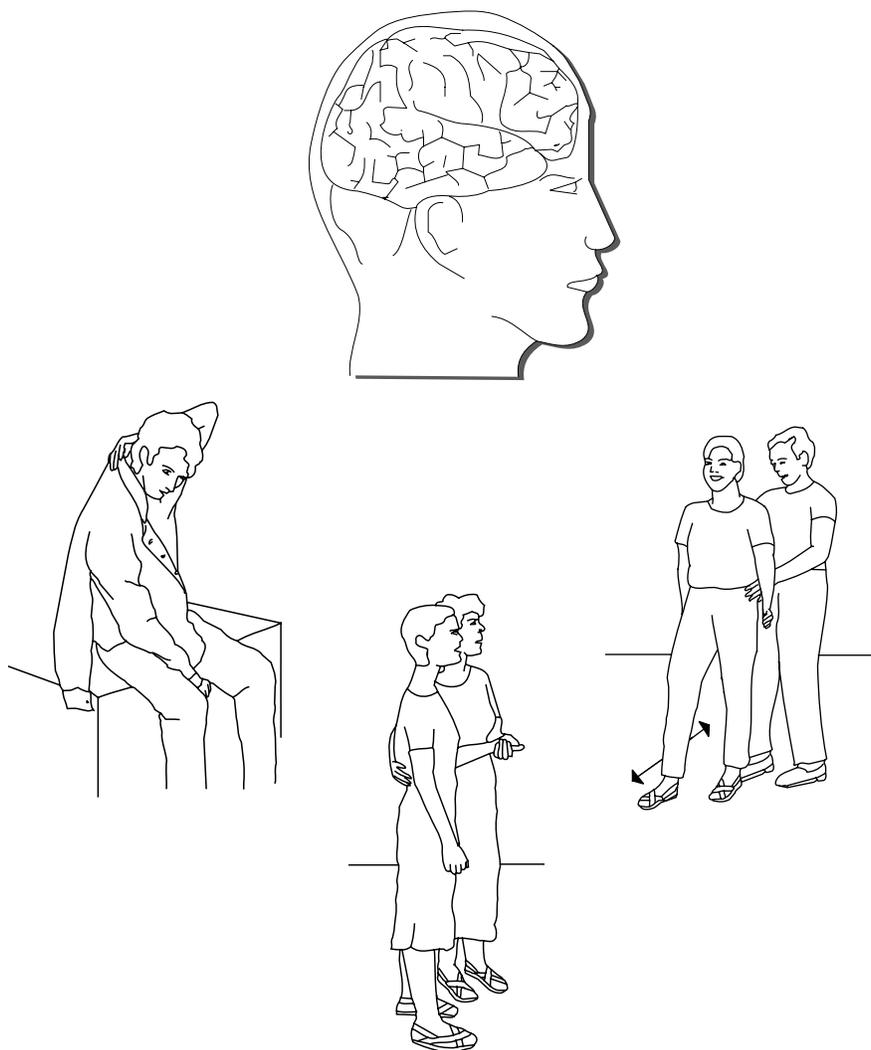


# Rehabilitation for Persons With Traumatic Brain Injury



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## **Abstract**

This manual was developed as an educational and instructional tool for mid-level rehabilitation workers and primary health care personnel, to use in their work with persons who have sustained traumatic brain injury, their families and members of their communities.

Common medical, physical, cognitive and behavioral consequences of brain injury are reviewed. The manual emphasizes basic information for helping caregivers and community members, including teachers and potential employers, to better understand brain injury and to support an injured person's rehabilitation process.

Safety recommendations and care guides are provided, as well as training techniques for helping the person to relearn functional skills in mobility, communication and personal care. The writers recognize that specialized medical equipment is not always available, so suggestions are provided for using local materials to make devices to help prevent deformities and to assist persons with physical impairments in performance of everyday tasks.

Drawings are provided to help clarify safety guides, training instructions and the steps involved in making specific adaptive devices.

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## FOREWORD

Rehabilitation following a traumatic brain injury (TBI) is a complicated and challenging process for the person who was injured, the family, and all of the rehabilitation personnel who contribute to the process. In natural disasters and wars, where there may be many people with TBI, the request arises for a comprehensive approach to deal with the multiple disabilities each injured person experiences. Rehabilitation personnel working in developing countries have also requested information about a comprehensive approach for working with people with TBI.

This manual is a response to these requests. The manual is intended for people working in both general health care and rehabilitation services, in both emergency and routine services. It can be used for training personnel and as a guide when working with people with TBI. Personnel may also wish to give this manual to family members of people with TBI in order to help the families to understand the multiple limitations in function that may result from TBI, and to guide them in ways to help in the rehabilitation process.

We are extremely grateful to the people who recognized the need for this manual and took action to provide it. Mr Amit Pandya, as Director, Office of Humanitarian Assistance, United States Department of Defense (now Member of the Policy Planning Staff, Office of the Secretary of State, United States Government), lent much needed support at the United States Pentagon to secure the funding for this manual. Commander John C. Olsen, MD, as United States Navy Civil-Military Medical Policy Analyst, Office of Humanitarian Assistance, (now Medical Director, TRICARE Pacific Lead Agency, Honolulu, HI) provided much appreciated support in the conceptual, funding and editing stages of the manual's preparation. Dr John Melvin, current President of the International Federation of Physical Medicine and Rehabilitation, and Vice-President for Medical Affairs, MossRehab Hospital in Philadelphia, Pennsylvania, USA, kindly offered the services of his staff for the preparation of this manual. Dr Patricia Graham, in conjunction with the MossRehab Hospital staff, served as DoD-WHO Consultant-Liaison in the preparation of grant proposals and during the editing process.

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## PURPOSE OF THE MANUAL

The purpose of this manual is to assist the training of Mid-Level Rehabilitation Workers (MLRWs) and Primary Health Care Personnel (PHCP) who work with people who have experienced traumatic brain injury (TBI). After training, it is hoped that the manual will be a useful reference for review of medical and rehabilitation issues concerning persons with TBI and their caregivers.

The manual was prepared for primary health care personnel, (nurses, doctors and medical assistants) as well as rehabilitation workers because many types of personnel are needed in the brain injury rehabilitation process. The contents of this manual will help all health care personnel to understand the different types of disabilities that can result from traumatic brain injury, so that they may work more effectively with the individual person, the person's family and the community.

Traumatic brain injuries cause disabilities for men, women and children in all countries. Injuries are caused by road accidents, work-related accidents, violent acts, falls and accidents in sport or play activities. Sometimes there are additional causes, such as natural disasters, war or land mines.

In the past, little could be done to treat brain injuries and most severely injured people died. Today, improved medical procedures make it possible for more people to survive even the most severe brain injuries. However, survivors are often left with disabilities that affect their lives as well as the lives of their family members. Disabilities from brain injury include difficulties with movement, memory, thinking, communication and behavior.

Sometimes brain injury effects are clearly seen, such as when the person has obvious physical changes or difficulty with movement. However, many people with brain injury have disabilities that primarily relate to memory and thinking. Such persons may not be significantly changed in appearance or physical ability, so their disabilities may be much more difficult for the family and community to understand.

An important role for health care personnel is to help the person, family and community to understand all disabilities from brain injury, and to learn how to assist an injured person to recover as many abilities as possible.

This manual emphasizes that many people with TBI will need help from others for a very long time, perhaps for the rest of their lives. Nevertheless, with understanding, assistance and training, many people with TBI can return to useful roles and activities, including household responsibilities, school or work.

This manual has four sections. **Section 1** explains what happens to the brain when it is injured and also provides information on prevention of brain injuries.

**Section 2** presents an overview of common medical, physical, cognitive and behavioral consequences of brain injury, including general guides for helping the person relearn functional skills. Because this manual is directed to Primary Health Care personnel as well as Mid-Level Rehabilitation Workers, this section includes information on the medical care that is often needed immediately following a brain injury.

**Section 3** provides recommendations for the care and safety of the person at home and in the community. This includes information that can be given to people in the community so that they will better understand and support an injured person's rehabilitation process. Although health care personnel do not meet with community members to discuss individual situations, information can be given to involved families to share with their neighbors or with members of the larger community.

**Section 4** is the longest section of the manual and presents detailed recommendations and descriptions of strategies and techniques for helping people relearn specific skills. These include skills needed for self-care, communication, ambulation and participation in homemaking, school and work activities.

Both men and women can have traumatic brain injuries so information in this manual alternates in gender reference and illustrations show both men and women.

Some readers may want additional general information about disabilities, to present to family members or others in the community. The manual concludes with a Reference List of other WHO materials that relate to the subjects presented in Rehabilitation for Persons With Traumatic Brain Injury.

# 1

## INTRODUCTION TO REHABILITATION FOR PERSONS WITH TRAUMATIC BRAIN INJURY

### 1.1 Basic Information About the Brain

Understanding Traumatic Brain Injury begins with basic information about the brain. The brain is the control center for the entire body. It controls and directs all of the body's actions and functions. The brain is made up of four main areas:

**The Brainstem.** The brainstem connects the brain to the spinal cord. The brainstem directs the functions of our internal organs, including breathing, blood pressure and heart beat. The brainstem also controls our ability to be awake, alert and conscious.

**The Cerebellum.** The cerebellum controls and coordinates the way our muscles allow us to move and maintain our balance.

**The Limbic System.** The limbic system is a group of structures located deep in the brain. The limbic system controls our strongest emotions and our most basic human needs, such as food, water, sex, and self-protection.

**The Cortex.** The cortex is the area of the brain that controls our ability to gather information from the environment and use that information in everyday activities. The cortex is made up of four areas, called Lobes.

**The Parietal Lobe** controls our awareness of sensations such as touch, pain and temperature. It helps us to make sense our environment.

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