabil Res*, 2018
- ☐ Do physical interventions improve outcomes following concussion: A systematic review and meta-analysis, Reid, Farbenblum & McLeod. *Br J Sports Med* 2022
- ☐ Experienced Clinical Decision-Making in PT Management of Concussion: A Qualitative Study Galgon et al. *PTJ*, 2024

Clinical Items Checklist (PHASE C)

- ☐ Recommended Outcome Measures specific to setting and ICF level specific to Brain Injury (if applicable)
- ☐ Motor Learning assessment & treatment
- ☐ Stages of Coma Recovery and clinical presentation during each stage
- ☐ Ranchos Los Amigos Scale of Cognitive Functioning-Revised
- ☐ How interaction with the patient varies in each stage of coma recovery
- ☐ Glasgow Coma Scale and how to identify which stage the patient is in
- ☐ Disorders of consciousness: coma, vs vegetative state vs minimally conscious state
- ☐ Prognostic factors during hospital stay
- ☐ Behavioral disorders after brain injury and behavior management
- ☐ Recommended Outcome Measures specific to TBI, their ICF level, normative values and fall risk cutoffs, if any (from Edge Task Force)
- ☐ Clinical / bedside tests for cranial nerves
- ☐ Interventions for visual disorders (e.g. prisms, patching, visual therapy)
- ☐ Return to play protocol and exertion testing
- ☐ Red flags in the acute phase of a concussion
- ☐ Sharp Purser test
- ☐ Neurometabolic Cascade of Concussion: The cellular-level event following mild TBI (ionic shifts, potassium efflux, calcium influx, glutamate excitotoxicity, and the subsequent energy crisis/decreased cerebral blood flow).
- ☐ Blast-Induced Brain Injury Mechanics: Primary (pressure wave), secondary (shrapnel), tertiary (physical throw), and quaternary (burns/toxins) injury mechanisms.
- ☐ BPPV following head injury
- ☐ Persistent symptoms after a concussion: causes, indicators of prolonged recovery, incidence
- ☐ Risk factors for joint contractures
- ☐ Spasticity management and contractures
- ☐ Serial casting indications, contraindications, and expectations
- ☐ Low load long duration (LLLD) stretching and devices (e.g. Dynasplint)

- ☐ Role of multidisciplinary team members including neuropsychology, social work, Occupational Therapy, psychotherapy, Speech-Language Pathology
- ☐ Prognostic indicators in acquired brain injury
- ☐ Medications for spasticity management: Baclofen (oral or intrathecal), Dantrolene Sodium, Tizanidine, Botulinum toxin
- ☐ Pain following head trauma: neuropathic pain, central pain syndrome, post-traumatic headache
- ☐ Neuropsychology, Cognitive Behavioral Therapy (CBT), Cognitive Remediation
- ☐ Post-traumatic seizures: risk factors, prophylactic medications, signs of partial seizure, mortality
- ☐ Seizure precipitants: (i.e. structural, metabolic, infectious, elicit substances, medications)
- ☐ Return to driving considerations: (e.g. medications, reaction time, dual-tasking, intellect, vision, epilepsy, safety record, attention/executive function, family concerns, EtOH, ROM, strength, motor control)
- ☐ Paroxysmal Sympathetic Hyperactivity (clinical presentation)
- ☐ Intracranial Pressure (ICP) Mechanics: Normal values (5–15 mmHg), critical thresholds (greater than 20 mmHg), and physiological consequences of sustained intracranial hypertension
- ☐ Cerebral Perfusion Pressure (CPP)

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