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PHYSIOTHERAPY

SCENARIO

ACUTE CARE TREATMENT/CONSIDERATIONS

SUB ACUTE TREATMENT

CHRONIC-LONG TERM MANAGEMENT

FAMILY INVOLVEMENT AND EQUIPMENT

SUGGESTED RESOURCES

REFERENCES



Figure 1. Physiotherapy for a patient in traction. (ICRC)

SCENARIO

A 25-year-old man presents to a type 2 facility following a gunshot wound resulting in a left femur fracture without vascular damage.

He subsequently undergoes wound debridement and is placed in traction. The team has only recently become operational and is still in the process of finding referral pathways to a higher level of care.



TYPE 1

Type 1 EMTs should be able to provide basic rehabilitation care or refer patients to an appropriate EMT or existing local facility.



TYPE 2

Must have at least one rehabilitation professional per 20 beds



TYPE 3

Must have at least one rehabilitation professional per 20 beds

KEY POINT

- » EMTs offering rehab services need to be self-sufficient for 2 weeks
- » Supply list should include 6 wheelchairs and 20 crutches per 20 beds.
- » Rehab decisions must take into account the likely logistical constraints of regard the deployment.



TYPE 2

DELIVERY OF PHYSIOTHERAPY TYPE 2 AND 3 FACILITIES:

- Physical therapy benefits bed bound patients with long bone fractures by preventing complications such as pneumonia and muscle contractures.
- The early mobilization of patients on crutches, or simply transferring bed to chair enhances the patient's perception of recovery and helps set the patient up for a safer discharge.



TYPE 3

NURSING AND RESPIRATORY CARE

- » Patients need to be nursed in an upright position as much as possible to optimize respiratory effort.

CONSIDERATIONS FOR AUSTERE ENVIRONMENTS

- » Water bottles can be used as spacers to deliver aerosolized medications to individuals.
- » In bed-bound patients, it is important to encourage re-expansion of the lungs, preventing post operative pneumonia.
- » A bubble positive expiratory pressure (PEP) set up can be easily constructed by partially filling a container water and submerging a tube or straw.
- » When a patient exhales through the tube the bubbles provide a stimulus to encourage good air movement.



Figure 2. Chest physiotherapy can be an important tool to prevent post operative complications (ICRC)

ACUTE REHABILITATION NEEDS

TREATMENT 1-2 TIMES A DAY FOR 30-60 MINUTES

ESTABLISH EARLY MOBILIZATION

- » Depending on the injury and patient's stability, there is evidence of improved systemic function and faster functional recovery with early mobilization.
- » Establish early with medical team the weight bearing status of the patient of all extremities

DEVELOP A PROGRAM TO ENCOURAGE MOBILITY ACCORDING TO WEIGHT BEARING STATUS

- » Work within the weight bearing status to begin sitting up unsupported and mechanisms for transfers out of bed as tolerated.

DEVELOP A PROGRAM FOR ACTIVITY BOTH IN AND OUT OF BED

- » Out of bed activity improves respiratory status, early weight bearing reduces strength loss and improves recovery, and increases patient well being
- » In bed positioning, to prevent contracture, prevention of pressure ulcers, and pain management is imperative.



Figure 3. ICRC patients receive information in preparation for rehabilitation from injury (ICRC)

PREVENTION OF COMMON CONTRACTURES

EQUINUS CONTRACTURE

- » All patients who plan to weight bear in the future need to have a plantigrade foot position.
- » Equinus contractures, which are common in bed-bound, patients will limit rehabilitation potential.
- » These contractures can be prevented by actively dorsiflexing the ankles.
- » If the patient cannot actively dorsiflex, they should passively dorsiflex the foot by wrapping bandage or fabric around the toe of the foot and pulling the free end to provide dorsiflexion.
- » Patients who have no active movement should be splinted into a neutral position unless the calf muscles are being passively stretched.



Figure 4. Strengthening the upper body is essential in patients with lower extremity injuries (V. Hasselman/ICRC)

KEY POINT

- » In any patient who cannot easily dorsiflex the foot past the neutral position, the foot should be splinted into a neutral position when not actively engaged in dorsiflexion exercises, in order to prevent the formation of Equinus contracture.

PITFALL

A well placed pillow has many advantages. It can protect the heels from developing decubitus ulcers and relieve back pain. However, A pillow to flex the knees must be avoided in patients with periarticular knee injuries, femoral shaft fractures, tibial shaft fractures, and below knee amputations. A pillow causing persistent flexion of the knee can result in a contracture that limits the patients future ambulation.

SUB ACUTE REHABILITATION NEEDS

DAILY TREATMENT 30-60 MINUTES 1-2 TIMES PER DAY

KEY TENANTS OF SUB-ACUTE REHABILITATION OF THE LOWER EXTREMITY

- » Initiate the patient's activities of daily living as able and create a schedule for getting out of bed.
- » Emphasize range of motion work, progressing from passive to active range of motion activities.
- » Increase weight bearing as appropriate depending on patient tolerance.
- » Exercise uninvolved limbs and gradually increase the exercise of the involved limb as appropriate.
- » Continued positioning and stretching of patient when in bed.
- » Introduce stump wrapping for amputees, to encourage stump shaping and prepare the limb for eventual prosthetic training.

KEY TENANTS OF SUB-ACUTE REHABILITATION OF THE UPPER EXTREMITY

- » Joints not involved in the injury should be mobilized early and often, i.e. a patient with external fixation of a forearm fracture should receive routine mobilization of the shoulder and scapula.
- » Mobility of the upper extremity is crucial. Patients must have assistance with, and learn to position distal and proximal joints when at rest to prevent soft tissue contractures.
- » The extremities contralateral to the injury should routinely undergo full active range of motion, even while the patient requires assisted range of motion for the injured limb.
- » Introduce stump wrapping for amputees and continue training for performance of activities of daily living following upper extremity amputation.

CHRONIC LONG REHABILITATION NEEDS DAILY TREATMENT 30-60 MIN BY REHABILITATION PROFESSIONAL WITH PERFORMANCE OF HOME REGIMEN BY PATIENT

AMPUTATIONS

- » Discharge planning must be established early to prepare the patient and family for successful transition to home care.
- » Following earlier rehabilitation phases the continued rehabilitation needs for patients following amputation include: Continued gait training, teaching for activities of daily living, strength training, and prosthesis and limb preservation training.
- » All activities should involve the patient's support system as much as possible.

PROSTHETIC PLANNING AND TRAINING

- » It is important to consider the length of deployment and prosthetic and rehabilitation resources within an EMT when planning for amputee rehabilitation and prosthetic training.
- » Patients will require resources for long term maintenance prostheses. The rehabilitation professional should engage with local resources to make these connections to enable the patient to continue with his/her management in the community.

OTHER CONSIDERATIONS

- » The greater the comorbidities or other injuries of a patient, the longer the amputee requires for positioning and the longer time the patient should spend in earlier phases of rehabilitation.
- » Other adaptive equipment must be required or adjusted for complications such as multiple amputations, traumatic brain injury, or spinal cord injury.

CHRONIC LONG REHABILITATION NEEDS TREATMENT DAILY 30-60 MIN BY REHABILITATION PROFESSIONAL AND HOME PROGRAM BY PATIENT

ORTHOTICS

- » Orthotics are important but often overlooked devices that facilitate improvements in function after peripheral nerve injury in the limbs.
- » Orthotics are utilized both during healing as well as during the return to mobility.
- » Orthotics assist in positioning during healing as well as compensates for the loss or weakness of muscle action to improve functional capacity.
- » Orthotics can be easily fabricated with moldable materials and soft bandages for positioning, comfort, and prevention of skin breakdown.
- » Orthotics are an inexpensive assistive devices that can make large improvements in functional status following limb injury.
- » Patients with nerve damage following injury, require orthotics just as amputees require prosthetics.

COMMUNITY CARE

- » Continued long term treatment and follow up by a medical professional and rehabilitation specialist is appropriate for up to one year following a limb injury.
- » The EMT rehabilitation specialist will need to gather and provide information for their patients regarding how to engage local care resources following the disaster or conflict.



Figure 5. A patient receives adjustments to her prosthetic leg. She was 14 years old when injured by a landmine. (ICRC)

FAMILY INVOLVEMENT AND EQUIPMENT

FAMILY INVOLVEMENT

- » Families need to be involved in patient treatment.
- » Families are an important member of the discharge planning.
- » For carry over and consistency and to combat complications, families must be trained in their loved ones care.
- » Teaching family positioning, mobility, and pain management practices improved patient outcomes and compliance.

SUGGESTED ALTERNATIVES

- » If certain equipment is unavailable in areas of disaster and conflict:
 - » Wheel chair alternative
 - Chair with something to elevate lower extremities
 - » Walker alternative- crutches
 - » Crutches alternative-Walking sticks
 - » Slide board alternative-Board with a sheet
 - » Platform walker alternative-Pushing a tray table or wheelchair
 - » Cane alternative-Walking stick
 - » Gait belt alternative-Sheet, belt
 - » AFO/ Orthotics- Wood or plastic uprights with bandaged wrap.



Figure 6. Fitting a wheelchair bound patient with walking splints (ICRC)

SUGGESTED RESOURCES

1. Skelton P, Harvey A, eds. *Rehabilitation in Sudden Onset Disasters*. 1 ed. Online: Handicap International, UK Emergency Medical Teams; 2015.

REFERENCES

1. Landry MD, O'Connell C, Tardif G, Burns A. Post-earthquake Haiti: the critical role for rehabilitation services following a humanitarian crisis. *Disability and rehabilitation* 2010; **32**(19): 1616-8.
2. Clini E, Ambrosino N. Early physiotherapy in the respiratory intensive care unit. *Respiratory medicine* 2005; **99**(9): 1096-104.
3. Rathore FA, Gosney JE, Reinhardt JD, Haig AJ, Li J, DeLisa JA. Medical rehabilitation after natural disasters: why, when, and how? *Archives of physical medicine and rehabilitation* 2012; **93**(10): 1875-81.
4. Norton I, Von Schreeb J, Aitken P, Herard P, Lajolo C. Classification and minimum standards for foreign medical teams in sudden onset disasters. Geneva: *World Health Organization* 2013.
5. Chackungal S, Nickerson JW, Knowlton LM, et al. Best practice guidelines on surgical response in disasters and humanitarian emergencies: report of the 2011 Humanitarian Action Summit Working Group on Surgical Issues within the Humanitarian Space. *Prehosp Disaster Med* 2011; **26**(6): 429-37.
6. Walsh L, Subbarao I, Gebbie K, et al. Core competencies for disaster medicine and public health. *Disaster medicine and public health preparedness* 2012; **6**(01): 44-52.
7. Reinhardt JD, Li J, Gosney J, et al. Disability and health-related rehabilitation in international disaster relief. *Global health action* 2011; **4**.

EMT Website: <https://extranet.who.int/emt/page/home>
 AO/ICRC/WHO Training Resources: <http://www.aofoundation.org/icrc>