MINISTRY OF HEALTH AND SOCIAL PROTECTION
OF THE POPULATION
REPUBLIC OF TAJIKISTAN

World Health Organization
REGIONAL OFFICE FOR Europe

MANAGEMENT OF POLIOMYELITIS

Abstract

This publication describes the rehabilitation interventions and assistive devices which can help people with chronic poliomyelitis to become more independent, engage in education or work and join in the social life of their community. It is targeted at rehabilitation personnel (doctors, nurses, physiotherapists, occupational therapists, social workers, community workers, etc.) involved in the rehabilitation of persons with disabilities, and is based on the results of a wide-ranging rehabilitation assessment of people with poliomyelitis in Tajikistan. This information booklet is dedicated to all people with poliomyelitis in Tajikistan and to their families.

Keywords

Management of poliomyelitis

1. Poliomyelitis. 2. Rehabilitation. 3. Orthopaedic devices. 4. Orthosis. 5. Mobility limitation. 6. Disabled persons – rehabilitation. 7. World Health Organization.

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Reference materials – Werner D. Disabled village children. Palo Alto, CA: Hesperian Foundation; 2009.

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This guide is designed to support doctors, physiotherapists, occupational therapists, orthotists and nurses in Tajikistan working with children with poliomyelitis and their families.

WHAT IS POLIOMYELITIS?

Poliomyelitis or infantile paralysis is a viral infection that affects the nerves of the **spinal cord,** located inside the spinal bones (vertebrae) at the back of the body. This infection can cause permanent paralysis of muscles. Poliomyelitis mostly affects children up to 15 years of age, but can affect adults too. After the acute phase, the disease is not communicable to others. Since poliomyelitis does not affect the brain, the intellectual ability of children with poliomyelitis remains intact.

Recovery after poliomyelitis takes place in three stages.

1. ***Acute phase*:** (i.e. the first half-year) is a time when there can be a lot of pain, so children are often left to lie quietly. This frequently results in contractures.[1] The incidence of contractures can be markedly reduced with gentle exercises and proper positioning.
2. ***Convalescent phase*:** (i.e. the next 2–3 years) is a time when there may be some gradual recovery of muscle strength. Exercises to prevent contractures are continued, and an effort is made to gradually get the child active.
3. ***Chronic phase*:** After 2–3 years, recovery of muscle strength stops. At this point, plans need to be made to get the child up and walking if possible, using crutches and/or orthoses. During this phase, surgery is often needed to allow the child to fit comfortably into the orthosis, or to move muscles into a different position to reduce deformity due to uneven muscle pull. In Tajikistan, by 2015, all children who contracted poliomyelitis during the 2010 epidemic will now be in the chronic phase of rehabilitation, which lasts for the rest of the child's life.

[1] A contracture is a shortening of muscles, tendons or other tissue which often leads to rigidity and deformity of the joints.

WHAT CAN WE DO FOR CHILDREN WITH CHRONIC POLIOMYELITIS PARALYSIS?

Rehabilitation plan

Doctors and therapists need to decide what each child will be capable of doing within the limits of his/her muscle weakness. This is recorded in a **rehabilitation plan**. Part of the planning is to decide what sort of assistive devices the child needs.

Exercises to reduce contractures

Range-of-motion exercises: Each joint in the body can move a specific amount. We call this the "range of motion" of the joint. Through passive and active range-of-motion exercises, we try to maintain the normal amount of movement in all joints in order to prevent contractures. However, range-of-motion exercises should be conducted properly, carefully, and always respecting each child's limitations. For example, we should respect the limits of each joint movement and never go beyond the normal amount. Range-of-motion exercises should be done slowly and gently. The person performing the exercises should remember that it is easy to use too much force and injure the child. Typical range-of-motion exercises needed for children who have had poliomyelitis are: hip extension, knee extension, ankle dorsiflexion, wrist extension and thumb abduction and opposition. Other joints may also need exercises, and the child's doctor will suggest these as necessary.

Range-of-motion exercise

Warning: Don't overstretch joints in children, they are very flexible!

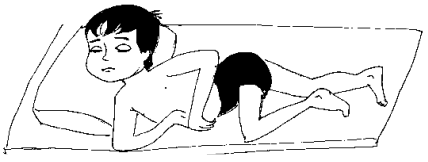
Stretch into hip extension on the right

Hip abduction

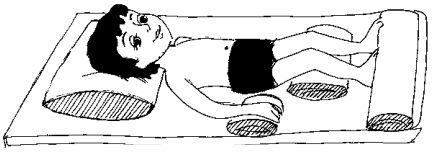
Knee extension stretch

Positioning

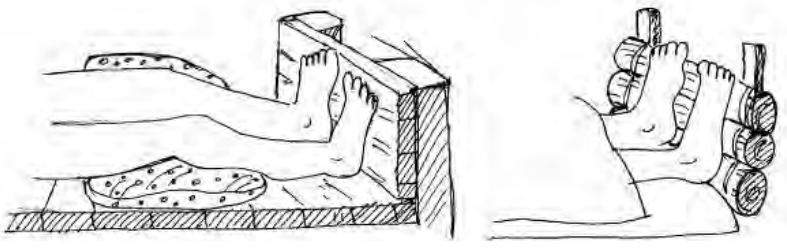
Ensuring that the child sits with his/her feet flat on the floor in a child-sized chair (proper positioning) can help to prevent the development of foot contractures. Making certain that the person does not always lie or sit in one position can help to prevent tightness and contractures.



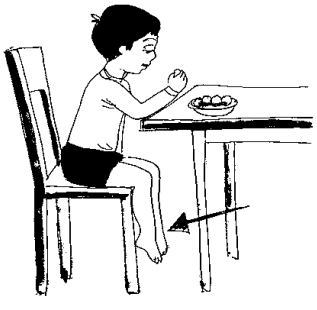
Incorrect position



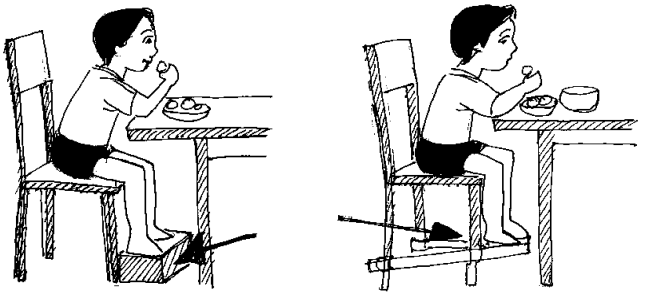
Correct position



Foot supports for sleeping and resting



Feet unsupported (incorrect)



Feet supported (correct)

Assistive devices

Splint

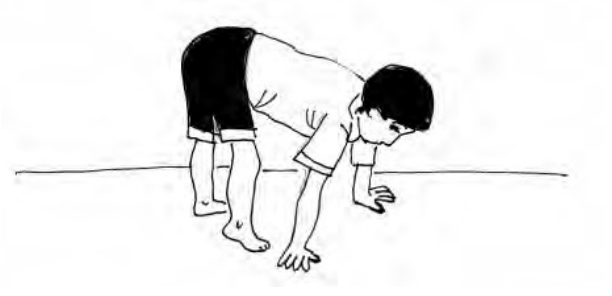
A splint is a device designed to keep a part of the body in a normal position or a symmetrical posture. A splint may be used to facilitate and assist movement, support weak muscles and avoid contractures and deformities.

A splint may be used during therapy (for standing and walking) or for a short period of time after surgery or trauma to support a body part during healing. Sometimes, a splint is used at night when the child sleeps. The use of a night splint is suggested when a major goal is to avoid deformities and contractures.

Orthosis

An orthosis provides support for a weak body part and thus allows a person to function better, e.g. to walk.

If poliomyelitis has left a child with permanent muscle weakness (paralysis), an orthosis will be needed for life. For example, if the thigh muscles (quadriceps) are too weak to straighten the child's knee, using an orthosis may allow the child to walk.



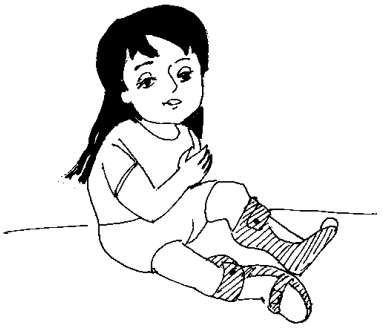
Child with weak thigh muscles unable to walk without orthoses

Things you should bear in mind about an orthosis

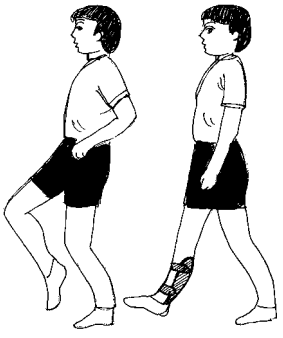
- As the child grows, a new orthosis will be required frequently.
- We should pay special attention to any reddened areas of the skin that may be seen when the orthosis is removed. If the redness persists for more than 15 minutes, it may indicate that the orthosis needs to be adjusted. If there is actual skin breakdown (a sore) the orthosis needs to be adjusted urgently!
- The child must be trained to use the orthosis in order to gain confidence in his/her ability to use it, e.g. to walk.

Typical orthoses used with children who have had poliomyelitis

AFO – ankle-foot orthosis



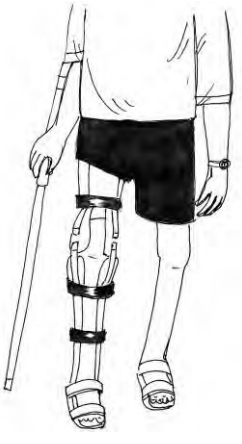
Child with AFO



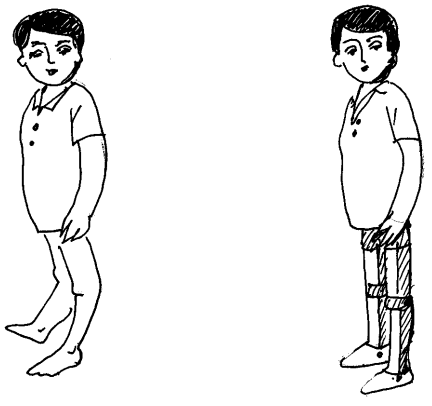
Adult with foot drop (without and with orthosis)

KAFO – knee-ankle-foot orthosis

Child with KAFO and forearm crutches

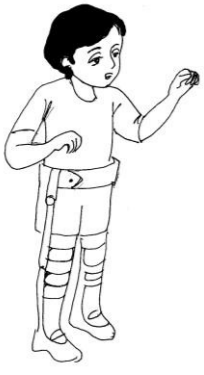


Adult with unilateral KAFO and stick



Child with back knee position corrected by KAFOs

HKAFO – hip-knee-ankle-foot orthosis



Child with HKAFO

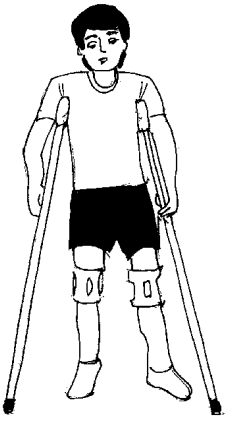
As you can see, the orthosis is named for the joints that it is used to support or assist. Most children will need AFOs or KAFOs.

Crutches and walkers

Crutches and walkers are used by children to support themselves during standing and walking. Walkers are very helpful for children with poor balance and weak muscles. Crutches can be very helpful for children with stronger muscles. Both can help people with poliomyelitis gain balance, confidence and, ultimately, the ability to walk on their own. There are two types of crutches available in Tajikistan. Axillary crutches (where the child's weight is supported under the armpits) are usually prescribed for children who have weak muscles in their arms, legs or trunk. Forearm crutches are usually prescribed for children who have stronger muscles in their arms and legs.

Initially, try different combinations of assistive devices and observe which is the safest and most comfortable option for each child. As the child gets stronger and more confident, you should re-evaluate and assess whether a different device is needed. For example: a child who started by using a walker may become stronger and more confident after some time. This child may then be ready to change to crutches and walk with less support.

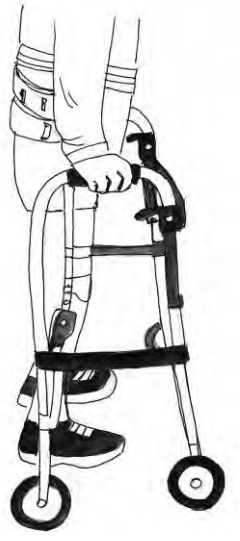
Forearm crutches



Axillary crutches

Platform wheeled walker

Reverse wheeled walker



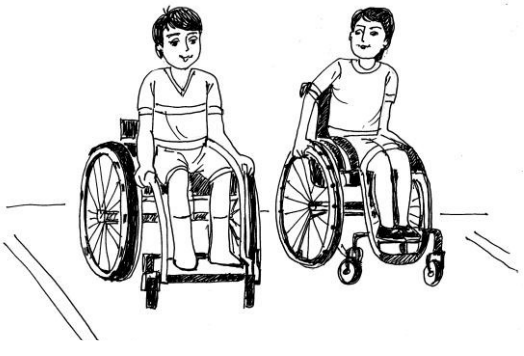
Remember: with the correct use of assistive devices, most children will be able to stand up, walk, play and go to school. When choosing the assistive device, we should always aim for the maximum level of independence, comfort and confidence with the minimum level of support!

Standard wheeled walker

Wheelchair

For a few children with poliomyelitis, wheelchairs can be an important component of their rehabilitation. Wheelchairs are usually prescribed for children who are unable to walk even with assistive devices.

Wheelchairs should also be considered for those children who have difficulty walking long distances. In addition, a child who can walk a fair distance but tires very quickly may need a wheelchair at school or during other community activities.



Children in wheelchairs racing

Girl in a wheelchair playing

Strengthening exercises

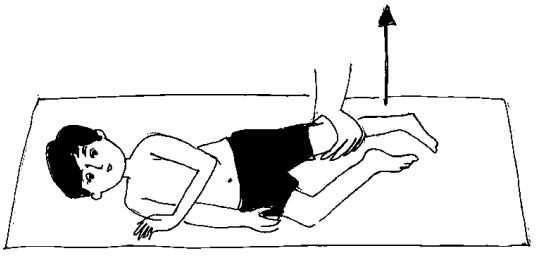
The rehabilitation plan should establish a specific programme of strengthening exercises that will help the child to be as independent as possible.

When a child is doing these exercises, you should bear in mind the need to avoid fatigue and exhaustion.

Exercises should be planned to:

- keep the child active
- prevent muscle weakness
- increase or maintain muscle strength
- prevent deformities.

Exercises for strengthening the arms and improving balance are highly recommended.



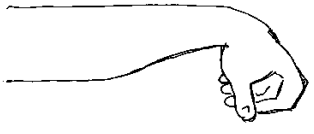
Hip abductor strengthening: child pushing leg up, parent providing resistance by pushing down

Strengthening exercises need to be scaled up as the child's strength increases. For example, a child may start with 5–10 repetitions of the exercises two or three times a day. As the child gets stronger, he/she may work up to 20–30 repetitions. Once the muscle is strong enough for the child to use it properly while moving, then moving alone should maintain the child's strength.

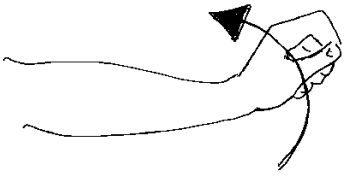
Substitution

People who have had poliomyelitis learn that if one muscle cannot do the work, sometimes another muscle can take over and do the job effectively. This is fine if it is not possible to strengthen the correct muscle. However, if you want to strengthen the correct muscle, you have to make sure that the muscle that was being used to substitute for it is not working at the same time. For example, if you want to strengthen the tibialis anterior you do not want the toe extensors to substitute. So you need to remove the influence of the toe extensors. You ask the child to flex or bend his/her toes and, while keeping the toes bent, you ask the child to dorsiflex, or pull the foot up. This should allow the tibialis anterior to do the work instead of the toe extensors.

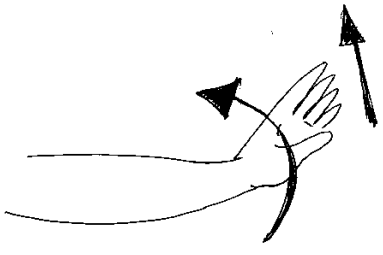
Additional examples of common substitutions are using the soleus instead of the gastrocnemius (calf muscles) to stand on your toes. If you stand on your toes using the gastrocnemius, you do it keeping your knee straight. If you use your soleus muscle, you will bend your knee as you rise up on to your toes. If you have weak wrist extensor muscles (the muscles that pull your wrist up), you may substitute by using your finger extensors so that you straighten your fingers out as you bring up your wrist. This makes it difficult to hold something in your hand. Health professionals should consider the issue of substitution when teaching strengthening exercises to ensure that the child strengthens the correct muscle.



Wrist in flexion



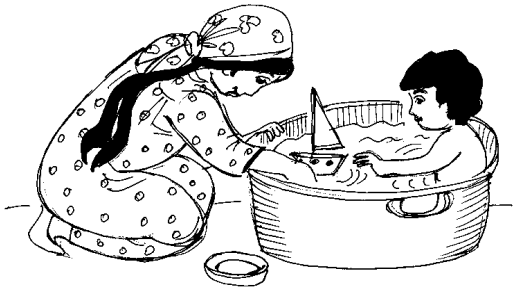
Wrist extensors working correctly to extend wrist



Substitution of finger extensors to provide wrist extension

Activities are extremely important, and can be considered the core of the rehabilitation plan for any child with poliomyelitis. Eating and drinking, going to the toilet and bathing and dressing independently, playing with other children, attending school, assisting at home and during community activities: daily life activities in general are an essential component and a large part of the rehabilitation plan.

Remember: staying at home and being inactive will not improve a person's physical condition or general well-being. People with poliomyelitis should always remain active!



Bathing

Dressing

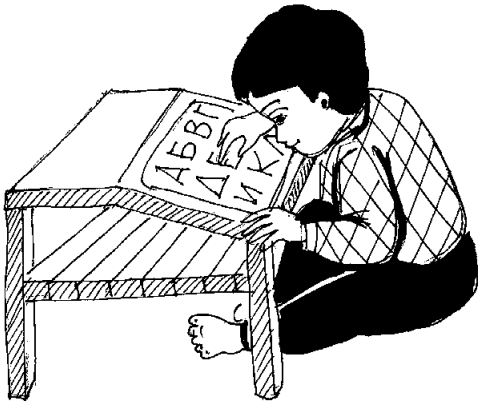
Playing

Surgery

Doctors will need to decide whether surgery will help. An operation may help the child fit more easily and comfortably into an orthosis. Or surgery may be needed to correct or prevent deformities that are continuing in spite of exercises. Sometimes moving the muscle tendons in order to change their action will help a child to be more independent.

EDUCATION, WORK AND SOCIAL PARTICIPATION

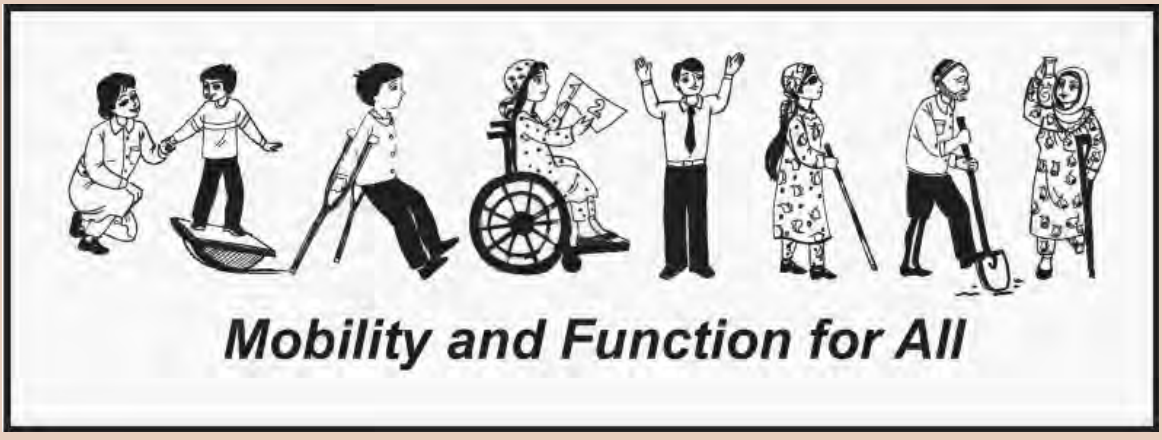
We should make sure that all children with poliomyelitis have access to education in order to prepare them for making a living and participating in social activities. Ideally, these activities should run in parallel with any rehabilitation plan. However, if rehabilitation services are not available in the area, people with poliomyelitis should be strongly encouraged to participate in all possible social events and other activities with the support of the local community.



REMEMBER THAT YOUR SUPPORT CAN CHANGE PEOPLE'S LIVES!

"Break Barriers, Open Doors: for an inclusive society and development for all"

READER'S NOTES



Disability and Rehabilitation Programme

Breaking Barriers to Include All

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