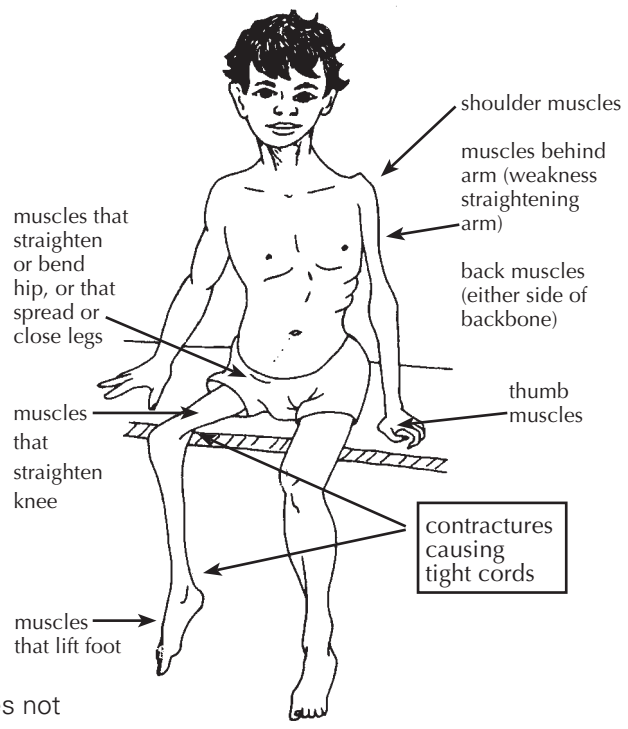
Polio
Infantile Paralysis

CHAPTER 7

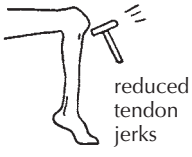
HOW TO RECOGNIZE PARALYSIS CAUSED BY POLIO

- ***Paralysis*** (muscle weakness) usually begins when the child is small, often during an illness like a bad cold with fever and sometimes diarrhea.
- Paralysis may affect any ***muscles*** of the body, but is most common in the legs. Muscles most often affected are shown in the drawing.
- Paralysis is of the **'floppy'** type (not stiff). Some muscles may be only partly weakened, others limp or floppy.
- In time the affected limb may not be able to straighten all the way, due to shortening, or ***'contractures'***, of certain muscles.
- The muscles and bones of the affected limb become thinner than the other limb. The affected limb does not grow as fast, and so is shorter.

MUSCLES COMMONLY WEAKENED BY POLIO



- Unaffected arms or legs often become extra strong to make up for parts that are weak.
- **Intelligence** and the mind are not affected.
- **Feeling** is not affected.
- 'Knee jerks' and other ***tendon*** reflexes in the affected limb are reduced or absent. (In cerebral palsy, 'knee jerks' often jump more than normal. See p. 88.) Also, the paralysis of polio is 'floppy'; limbs affected by cerebral palsy often are tense and resist when straightened or bent (see p. 102).



- The paralysis does not get worse with time. However, secondary problems like contractures, curve of the backbone and ***dislocations*** may occur.

Of children who become paralyzed by polio:

30% recover completely in the first weeks or months.

30% have mild paralysis.

30% have moderate or severe paralysis.

10% die (often because of difficulty breathing or swallowing).

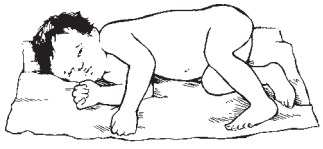
BASIC QUESTIONS AND ANSWERS ABOUT POLIO

Paralysis in one leg

How common is it? In many countries, polio—or 'poliomyelitis'—was for many years the most common cause of physical disability in children. In some areas, one of every 100 persons may have had some paralysis from polio. ***Vaccination*** programs have ended polio in most countries, but it is still a problem in Afghanistan, Nigeria, and Pakistan.

What causes it? A ***virus (infection).*** The infection attacks parts of the ***spinal cord,*** where it damages only the ***nerves*** that control movement. In areas with poor hygiene and lack of latrines, the polio infection spreads when the ***stool*** (shit) of a sick child reaches the mouth of a healthy child. Where sanitation is better, polio spreads mostly through coughing and sneezing.

Do all children who become infected with the polio virus become paralyzed? No, only a small percentage become paralyzed, about 1 out of every 100 to 150 children who are exposed to the virus. Most only get what looks like a bad cold, with fever, vomiting or diarrhea.



Severe paralysis

Is the paralysis contagious? No, not after 2 weeks from when a child first gets sick with polio. In fact, most polio is spread through the stool of non-paralyzed children who have 'only a cold' caused by the polio virus.

At what age do children get polio? In areas with poor sanitation, polio most often attacks babies from 8 to 24 months old, but occasionally children up to age 4 or 5. As sanitation improves, polio tends to strike older children and even young adults.

Who does it most often affect? Boys, a little more than girls. Unvaccinated children much more often than vaccinated children, especially those living in crowded, unsanitary conditions.

How does the paralysis begin? It begins after signs of a cold and fever, sometimes with diarrhea or vomiting. After a few days the neck becomes stiff and painful and parts of the body become limp. Parents may notice the weakness right away, or only after the child recovers from the acute illness.

Once a child is paralyzed, what changes or improvements can be expected? Often the paralysis will gradually go away, partly or completely. Any paralysis left after 7 months is usually permanent. The paralysis will not get worse. However, certain secondary problems may develop—especially if precautions are not taken to prevent them.

What are the child's chances of leading a happy, productive life? Usually very good—provided the child is encouraged to do things for himself, to get the most out of school, and to learn useful skills within his physical limitations (see p. 497).

Can a person with polio marry and have normal children? Yes. Polio is not inherited (familial) and does not affect ability to have children.

SECONDARY PROBLEMS TO LOOK FOR WITH POLIO

By **secondary** problems, we mean further disabilities or complications that can appear after, and because of, the original disability.

CONTRACTURES OF JOINTS

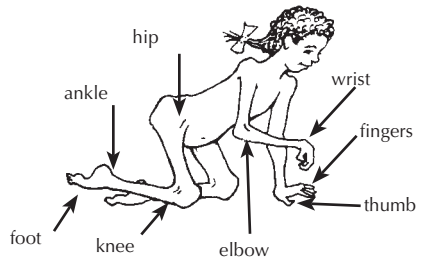
A contracture is a shortening of muscles and tendons (cords) so that the full range of limb movement is prevented.

Unless preventive steps are taken, joint contractures will form in many paralyzed children. Once formed, often they must be corrected before braces can be fitted and walking is possible. Correction of advanced contractures, whether through exercises, casts, or surgery (or a combination), is costly, takes time and causes discomfort. Therefore **early prevention of contractures is very important.**

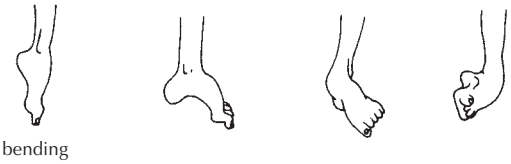
A full discussion of contractures, their causes, prevention, and treatment is in the next chapter (Chapter 8). Methods and aids for correcting contractures are described in Chapter 59.

TYPICAL CONTRACTURES IN POLIO

A child with paralysis who crawls around like this and never straightens her legs will gradually develop contractures so that her hips, knees, and ankles can no longer be straightened.



TYPICAL DEFORMITIES OF ANKLE AND FOOT

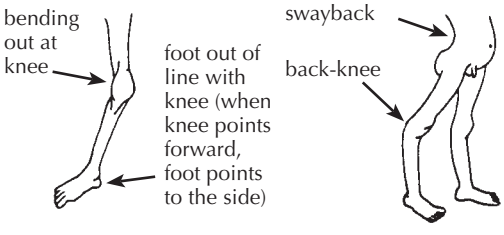


bending down at ankle (tiptoe contracture) | bending down at mid-foot | bending out at ankle | bending in at ankle

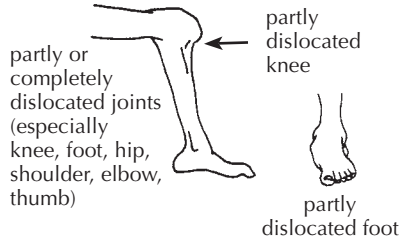
OTHER COMMON DEFORMITIES

Weight bearing (supporting the body's weight) on weak joints can cause deformities, including:

OVER-STRETCHED JOINTS



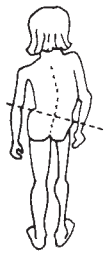
DISLOCATIONS



WARNING:
Dislocations like these are sometimes caused by stretching contractures incorrectly. (See p. 28.)

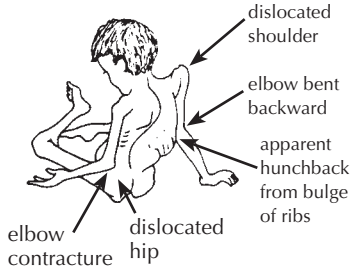
SPINAL CURVE

Minor curve of spine can be caused by tilted hips, as a result of a short leg.



More serious curve of the ***spine*** is caused by muscle weakness of the back or body muscles. The curve can become so severe that it endangers life by leaving too little room for the lungs and heart.

a severely paralyzed child



At first, the spinal curve straightens when the child is positioned better. But in time the curve becomes more fixed (will not straighten any more). For information on spinal curves, see Chapter 20.

WHAT OTHER DISABILITIES CAN BE CONFUSED WITH POLIO?

- Sometimes **cerebral palsy** can be mistaken for polio—especially cerebral palsy of the 'floppy' type.

However, **cerebral palsy** usually affects the body in typical patterns:

Polio has a more irregular pattern of paralysis:

In cerebral palsy, usually you can find other signs of brain damage: over-active knee jerks and abnormal reflexes (see p. 88), developmental delay, awkward or uncontrolled movement, or at least some muscle tenseness (*spasticity*).

- In **muscular dystrophy,** paralysis begins little by little and steadily gets worse (see p. 109).

- **Hip problems** (see p. 155) can cause limping, and muscles may become thin and weak. Check hips for pain or dislocations. (**Note:** Dislocated hip may also occur secondary to polio.)

Note: Polio can occur before or after a child has any of these other problems. Check carefully.

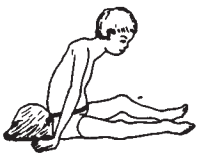
- **Clubbed foot** is present from birth (see p. 114).

- **'Erb's palsy',** or partial paralysis in one arm and hand, comes from birth injury to the shoulder (see p. 127).

- **Leprosy.** Foot and hand paralysis begins gradually in older child. Often there are skin patches and loss of feeling (see p. 215).

- **Spina bifida** is present from birth. There is reduced feeling in the feet, and often a lump (or scar from surgery) on the back (see p. 167).

ALWAYS EXAMINE THE BACK IN A CHILD WITH PARALYSIS OF THE LEGS, AND CHECK FOR FEELING.



- **Injuries to the spinal cord** (see p. 175) or to particular nerves going to the arms or legs. There is usually a history of a severe back or neck injury, and loss of feeling in the paralyzed part.

- **Tuberculosis of the spine** can cause gradual or suddenly increasing paralysis of thelower body. Look for typical bump on spine (see p. 165).

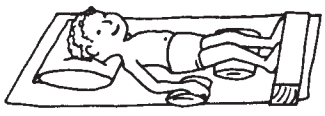
- **Other causes of paralysis or muscle weakness.** There are many causes of floppy paralysis similar to polio. One of the most common is **'Guillain-Barre' paralysis.** This can result from a virus infection, from poisoning, or from unknown causes. It usually begins without warning in the legs, and may spread within a few days to paralyze the whole body. Sometimes feeling is also reduced. Usually strength slowly returns, partly or completely, in several weeks or months. *Rehabilitation* and prevention of secondary problems are basically the same as for polio.

WHAT CAN BE DONE?

DURING THE ORIGINAL ILLNESS, when the child first becomes paralyzed:

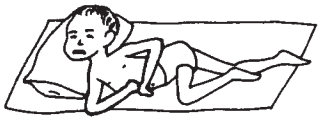
- **No medicines** help, either during the first illness, or later.
- **Rest** is important. **Avoid forceful exercise** because this may increase paralysis. **Avoid injections.**
- **Good food** during recovery helps the child become stronger. (But take care that the child does not eat too much and get fat. An overweight child will have more problems with walking and other movements.) For suggestions about good food, see *Where There Is No Doctor,* Chapter 11.
- **Position** the child to be comfortable and to avoid contractures. At first the muscles will be painful, and the child will not want to straighten his joints. Slowly and gently try to straighten his arms and legs so that the child lies in as good a position as possible. (See Chapter 8.)

GOOD POSITION



Arms, hips, and legs as straight as possible. Feet supported.

BAD POSITION

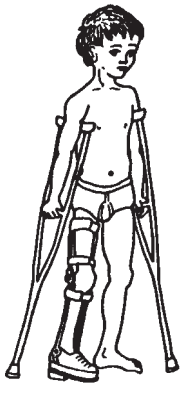


Bent arms, hips, and legs. Feet in tiptoe position.

Note: To reduce pain, you may need to put cushions under the knees, but try to keep the knees as straight as you can.

FOLLOWING THE ORIGINAL ILLNESS:

- Continue with **good food** and **good positions.**
- As soon as the fever drops, start **exercises** to prevent contractures and return strength. **Range-of-motion exercises** are described in Chapter 42. Whenever possible, make exercises fun. **Active games, swimming,** and other **activities to keep limbs moving as much as they can** are important throughout the child's rehabilitation.
- **Crutches, leg braces** *(calipers)*, and other aids may help the child to move better and may prevent contractures or deformities.



- In special cases, **surgery** may be needed to correct contractures, or to change the place where strong muscles attach, so that they help do the work of weak ones. When a foot is very floppy or bends to one side, surgery to join certain bones of the foot may help. But because bone surgery stops the growth of the foot, usually it should not be done before age 12 or 13.
- Encourage the child to **use his body and mind** as much as possible, to play actively with other children, to **take care of his daily needs,** to **help with work,** and to **go to school.** As much as possible, **treat him like any other child.**

REHABILITATION OF THE CHILD WITH PARALYSIS

All children paralyzed by polio can be helped by certain basic rehabilitation measures—such as exercise to keep a full range of motion in the affected limbs.

For this child, walking provides exercise that stretches his legs and feet, and prevents contractures. (Tilonia, India)

However, **each child will have a different combination and severity of paralyzed muscles, and therefore will have his own special needs.**

For some children, normal exercise and play may be all that are needed. Others may require special exercises and playthings. Still others may need braces or other aids to help them move about better, do things more easily, or keep their bodies in healthier, more useful positions. Those who are severely paralyzed may be helped most by a wheelboard (trolley) or wheelchair.

Every child needs to be carefully examined and evaluated in order to best meet his or her particular needs. The earlier you evaluate a child's needs, and take steps to meet them, the better.

Unfortunately, in most areas where polio is still common, village rehabilitation programs do not exist or are just beginning. Many children (and adults) who have been paralyzed for a long time already have severe deformities or joint contractures. Often these must be corrected before a child can use braces or begin to walk.

This child, who had polio as a baby, already had severe contractures in the hips, knees, and feet. (PROJIMO)

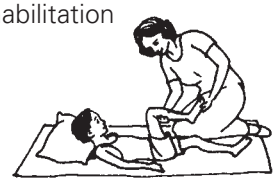
It took several months of exercises at home and then a series of plaster casts in the village rehabilitation center to straighten the contractures so he could walk with braces.

Because contractures are such a common problem, not only with polio but with many other disabilities, we discuss them separately in the next chapter. **Before evaluating a child with polio, we strongly suggest you read Chapter 8 on contractures.**

WARNING: Before deciding on any aid or procedure, carefully consider its advantages and disadvantages. For example, some deformities may be best left uncorrected because they actually help the paralyzed child stand straighter or walk better (see p. 530). And some aids or braces may prevent a child from developing strength to walk without aids (see p. 526). **Before deciding what aid or procedure to use, we suggest you read Chapter 56, "Making Sure Aids and Procedures Do More Good Than Harm."**

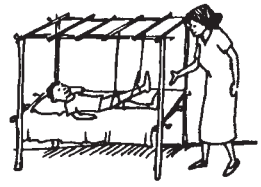
PROGRESS OF A CHILD WITH POLIO: THE CHANGING NEEDS FOR AIDS AND ASSISTANCE

1. **exercises to keep full range of motion,** starting within days after paralysis appears and continuing throughout rehabilitation



2. **supported sitting** in positions that help prevent contractures

3. **active exercises** with limbs supported, to gain strength and maintain full motion

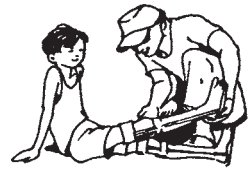


4. **exercise in water—** walking, floating, and swimming, with the weight of the limbs supported by the water

5. **wheelboard or wheelchair** with supports to prevent or correct early contractures

Note: These also provide good arm exercise in preparation for walking with crutches.

6. **braces** to prevent contractures and prepare for walking



7. **parallel bars** for beginning to balance and walk

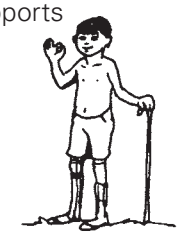
8. **walking machine or 'walker'**

9. **crutches modified as walker** for balance and extra support

10. **under arm crutches**

11. **forearm crutches** and perhaps in time . . .

12. **a cane** or no arm supports at all



Note: These pictures are only an example—but most of the steps are necessary for many children. Children who begin rehabilitation late may also have contractures or deformities requiring corrective steps not shown here.

EVALUATING A CHILD'S NEEDS FOR AIDS AND PROCEDURES

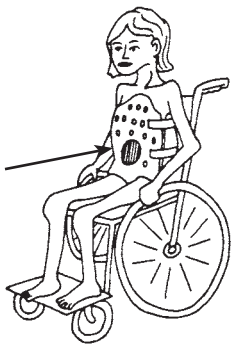
Step 1: Start by learning what you can through talking with the child and family (see Child's History, p. 37 to 38). As you do this, **watch the child move about.** Observe carefully which parts of the body seem strong, and which seem weak. Look for any differences between one side of the body and the other—such as differences in the length or thickness of the legs. Are there any obvious deformities, or joints that do not seem to straighten all the way? If the child walks, what is unusual about the way she does it? Does she dip forward or to one side? Does she help support one leg with her hand? Is one hip lower than the other? Or one shoulder? Does she have a humpback, a swayback, or a sideways curve of the back?

These early observations will help you know what parts of the body you most need to check for strength and range of motion. Often, by watching a child you can begin to get an idea about what kind of aids or assistance may help. For example:

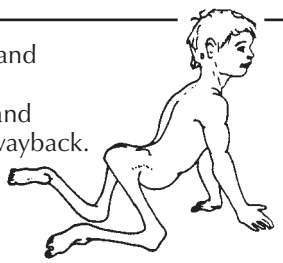
Carmen appears to have severe paralysis affecting both legs and her right arm. Weakness in her trunk (main part of the body) appears to have caused a severe S-shaped curve of the spine.

She will probably never walk, and will need a wheelchair or wheel board.

You may want also to make her a body brace, or help her in other ways to sit more upright and try to keep the spine from bending more.



Pedro appears to have severe paralysis in his legs and hips. It looks as if his hips, knees, and feet cannot straighten (contractures). Weak stomach muscles and severe hip contractures may be the cause of his swayback.

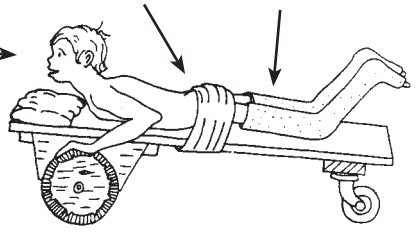


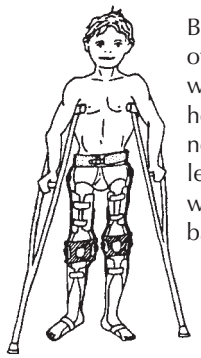
Because his arms look strong, Pedro will probably be able to walk with crutches and leg braces. But first his contractures must be straightened.

If the contractures cannot be straightened by gradual stretching, he may need surgery.

strap to gradually straighten hips.

casts to straighten knees and ankles



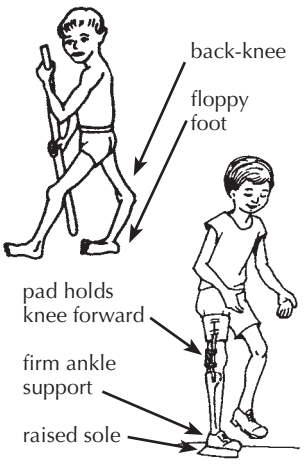


Because of hip weakness, he may need long leg braces with a hip band.

Manuel walks with the help of a stick. He appears to have paralysis mainly in his right leg and foot. Because of weak thigh muscles, he 'locks' his knee backward in order to bear weight on it. This 'back-kneeing' has become more and more extreme as the cords behind the knee stretch. The foot is very unstable and flops to one side. The weaker leg looks somewhat shorter—and for walking is much shorter because of the bent-back knee and bent-over foot.

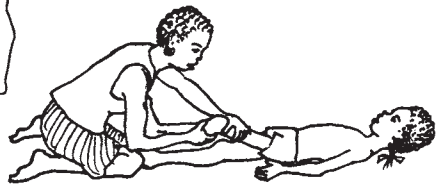
He might be able to walk without the stick if he uses a below-knee brace to stabilize his foot. (See p. 550.)

But the back-knee would become worse and worse until he could not walk. So probably he should have a long-leg brace. The brace might allow his knee to bend backward just a little for stability— so that no knee lock is needed.



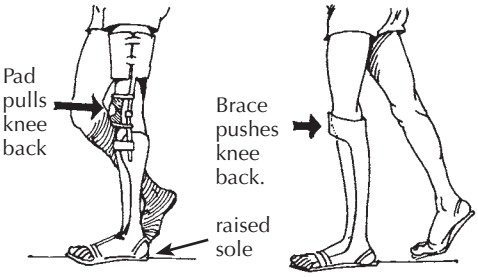
Afia leans forward and pushes her weak left thigh with her hand when she walks. Her left knee cannot quite straighten. Her weak leg looks a little shorter than the other.

Exercises to get her knee straighter or so it can bend very slightly backward may be all that is needed for Afia to walk without using her hand.



Or she may need an above-knee brace with a strap to pull the knee back.

Or she may need only a below-knee brace that helps push her knee back.



The brace bends the foot down just a little, so that by bearing weight on toes (rather than heel) her knee is pushed back.

To get a better idea about which of the three solutions may work best for Afia, you will need to do a careful physical examination, testing range of motion and muscle strength of the hip, knee, and ankle joints.

Step. 2: This is the **physical examination.** It should usually include:

1. **Range-of-motion testing,** especially where you think there might be contractures. (See "Physical Examination," p. 27 to 29, and "Contractures," p. 79 and 80.)

2. **Muscle testing,** especially of muscles that you think may be weak. Also test muscles that need to be strong to make up for weak ones (such as arm and shoulder strength for crutch use). (See p. 27 and p. 30 to 33.)

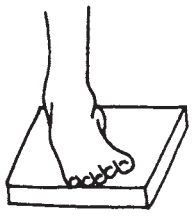
3. **Check for deformities:** contractures; dislocations (hip, knee, foot, shoulder, elbow); difference in leg length; tilt of hips; and curve or abnormal shape of the back. (See p. 34.)

Step 3: After the physical exam, **again observe how the child moves or walks.** Try to **relate her particular way of moving and walking with your physical findings** (such as weakness of certain muscles, contractures, and leg length). (For an example, see p. 70.)

Step 4: Based on your observations and tests, try to **figure out what kind of exercises, aids, or assistance might help the child most.** Consider the advantages of different possibilities: benefit, cost, comfort, appearance, availability of materials, and whether the child is likely to use the aid you make. Ask the child and parents for their opinions and suggestions.

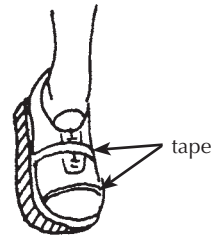
Step 5: Before making a final brace or aid to fit the child, if possible **test to see how well it may work** by using a temporary aid or old brace from another child. For example,

If a child's ankle bends over to the outside like this. . .



. . . a lift on the outer side of the sole like this, may help to keep the foot straighter.

But **before** nailing and glueing in the lift, quickly make a trial one of cardboard or something else and fasten it temporarily to the sandal or shoe with tape or string. Then have the child walk.



Note: For a few children, a lift like this will help. For many it will not.

Ask the child what she thinks.

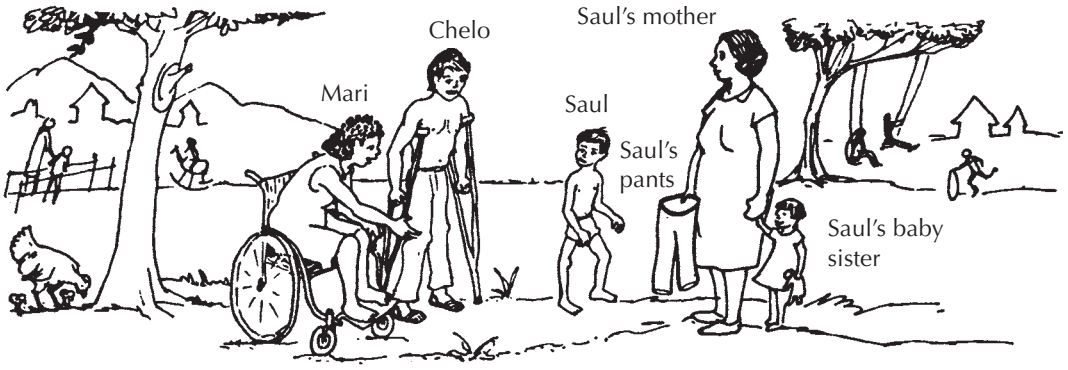
Step 6: After the child, her parents, and you have decided what kind of brace or aid might work best, **take the necessary measurements and make the brace or aid.** When making it, once again it is wise to put it together temporarily so that you can make adjustments before you rivet, glue, or nail it into its final form. (See p. 540.)

Step 7: Have the child **try the brace or aid for a few days** to get used to it and to see how well it works. Ask the child and parents if it seems to help. Does it hurt? Are there any problems? How could it be improved? Is there something that might work better? Make what adjustments are necessary. But remember that no brace or aid is likely to meet the needs of a child perfectly. Do the best you can.

Mari and Chelo making a child's brace

Here is a story of how workers in a small village rehabilitation program figured out what kind of aids a child needed. **How many of the steps we have just discussed did they follow? Was each step important?**

A STORY: A BRACE FOR SAUL

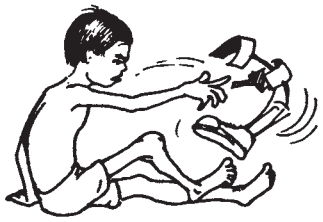


One day a mother from a neighboring village arrived at the village center with her 6-year-old son, Saul. Mari and Chelo, 2 of the village rehabilitation workers, welcomed them warmly. Learning that Saul had polio as a baby, they asked him to walk, and then to run, while they watched carefully. Saul limped a lot and one leg looked thinner and shorter. With each step it bent back at the knee.

"He walks quite well, really," said Mari. "But he has to 'lock' his knee back in order to put weight on it. That knee is going to keep stretching back and some day it will give out."

"A long-leg brace would protect his knee," suggested Chelo.

"Oh, please, no!" said Saul's mother. "A year ago we took Saul to the city and the doctors had a big metal brace made for him. It cost so much we are still in debt! Saul hated it! He would always take it off and hide it. We tried and tried to get him to use it, but he wouldn't."

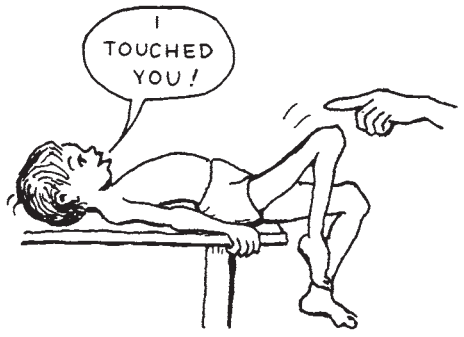


"That's not surprising," said Mari. "Often a child who can walk without a brace will refuse to use one—even if he walks better with it. We could make him a long-leg brace out of plastic. It would be much lighter. What do you say. Saul?" Saul began to cry.

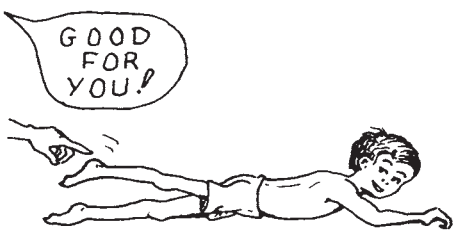
"Don't worry, Saul. Maybe we can do something simpler," said Mari. "But first let's examine you, okay?" Saul nodded.

On muscle testing Saul, they found he could not straighten his knee at all. But he had fair strength for bending his knee back

and his hip forward,

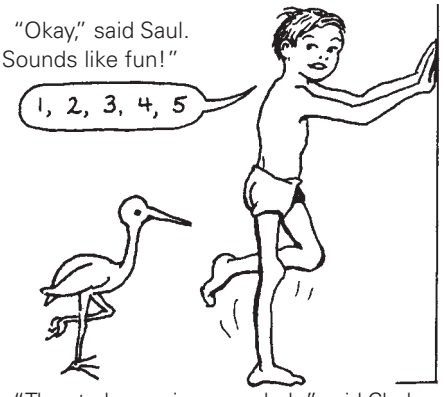


and good strength for bending his hip back.



"With the hip and thigh strength he has, he should almost be able to stand on that leg without the knee bending back," said Mari. "Saul, let's see you try it like this. Pretend you're a stork!" For a moment Saul could do it. "Good!" said Mari. "Every day stand like that and see how high you can count without letting your knee go back. Every day try to beat your old record! Okay?"

"Okay," said Saul. "Sounds like fun!"



"The stork exercises may help," said Chelo. "But I still think he needs a brace. At least at first."

We must weigh the advantages against the disadvantages," said Mari. "A long-leg brace would keep his knee straight. But it could weaken the muscles he needs to strengthen. Since the brace would keep his leg from bending back, he wouldn't have to use his muscles to do it.

A long-leg brace might weaken the muscles Saul needs to strengthen.

"On the other hand, we might try a short-leg brace that holds his foot at almost a right angle. Then, to step flat he will have to keep his knee nearly straight. It could help him strengthen his behind-the-thigh muscles."

"Let's try it!" Everyone agreed, except Saul.

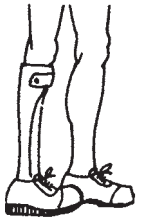
short-leg plastic brace

Chelo brought someone's old, lower-leg plastic brace and showed it to Saul. "See how it will fit right around your leg. It isn't heavy at all. Lift it! And no metal joints to get in the way! What do you say? Do you want to try it?"

"I guess so," said Saul.

When the brace was made, they tested it. Saul said he liked it. At first, when he tried hard, he could walk without bending his knee back. But after a few days, his mother complained that often he would walk, or even stand, with his knee bent way back as before, and his toes in the air, like this.

'WE THOUGHT IT WOULD WORK LIKE THIS . . ."



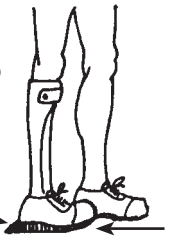
"BUT IN FACT IT WORKED LIKE THIS."

"I have an idea," said Chelo. "Why don't we let the heel stick out behind the shoe. That way, when he steps, his weight will come well forward of the back of his heel. This should help bring his foot down and his knee forward."

They tried it, and most of the time (especially when he was reminded) Saul walked without letting his knee bend back much.

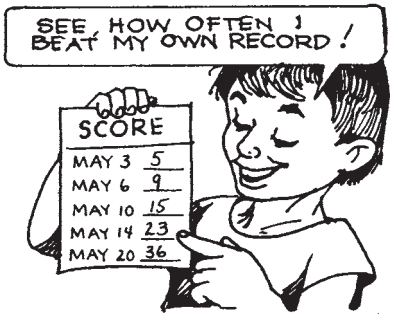
"THIS WORKED BETTER."

Heel extended backward helps prevent back-kneeing.



rounded front of sole to avoid pushing knee back at end of step

At home Saul's mother encouraged him to do his stork exercises. As his muscles grew stronger, he began to walk without bending his knee far back—even in active play!



"WILL MY CHILD EVER BE ABLE TO WALK?"

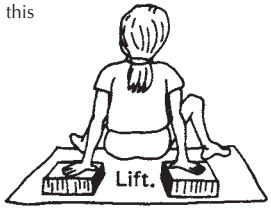
This is often one of the first questions asked by the parents of a disabled child. It is an important question. However, we must help parents realize that other things in life can be more important than walking (see p. 93).

If the child whose legs are severely paralyzed by polio is to walk, generally she will need at least 2 things:

1. **fairly strong shoulders and arms** for crutch use
2. **fairly straight legs** (hips, knees, and feet). (It is important to correct contractures so that the legs are straight or nearly straight before trying to adapt braces for walking.)

To evaluate a child's possibility for walking, always **test arm and shoulder strength:**

Have her try to lift her body weight off the ground with her arms, like this

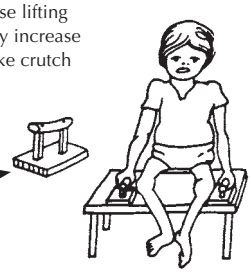


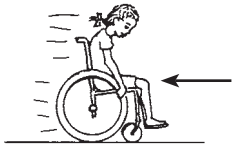
If she can easily lift up and down several limes, she has a GOOD chance of being able to walk using crutches.

If her arms and shoulders are so weak she cannot begin to lift herself, her chances for crutch-walking are POOR.

If her shoulder and arm strength is FAIR, and the child can almost lift herself, daily exercise lifting her weight like this may increase strength enough to make crutch use possible.

Having the child lift herself while holding a bar like this will also help strengthen her hands and wrists for crutch use.





Pushing herself in a wheelchair or wheelboard (trolley) is a practical way to strengthen shoulders, arms, and hands

If the child cannot lift herself because of weak elbows, put simple splints on her arms to see if she can lift herself with these.

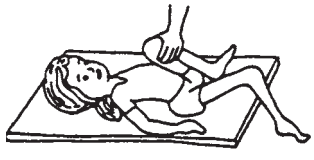
If she can lift herself with the elbow splints, maybe she can use crutches that give elbow support.

If she is fat, she should lose weight. This will make walking on weak limbs much easier.

Now check how straight the legs will go. (See range-of-motion testing, p. 27.)

If the hips, knees, and feet can be placed in fairly straight positions, chances for walking soon with braces are good (if arm strength is good).

But if the child has much contracture of the hips, knees, or feet, these will need to be straightened before she will be able to walk.

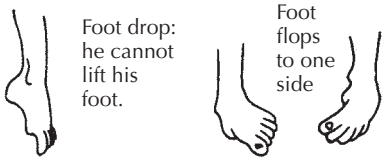


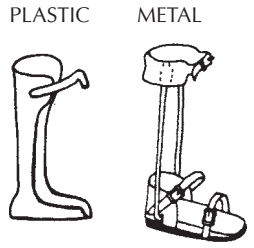
For correction of contractures, see Chapters 8 and 59.

Sometimes, if contractures are severe in one leg only, the child can learn to walk on the other leg only, with crutches. But it is best with both legs, whenever possible.

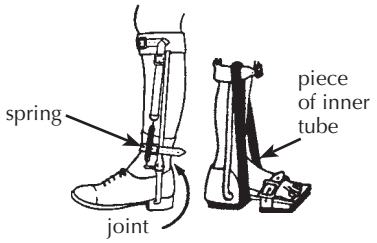
After checking arm strength and leg straightness, the next thing to **check is the strength in the ankles, knees, and hips.** This will help you decide if the child needs braces, and what kind.

A child with a foot that hangs down (foot drop), **or flops to one side** may be helped by a below-knee brace of plastic or metal.



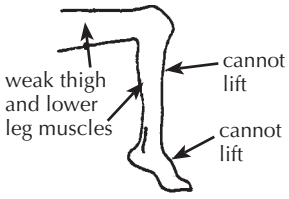


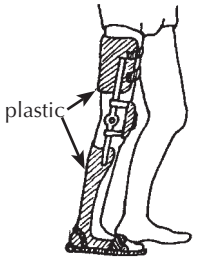
For foot drop, you can make a brace that lifts the foot with a spring or rubber band. (See p. 545.)

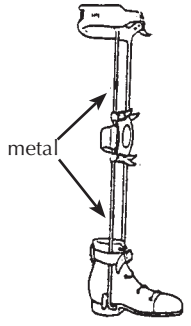


The kind of brace you choose will depend on various factors, including cost, available skills and materials, and what seems to work best for the particular child. **Advantages and disadvantages of different kinds of braces, and how to make them, are discussed in Chapter 58.**

A child with a weak knee may need a long-leg brace of plastic or metal.

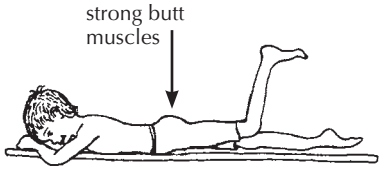


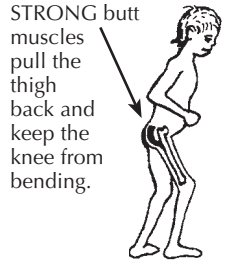




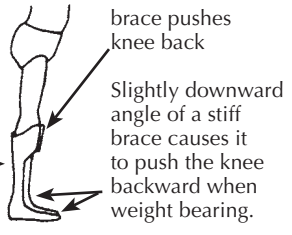
Upper-leg braces may be made with or without a knee joint that locks straight for walking and bends for sitting. Different models are discussed in Chapter 58.

Note: Not all children with no strength to straighten the knee need long-leg braces: A child with strong butt muscles may be able to walk without a brace.

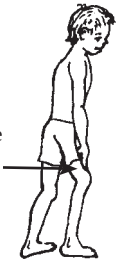




A child who has FAIR butt strength and a straight knee may be helped enough by a lower-leg brace that pushes the knee back.



A child with weak butt muscles may walk with one hand pushing on the weak thigh.

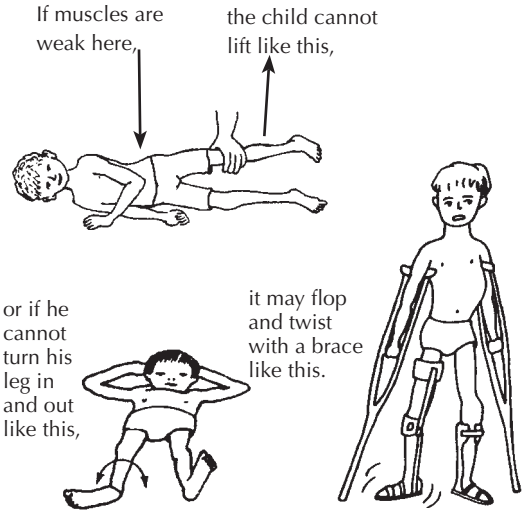


Or he may walk by bending the knee back to 'lock' it for weight bearing.

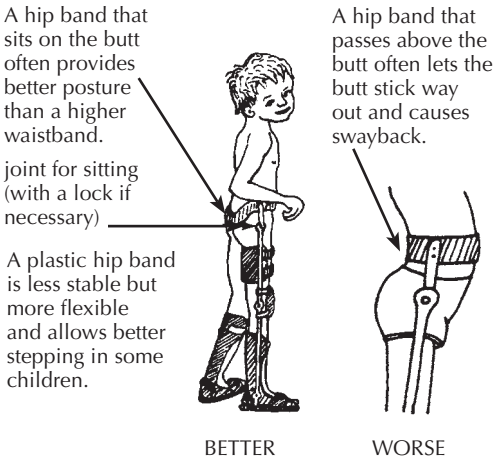
CAUTION: A stiff foot with a moderate tiptoe contracture may help push the knee back, just like a stiff brace. Correcting the contracture may make walking more difficult or impossible, so that a brace is needed where none was needed before. (See Chapter 56.)

If a child has a contracture and cannot walk with his knee straight, correcting the contracture until his knee bends very slightly backward may allow him to walk better.

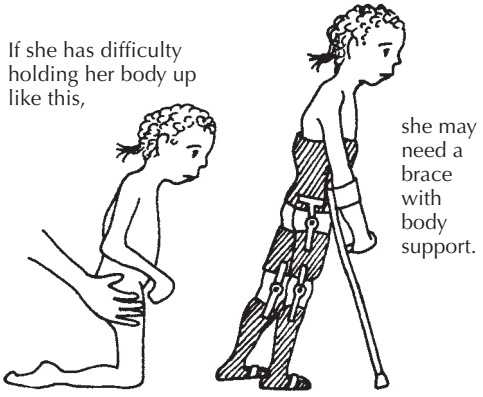
A child with very weak hip muscles may find his leg flops or twists about too much with a long-leg brace.



He may need a brace with a hip band to help stabilize the leg at the hip.



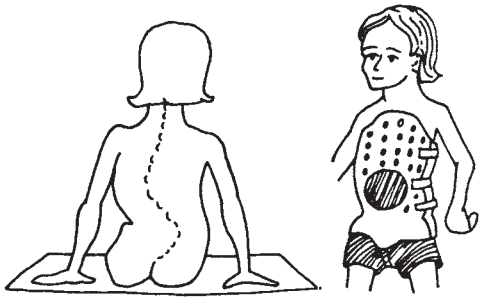
A child with weak body and back muscles, who cannot hold up her body well, may need long-leg braces attached to a body brace or body jacket.



Note: Often a child at first may need a hip band or body jacket to help stabilize her for walking. A few weeks or months later she may no longer need it. Removing it may help the child gain more strength and control. It is **important to re-evaluate the child's needs for bracing periodically.**

Take care to use no more bracing than is needed.

A child whose backbone is becoming seriously curved may benefit from a body brace (or in severe cases, she may need surgery).



If necessary, the body brace can be attached to long-leg braces as shown above.

More information on spinal curve can be found in Chapter 20. For information on how to make body braces and jackets, see Chapter 58.

PREVENTION OF POLIO

- **Vaccinate** babies with polio vaccine. It is usually best to give the first polio vaccination at birth Often they get the vaccine at the same time as the DPT vaccine, 4 times by the time they are 18 months old. They should get a 5th dose when they are 4 to 6 years old.

- **Vaccinate as many children as possible.** The vaccine given by mouth is alive. So, if most of the children are vaccinated, the live vaccine will spread to children who have not been vaccinated, and protect them also.

- **Try to keep the polio vaccine very cold** (2° to 8°C). It must be kept cold or it will spoil.

- **Seek community help** with vaccination and in keeping vaccines cold. Sometimes vaccines do not reach villages because health posts lack refrigeration. But often storekeepers and a few families have refrigerators. Win their interest and cooperation.

- To give best protection, **vaccinate the child when she does not have a fever over 38°C or diarrhea.** But if she is just a little sick it is OK to give the polio vaccine. It is more important to give the complete series of 3 vaccinations and one booster later, than to miss them because the child is sick.

It is estimated that in poor countries **at least one-third of vaccines are spoiled by the time they reach the children.** Therefore, **even in children who have been vaccinated, additional precautions are needed:**

- **Breastfeed** your baby as long as possible. Breast milk contains 'antibodies' that may help protect against polio. (Babies rarely get polio before 8 months old because they still have their mothers' antibodies. Breastfeeding may make this protection last longer.)

BREAST MILK PROTECTS AGAINST INFECTIONS– INCLUDING POLIO

- **Organize the people** and help out in popular campaigns to encourage vaccination and breastfeeding. **Community theater and puppet shows** are good ways to raise awareness on these issues. See Chapter 48.

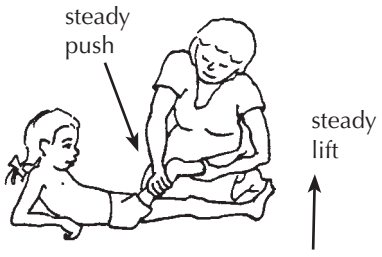
PREVENTION OF SECONDARY PROBLEMS

We have already discussed some ways to prevent new problems or complications in a child with paralysis. In summary, important measures include:

- **Prevent contractures and deformities.** Begin appropriate **range-of-motion** exercises as soon as the paralysis appears.
- At the first sign of a joint contracture, do **stretching exercises** 2 or 3 times a day—every day.

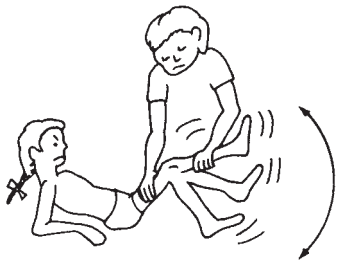
Stretching exercises work better if you stretch the joint firmly and continuously for a few moments,

CORRECT



instead of 'pumping' the limb back and forth.

WRONG



We emphasize this point because in many countries parents are taught the pumping method—which does very little good.

For more details, see "Contractures," Chapter 8.

- **Evaluate the child's needs regularly,** and **change or adapt aids, braces, and exercises to meet her changing needs.** Too little or too much bracing can hold the child back or create new problems.
- **Be sure crutches do not press hard under the arms;** this can cause paralysis of the hands (see p. 393).

- **Try not to let the child's physical disability hold back her overall physical, mental, and social development.** Provide opportunities for her to lead an active life and take part in games, activities, school, and work with other children. PART 2 of this book discusses ways to help the community meet the needs of disabled children.

OTHER PARTS OF THIS BOOK THAT MAY BE USEFUL IN MEETING NEEDS OF A CHILD AFFECTED BY POLIO
Especially important chapters are marked with a star:

Physical examination, Chapter 4

Measurement of contractures and progress, Chapter 5

*Contractures, Chapter 8

Dislocated hips, Chapter 18

Spinal curve, Chapter 20

*Range-of-motion and other exercises, Chapter 42

Crutch use, wheelchair transfers, etc., Chapter 43

Community needs, social adjustment, growing up, PART 2, especially Chapters 47, 48, 52, 53

Making sure aids and procedures meet the child's needs, Chapter 56

*Braces and calipers, Chapter 58

*Correcting contractures, Chapter 59

Correcting club feet, Chapter 60

Special seating and wheelchairs, Chapters 64, 65, 66

*Aids for walking, Chapter 63

For more information on polio, see References p. 637.

A BOY WITH POLIO BECOMES AN OUTSTANDING HEALTH AND REHABILITATION WORKER

Marcelo Acevedo was disabled by polio. He and his family lived in a village 2 days from the closest road. Village health workers from Project Piaxtla helped Marcelo get surgery for his knee contractures. After surgery he got braces and went to school. Then they trained him as a village health worker, and he returned to serve his village.

Marcelo at age 4, sitting with his older brother who was temporarily disabled when a tree fell on his leg.

Marcelo training at Project Piaxtla.

When PROJIMO was formed, Marcelo joined as a village rehabilitation worker. He studied brace-making as an apprentice in 2 brace shops in Mexico City.

Marcelo making a plastic leg brace.

Marcelo and other villagers make a plaster body mold of a young boy's chest. The child had polio and has a severe curve of the spine.

With his plastic body brace, made by Marcelo, the child can sit much straighter. (See p. 558.)

Marcelo is now one of the leaders in PROJIMO, and has gained the respect of the whole village. He has recently married a village woman.