National MajorTrauma Rehabilitation Group

NMTRG Guidelines for the assessment and rehabilitation of the Major Trauma patient

Discipline: Physiotherapy

Guideline 1: Management of TBI

Physiotherapists should have **knowledge** of the following:

- Clinical presentation after TBI (motor, sensory, cognitive-communication, behavioural and perceptual deficits).
- Basic understanding of CT and MRIs, linked to neuro-anatomy and clinical presentation.
- Primary versus secondary injuries.
- Primary injuries: e.g.
    - Mild traumatic brain injury, contusions, diffuse axonal injury, contra coup, subarachnoid haemorrhage, subdural haemorrhage, hypoxic brain injury, etc.
- Secondary injuries, causes and possible consequences.
    - Secondary hypoxia, hypovolemia, cerebral oedema
    - Seizures
- Intracranial dynamics of TBI:
    - Monroe Kellie doctrine and the effects of raised intracranial pressure (ICP) (mass effect, midline shift, hydrocephalus, and herniation).
    - Normal values and relationship between ICP, cerebral perfusion (CPP) and mean arterial pressure (MAP).
    - The concept of cerebral blood flow, autoregulation and risk of cerebral ischemia.

- Neurosurgical management including: conservative and surgical such as decompressive craniectomy/ craniotomy, extra-ventricular drain (EVD).

- The acute management of the TBI patient with ICP monitoring:
    - Analgesia, sedation and paralysing agents
    - Positioning (30 degree tilt and head midline)
    - The use of the ventilator to regulation pCO2 and O2
    - The use of mannitol and hypertonic saline
    - The use of inotropic support

- Patients with Tracheostomy:
    - Clinical indication
    - Weaning process through to decannulation

- The nutritional status and feeding method (oral and alternative).
- The need for family and carer involvement in every stage of the patient's journey/ recovery.
- The need for Multidisciplinary assessment and management
- Mental Capacity Act (2005) and Deprivation of Liberty and Safeguards Act (DOLs).

Physiotherapists should be able to **recognise**:

- Precautions associated with TBI e.g no bone flap, skull base fracture, any other injuries or co-morbidities

- Signs of deterioration in neurological status (e.g. change in GCS, pupil size) and escalation process
- Signs of respiratory deterioration/compromise in relation to the TBI/GCS etc and escalation process.
- Signs of sympathetic storming
- Changes in tonal presentation: posturing patterns (decorticate and decerebrate), spasticity
- Need for caution in managing attachments with special attention to EVD's and position/bed height change/ to follow trust policy in relation to clamping/unclamping of the EVD (e.g. EVD, tracheostomy, feeding tubes…).
- The impact of prolonged immobility and potential secondary complications: pressure sores, contractures, chest infections, confusion, etc.
- Other factors which could have an effect on cognitive function, e.g. alcohol withdrawal, delirium, medication side effect, sodium levels, infection, sunken flap syndrome…

Physiotherapists should be able to offer the following **assessments**:

- Risk assessment (e.g. Task, Individual, Load, and Environment) in line with all of the above.
- Tracheostomy status (if applicable)

- Impairment based assessments (using standardised and non-standardised tools) which may include:
    - Assessment of Prolonged Disorders of Consciousness (PDOC) in line with RCP Guidelines:
        - Considering relevant factors to determine optimal time to start formal and/or informal assessments.
        - Ensuring MDT approach and friends/family involvement
        - Using a range of formal assessments such as Wessex Head Injury Matrix (WHIM), Coma Recovery Scale Revised (CRS-R)
        - Facilitate assessments in different postural sets (seating and tilt-table).
    - Respiratory function (auscultation, palpation, cough, secretions)
    - Muscle strength
    - Range of movement
    - Tone
    - Co-ordination
    - Balance
    - Sensation including touch, proprioception and stereognosis
    - Vision
    - Vestibular including Benign Paroxysmal Positional Vertigo (BPPV) assessment

- Functional assessment that is appropriate to the patients' physical, cognitive, communication and behavioural capacity.

- Functional assessments may be used to identify neurological impairments through observation when formal assessment of impairments is not possible.

The PT should be able to offer the following **interventions:**

- Respiratory management- airway clearance, cough augmentation
- Tracheostomy management:
    - Secretion management
    - Weaning through to decannulation where appropriate
    - Referral to specialist teams (e.g. ENT, max fax, etc)

- Goal directed rehabilitation programme to address impairments and functional limitations using specific approaches and strategies
    - Postural management, including specialist seating and 24 hour positioning programmes where clinically indicated
    - Exercise programmes to improve/maintain: strength, ROM, balance and cardiovascular fitness
    - Use of adjuncts for neuro-rehabilitation such as Functional Electrical Stimulation (FES), taping, bedside cycle ergometry.
    - Gait re-education and use of appropriate aids and technology e.g. partial bodyweight support treadmill training
    - Provision of splints including fabricated soft and scotch resting and functional splints as well as off the shelf products including a pressure relieving ankle foot orthosis (PRAFO)
    - Liaison regarding pharmacological and non pharmacological (weight bearing stretch, tilt-table) management of tone including focal and generalised anti spasmodic benefits
    - Sensory integration – therapeutic handling, use of environment, visual strategies etc
    - Vestibular interventions dependent on assessment findings such as manoeuvres, habituation, substitution and adaptation exercises
    - Equipment prescription e.g. walking aids and orthotics such as helmets and ankle foot orthoses (AFO).

- Other
    - Family advice, support and education
- Complex patient professional meetings
- Brain injury education
    - Use of appropriate outcome measures

The PT is expected to complete these assessments and interventions

- From an early stage post injury in critical care, HDU and all points in the care pathway as clinically indicated.

National MajorTrauma Rehabilitation Group

The PT should have knowledge of **additional services** including:

- Headway and other brain injury charity organisations
- Local specialist teams e.g. pain team, brain Injury team, orthotics, neuropsychiatry and neuropsychology, neuro navigator, older adult liaison team, tracheostomy specialist team, hand therapy team,
- Falls team
- Major Trauma signposting team / legal signposting
- Citizens advice bureau
- Sensory impairment teams
- Drug and alcohol team
- Homeless team
- Youth support for violence intervention
- Adolescent outreach service
- Patient support groups / group rehabilitation
- TBI case management
- Social services

The Physiotherapist understands how to access the following **pathways** and use the Patient Categorisation Tool (PCAT) as needed:

- Specialist Inpatient Category A
- Specialist Inpatient Category B
- Specialist Outpatient Multidisciplinary
- Specialist Outpatient Single Discipline
- Non specialist Inpatient Category C
- Community Specialist MDT
- Community Generic MDT
- Vocational Rehabilitation
- Falls prevention
- Social Care