HANDICAP INTERNATIONAL

Training manual for mid-level therapists

Part 4
Pathologies and physical therapy treatments

Hemiplegia

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HEMIPLEGIA is loss of controlled movement and decreased feeling in one side of the body.

OBJECTIVES

At the time of the exam and with 80% proficiency, the student will be able to correctly:

1. describe hemiplegia (causes and symptoms).

2. identify the 3 different stages of hemiplegia and what happens in each stage.

3. describe flaccidity and spasticity.

4. evaluate a hemiplegic patient and identify problems that Physical Therapy can help.

5. demonstrate the appropriate Physical Therapy treatment for hemiplegic patients in different stages of recovery.

CHAPTER CONTENTS

A. INTRODUCTION

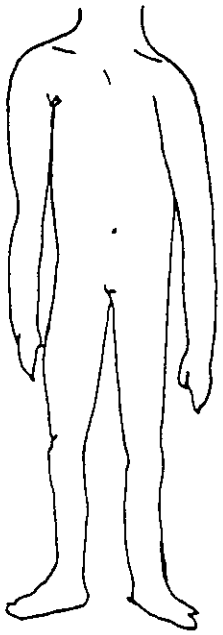
Hemiplegia is a problem of the central nervous system. The PTA should study the nervous system (see NEUROLOGY chapter, Volume 1) before beginning this chapter.

B. WHAT IS HEMIPLEGIA

Hemiplegia is loss of controlled movement and decreased feeling in ONE SIDE of the body. Hemi = half

Loss of movement can mean:

NO MOVEMENT
(flaccid paralysis)
Flaccidity



UNWANTED/EXTRA MOVEMENT
(spastic paralysis)
Spasticity

Questions:

1. A patient has no movement in the right arm. All other body parts are normal. Does this patient have complete hemiplegia?

   Yes _____ No _____

2. A patient has spasticity in both legs. What does spasticity mean?

   _____

   _____

3. A patient has a flaccid left arm and a flaccid left leg. What does flaccid mean?

   _____

   _____

   Could this patient have hemiplegia?

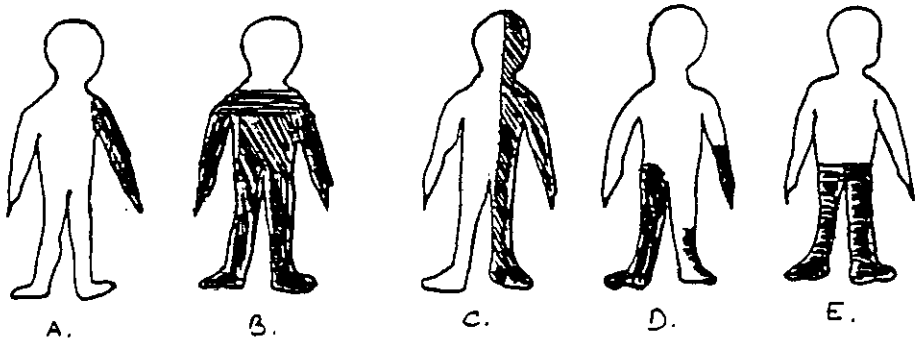
   Yes _____ No _____

4. A patient has paralysis in the right side of the body. Describe 3 general problems this patient will have in a normal day.

   _____

   _____

5. Below are pictures of different patients. The dark areas are the areas that have uncontrolled movement. Please identify what pictures could be patients with hemiplegia.



C. CAUSE OF HEMIPLEGIA

The cause of hemiplegia is <u>damage to one side of the brain</u>.

Brain damage can be caused by:

TRAUMA

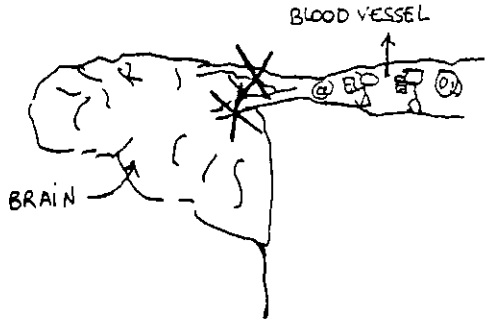
* direct hit to the head.

DECREASED CIRCULATION

* Blood travel is blocked. Food and oxygen cannot arrive at a part of the brain and it becomes weak and dies.

DISEASE

* Disease may attack one area of the brain more than another area.



<u>Questions</u>:

1. If there is damage on the right side of the brain, what side of the body will have a problem?

   _____

2. A patient has <u>right</u> hemiplegia. What side of the body has abnormal movement and feeling?

   _____

   What side of the brain has been damaged?

   _____

D. SPECIFIC INFORMATION ABOUT HEMIPLEGIA

Information provided in this section includes:

1. The stages of hemiplegia (descriptions and explanations are given for each stage).
2. Different problems of hemiplegic patients.

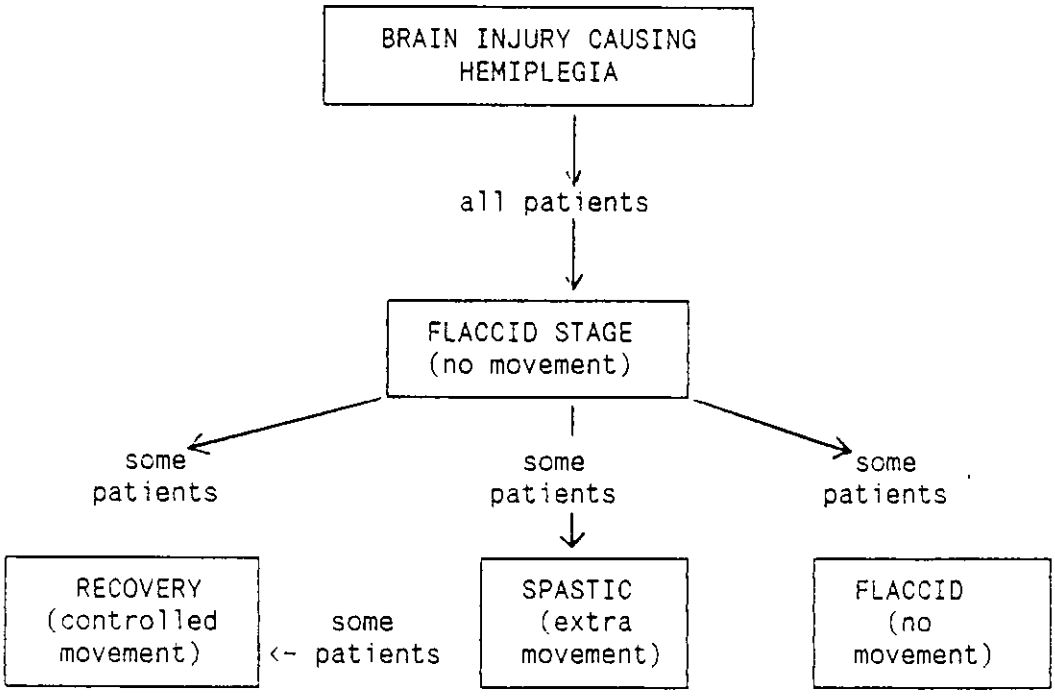
1. THE STAGES OF HEMIPLEGIA

There are 3 stages of hemiplegia:

a. FLACCID STAGE (NO MOVEMENT)

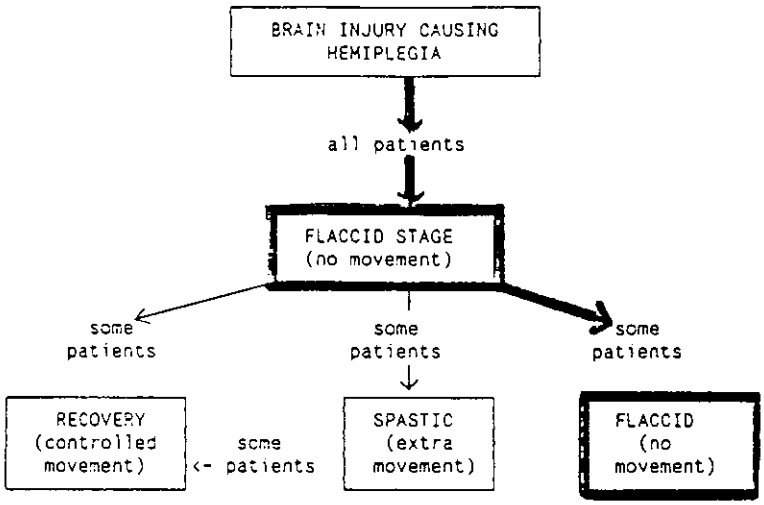
b. SPASTIC STAGE (UNCONTROLLED, EXTRA MOVEMENTS)

c. RECOVERY STAGE (REGAIN CONTROLLED MOVEMENT)



For each stage we will give a description of what you may see and an explanation of why this may happen.

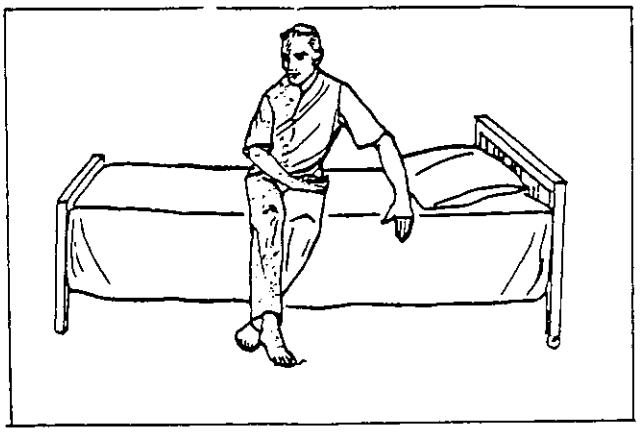
a. FLACCID STAGE (NO MOVEMENT)



Description of Flaccid Stage

Just after damage to the brain, muscles on one side of the body will make no movement.

This can include muscles of the face, tongue, trunk, upper limb and lower limb.



Another word used to describe flaccid is "floppy".

A part that is flaccid (floppy) feels very heavy and loose.

Some patients will describe a flaccid limb as a "dead" limb. The limb is not dead, but it has no muscle movement to show that it is alive.

Flaccid stage can continue for some days, weeks or months. In some patients (not often), a part may remain flaccid forever.

Explanation of why flaccid stage happens

Normally the brain is very active.

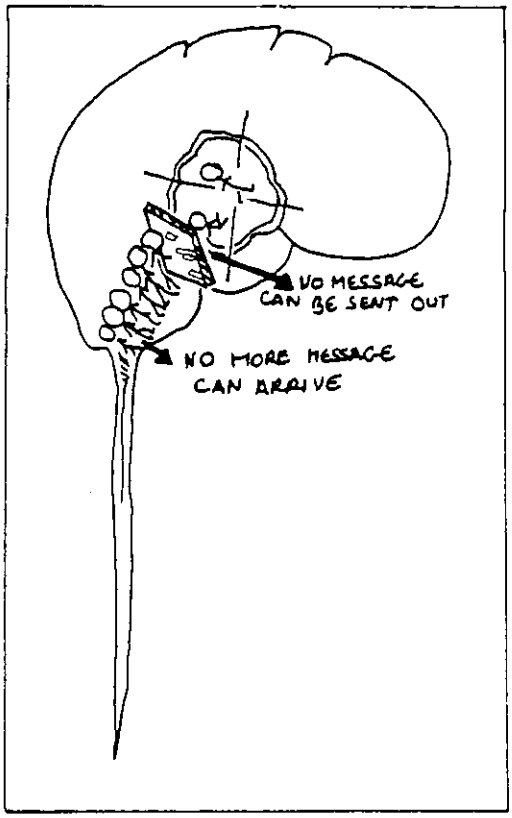
The brain makes messages, sends messages and receives messages.

If there is damage to a part of the bain, this area will stop working.

This damaged area cannot make messages for a part of the body.

This damaged area cannot send messages to a part of the body.

This damaged area cannot receive messages from a part of the body.



THIS IS THE FLACCID STAGE.

Questions:

1. After brain injury, the part of the brain that is damaged cannot make or send messages to a part of the body. What will this part have problems with, movement or feeling?

   _____

   Explain your answer.

_____

_____

_____

_____

2. In your own words, describe why hemiplegic patients in flaccid stage may also have problems with sensation (feeling) in the flaccid limb.

_____

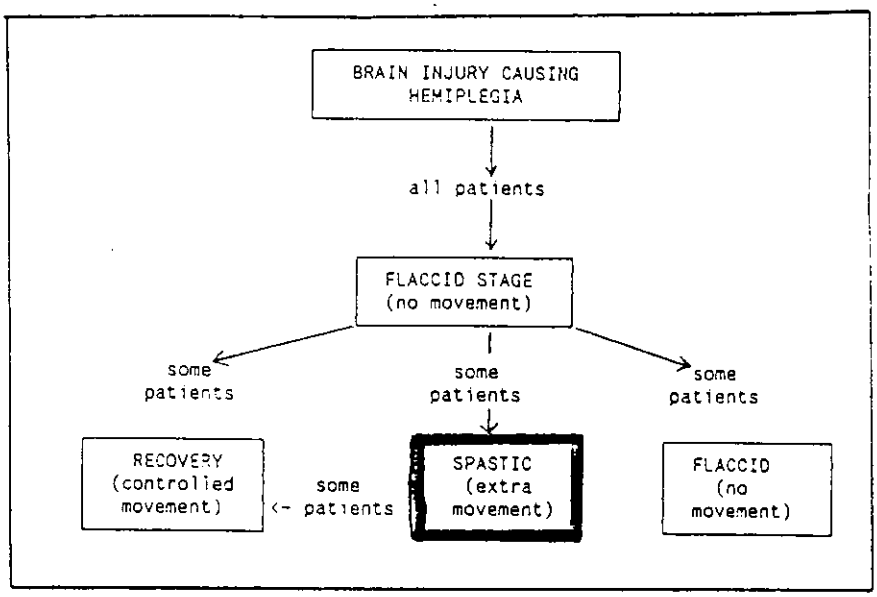
_____

_____

_____

_____

b. SPASTIC STAGE (UNCONTROLLED, EXTRA MOVEMENT)



Description of Spastic Stage

After flaccid stage, some patients may begin to have uncontrolled movement in the arm and leg. Uncontrolled, extra movement is called Spasticity.

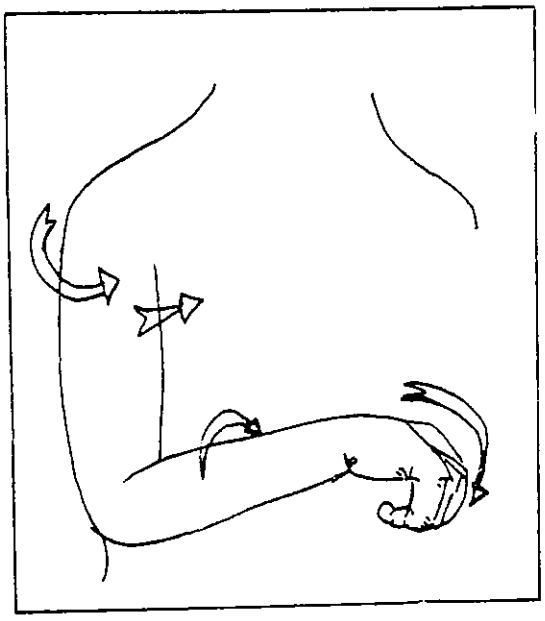
Spasticity in hemiplegia is seen in many muscles at the same time. This is called "group spasticity".

Group spasticity means that the uncontrolled movement of the upper limb or lower limb do not happen to only one muscle; spasticity is seen in many muscles at the same time.

In hemiplegic patients, "group spasticity" generally appears in the stronger muscles of the upper and lower limb.

Common "group spasticity" in the upper limb is:

shoulder:	adduction, internal rotation
elbow:	flexion
forearm:	pronation
wrist:	flexion
fingers:	flexion, adduction
thumb:	flexion, adduction

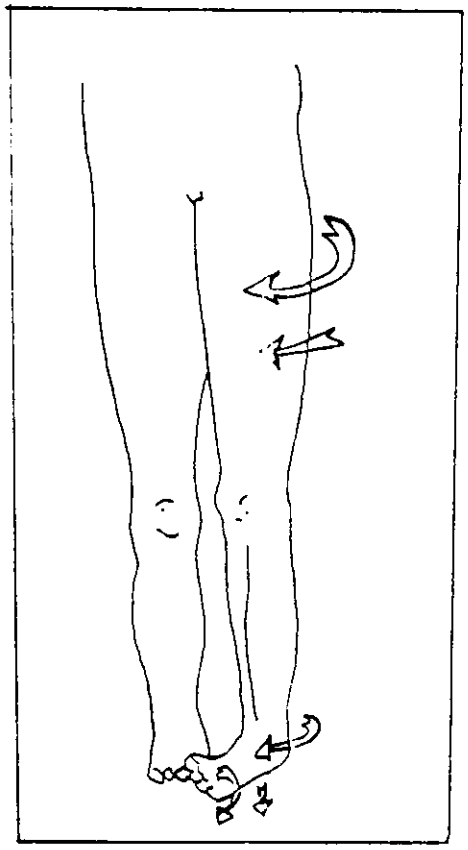


NOTE:

Not all patients will look this.
Some patients may have diferrent muscles
included in "group spasticity".

Common "group spasticity" in the lower limb is:

hip:	extension, internal rotation, adduction
knee:	extension
ankle:	plantarflexion
foot:	inversion
toes	flexion, adduction

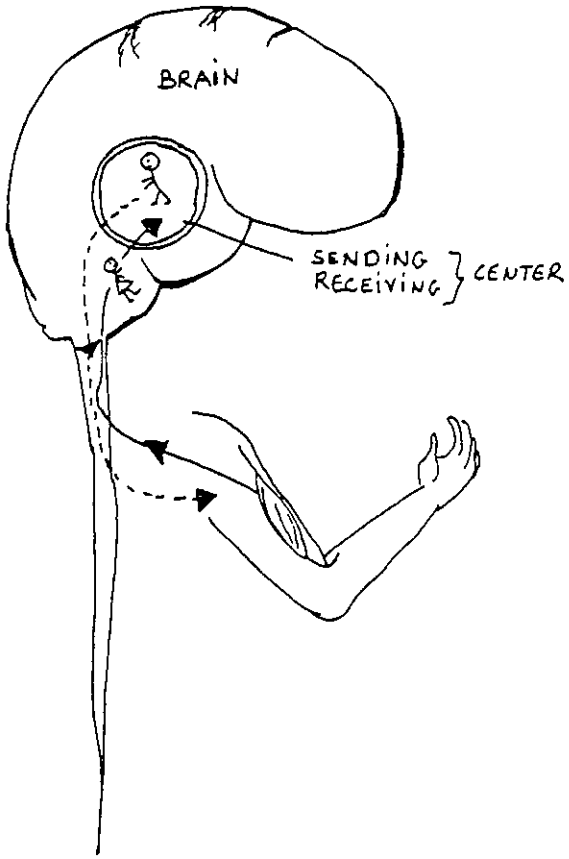


NOTE:

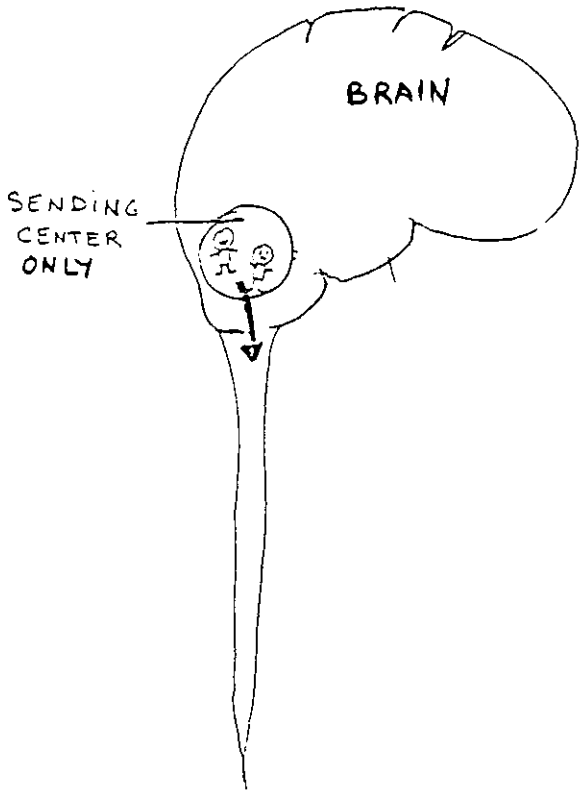
Not all patients will look this.
Some patients may have diferrent muscles
included in "group spasticity".

Explanation of why flaccid stage happens

We have said that the brain can make, send, and receive messages to and from all parts of the body.



There is a special part of the brain (special sending area) that would like only to send messages to the muscles all of the time to tell them to work.

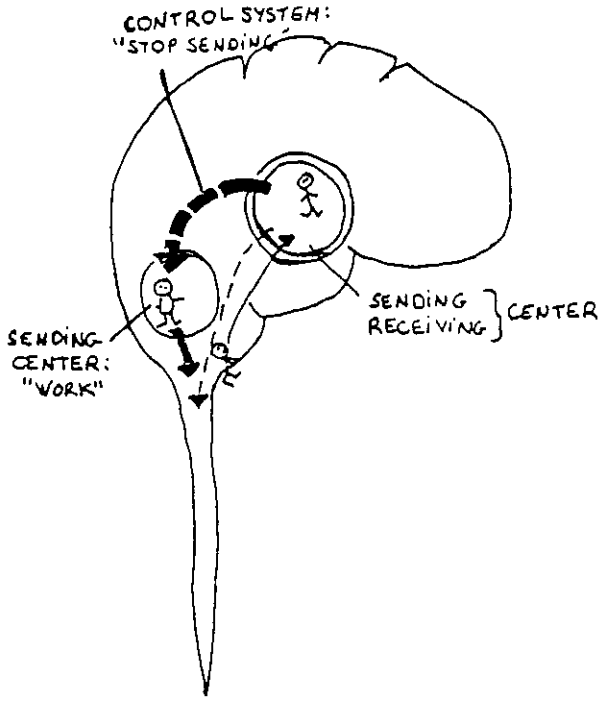


Question:

If this special part of the brain was free to send messages all of the time, would ALL MUSCLE ACTIVITY be increased or decreased?

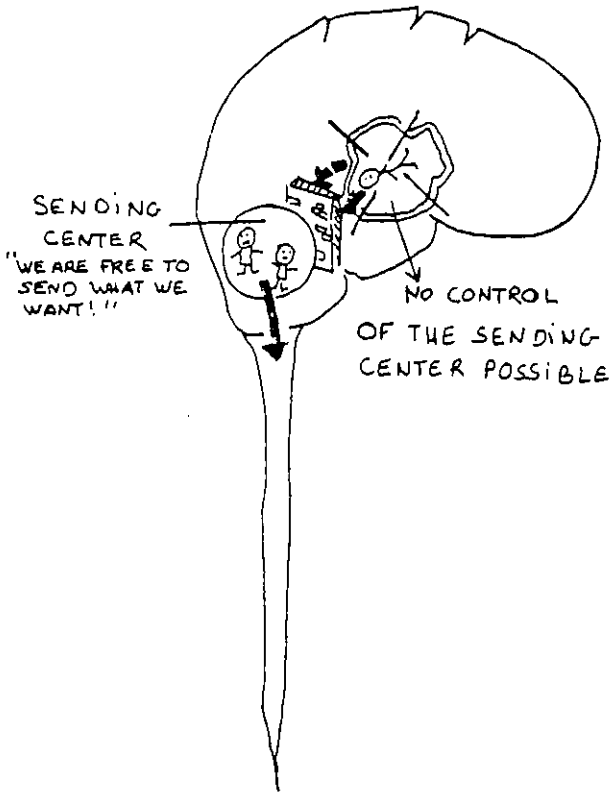
Explain your answer.

To help CONTROL muscle activity, a part of the brain must INHIBIT (stop) many of these messages.



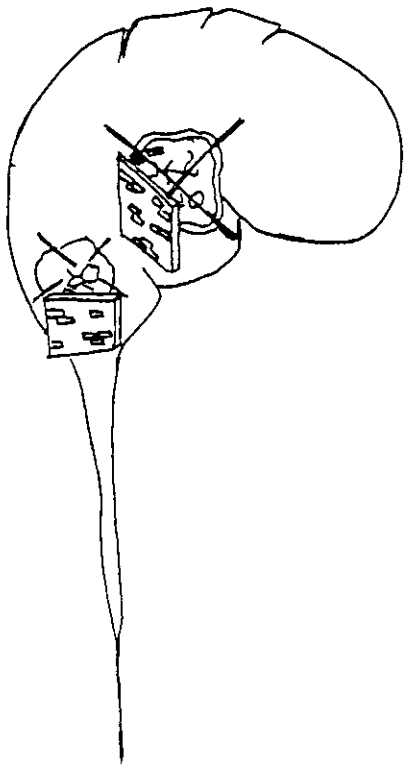
Question:

If a part of the brain inhibits these messages there is more controlled muscle movement. Explain why.



When the damaged part of the brain is the "inhibiting part", the inhibiting part stops working.

The "special sending area" is free to send many messages and the result is uncontrolled movement (spasticity) in specific muscles.



If brain damage is so severe that the "inhibiting part" and the "special sending area: are both damaged, then the patient will remain FLACCID.

Questions:

1. A patient has right hemiplegia.

   * What side of the body has a problem with feeling?

   _____

   * What side of the brain has been damaged?

   _____

2. After 2 weeks, the patient in Question 1 begins to have spasticity (uncontrolled movement) in the right arm. Explain why this happens.

_____

_____

_____

_____

3. Do you expect the patient in Question 1 to develop spasticity in the left arm?

   Yes _____ No _____

   Why or why not?

_____

_____

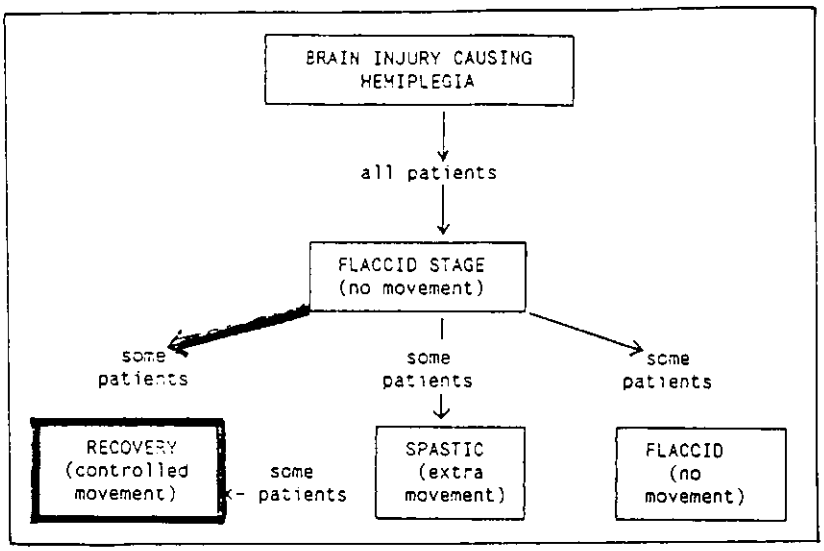
_____

_____

4. The patient in Question 1 also has a FLACCID lower limb. Is this flaccidity on the left side or the right side?

   _____

c. RECOVERY STAGE (REGAIN CONTROLLED MOVEMENT)



Description of Recovery Stage

The patient has relearned how to make individual movements, and the brain has been retrained on how to control different movements.

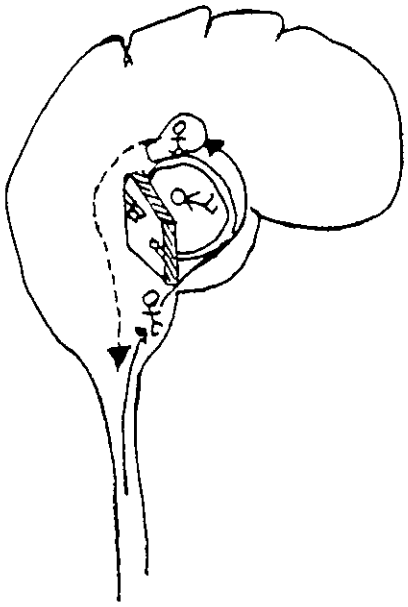
In some patients where brain damage is severe, individual movements of some body parts may never be possible (flaccidity or spasticity may remain forever).

Most recovery happens in the first six months after brain injury. Some recovery may continue even after many years, but this is not common.

Explanation of why Recovery Stage happens

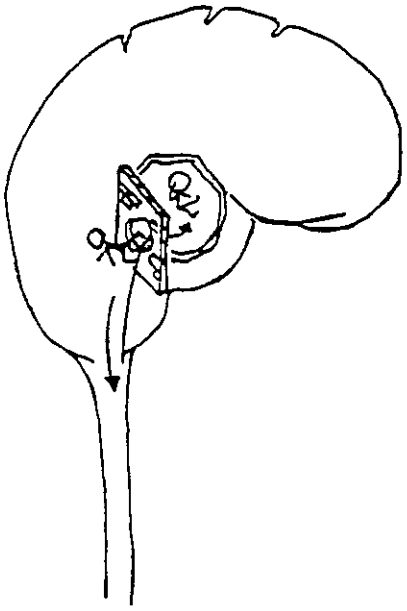
Areas of the brain that have died (been completely destroyed) will not recover.

There are three ideas that help explain how a patient may be able to recover individual movements after an injury to the brain.



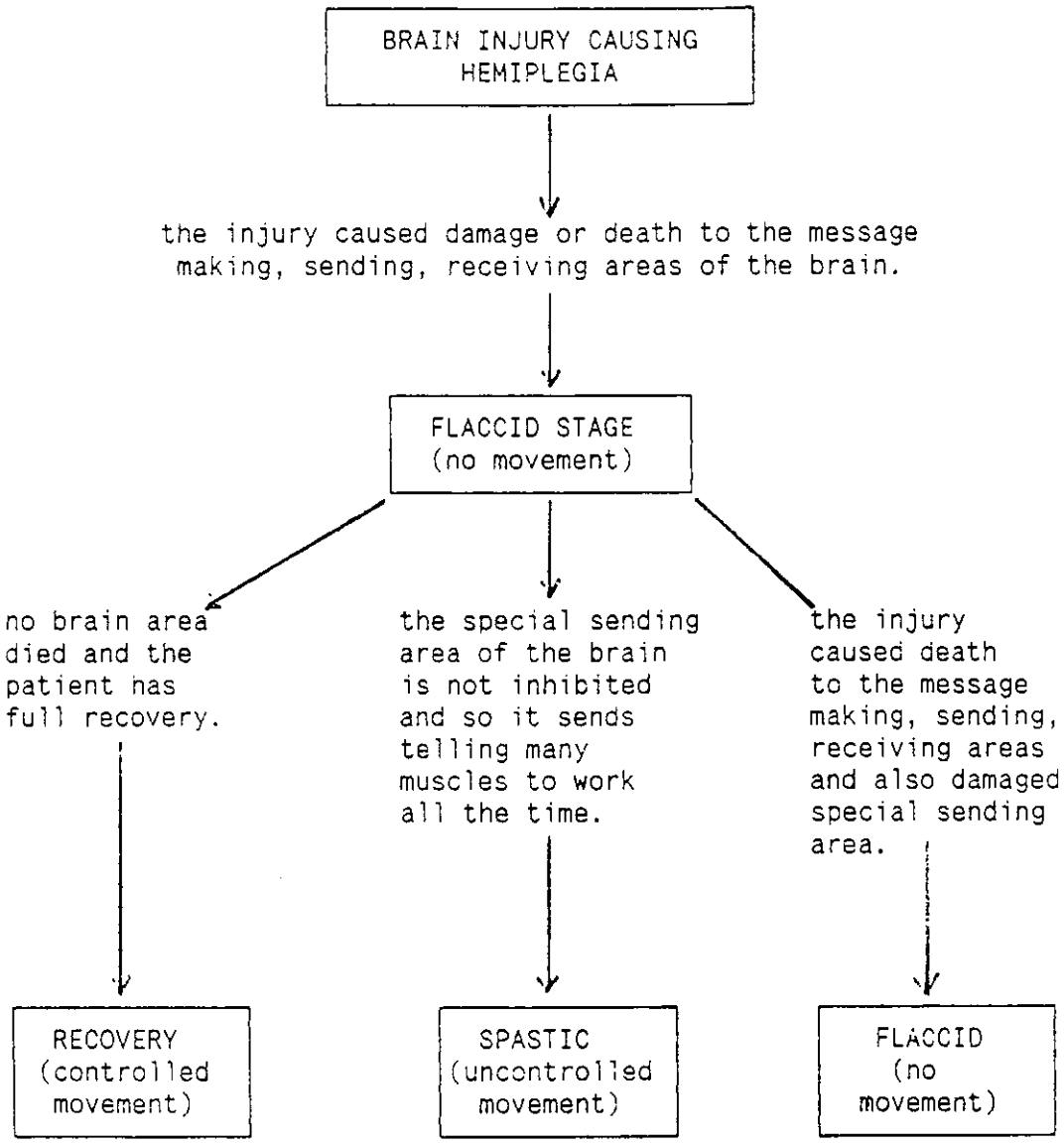
i) areas that are <u>close</u> to the brain-dead area may try to help and do some of the work that this area would normally do.

ii) Some areas that had only small injury (or pressure from swelling) and did not die may recover to normal function.



iii) Through <u>practice</u> and <u>retraining</u> the patient may be able to <u>control</u> some of the "group spasticity" muscles.

SUMMARY OF THE 3 STAGES OF HEMIPLEGIA



an injured part recovers, or areas close to the brain-dead areas help with the work, or the patient relearns how to make individual movement through lots of practice.

Notes:

- The length of time for each stage is different in all patients
  Example: flaccid stage may be 1 week in one patient and may be 3 weeks in another patient

- A clear beginning and end of the stages cannot be seen; often many of the stages can be seen at the same time
  Example: a man may have controlled movement in the right hip, spasticity in the right foot, and flaccidity in the right arm.

- Not all patients will have controlled movements. Many hemiplegic patients may continue to have some spasticity for the rest of their lives.

2. DIFFERENT PROBLEMS OF HEMIPLEGIC PATIENTS

As we have said before, hemiplegic patients will have problems with movement and feeling on one side of the body.

This may include movement and feeling in the face, mouth, tongue, trunk and limbs on that side.

Activity:

You have just met a patient with left hemiplegia. There is no movement in the muscles of the left face, mouth, tongue, trunk, arm and leg.
Describe five problems that this patient will have in a normal day.

_____

_____

_____

_____

_____

In addition to problems with movement and feeling, the hemiplegic patient may also have problems with

* speaking
* "knowing" one side of the body
* following directions
* controlling emotions

* SPEAKING

The language area (the area that gives you the ability to speak) is on the LEFT side of the brain only.

If the language area is damaged, the patient will be able to understand what you say, but is <u>not able to speak</u>.

Questions:

1. What type of hemiplegic patient will have a problem with speaking (right hemiplegic or left hemiplegic)?

_____

Questions: (continued)

2. A patient with hemiplegia cannot speak. The PTA stops speaking to the patient and uses hand movements to communicate with the patient.
   Is this a good idea? Yes _____ No _____

   Explain your answer.

   _____

   _____

   _____

* "KNOWING" ONE SIDE OF THE BODY

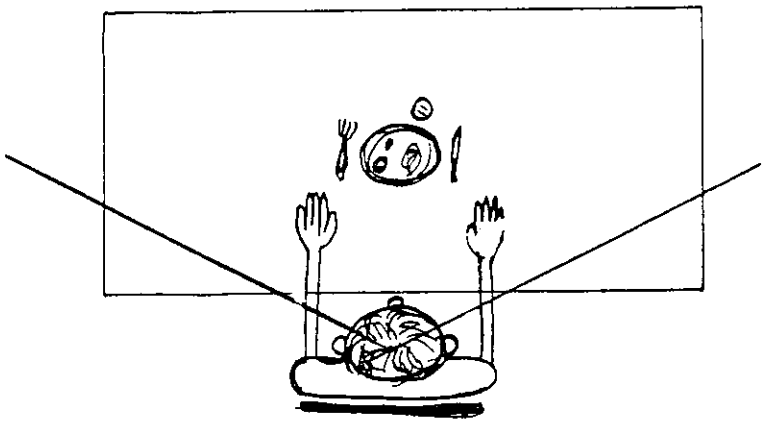
The patient with hemiplegia may not remember, recognize, know or see the hemiplegic side of their body.

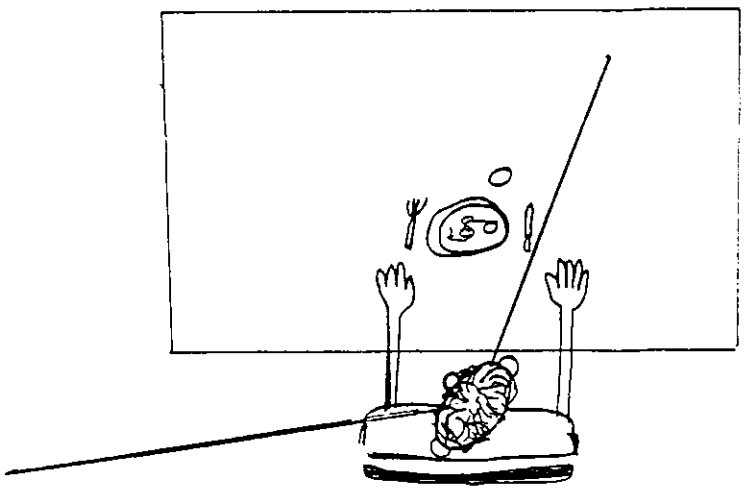
The brain is not making or sending messages to this area and is not able to receive messages from this area.

With no messages arriving to and from the hemiplegic side, the patient can easily "forget" that this side continues to be a part of his body.

For some patients, the brain may be damaged in such a way that the patient does not "see" the area or objects on the hemiplegic side.

Example:





* FOLLOWING DIRECTIONS

In some patients, the brain has been damaged so that it may be difficult for the patient to follow directions or understand simple conversation.

* CONTROLLING EMOTIONS

After the brain has been damaged, the patient may become very sensitive and may easily be angry, cry, laugh or shout.

The PTA must remember that these behaviors may be difficult for the hemiplegic patient to control.

IN SUMMARY

The different problems of a hemiplegic patient are caused by damage to or death of a specific part of the brain.

Our body is one complete whole. When a part of it is damaged, the "normal" areas cannot remain the same. These areas may need to do more work, adapt their work, or help to retrain the damaged areas.

It is important to remember that a hemiplegic patient is not just a paralyzed arm and leg.

There may be many other problems caused from damage to the brain and we must always work with the whole patient.

E. MEDICAL TREATMENT OF HEMIPLEGIA

Medical treatment for hemiplegia is medicine given to:

* make the blood thinner: this will prevent the blood from being blocked in the arteries and veins

* try to decrease pain (if the patient complains of pain)

* try to decrease spasticity (this medicine will also make the patient very sleepy)

In general, MEDICINE WILL NOT HELP THE PATIENT RECOVER CONTROLLED MOVEMENT.

Controlled movement can happen only with practice and retraining muscles on the hemiplegic side of the body.

It is the responsibility of the PTA to work closely with the patient to help retrain muscles and practice controlled movements.

F. PHYSICAL THERAPY EVALUATION OF PATIENTS WITH HEMIPLEGIA

The PTA must carefully evaluate the patient to identify changes in movement and function.

FLACCID PERIOD

* sensation (what areas have decreased feeling or no feeling?)
* what areas are completely flaccid (do some areas have a little muscle tone?)
* pain
* range of motion
* functional ability of patient (moving in bed, sitting, eating)
* mentation (can the patient follow directions or understand you?)
* awareness of the hemiplegic side of the body

SPASTIC PERIOD

* sensation
* pain
* range of motion
* group spasticity (where, how strong, when do you see it?)
* flaccid areas
* functional ability of the patient (moving in bed, sitting, transfers, standing)
* mentation, and awareness of hemiplegic side of the body

RECOVERY PERIOD

* sensation, pain, range of motion
* amount of controlled movement that the patient has (movements that are not in a group pattern)
* group spasticity areas
* functional ability of the patient (standing, walking, dressing)
* flaccid areas
* equipment needed to help patient be more functional and independent in every day activities

F. PHYSICAL THERAPY TREATMENT OF PATIENTS WITH HEMIPLEGIA

RULES TO REMEMBER IN TREATING ALL HEMIPLEGIC PATIENTS

* Weakness is NOT the main problem, NO CONTROL of movement is the main problem.
* The PTA should NOT muscle test a patient with hemiplegia and NOT work to "strengthen" the hemiplegic side. The patient must learn to control individual movements.
* The whole person needs treatment to help both sides of the body to work together again.

Specific Physical Therapy treatments will be discussed for each stage of hemiplegia.

1. PHYSICAL THERAPY TREATMENT IN FLACCID STAGE
2. PHYSICAL THERAPY TREATMENT IN SPASTIC STAGE
3. PHYSICAL THERAPY TREATMET IN RECOVERY STAGE

1. PHYSICAL THERAPY TREATMENT IN FLACCID STAGE

Physical Therapy treatment should begin as soon as possible after a patient has hemiplegia.

Physical Therapy treatment during this stage includes:

a. good patient positioning

b. orient the patient to the hemiplegic side of the body

c. psychological support

d. maintain ROM

e. practice functional movements

f. balance exercises

g. stimulate movements not expected in group spasticity

h. provide wheelchair

a. good patient positioning

Good positioning for the hemiplegic patient in flaccid stage is important to help:

* keep the joints in a good position
* avoid spasticity
* support the joints that flaccid muscles cannot support
* encourage the patient to look on the hemiplegic side

In this section will will describe:

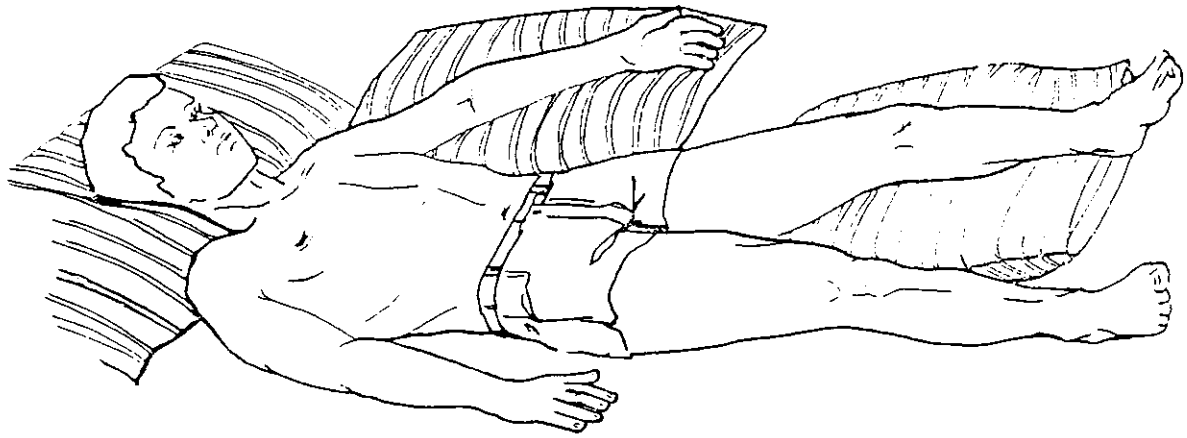
i) suggested bed positions

ii) suggested sitting positions (wheelchair, table, bed)

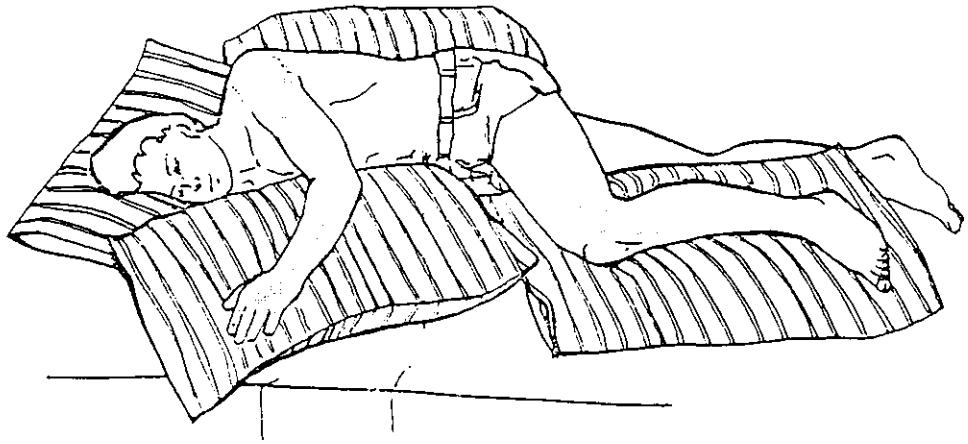
iii) equipment to help with positioning

i) suggested bed positions

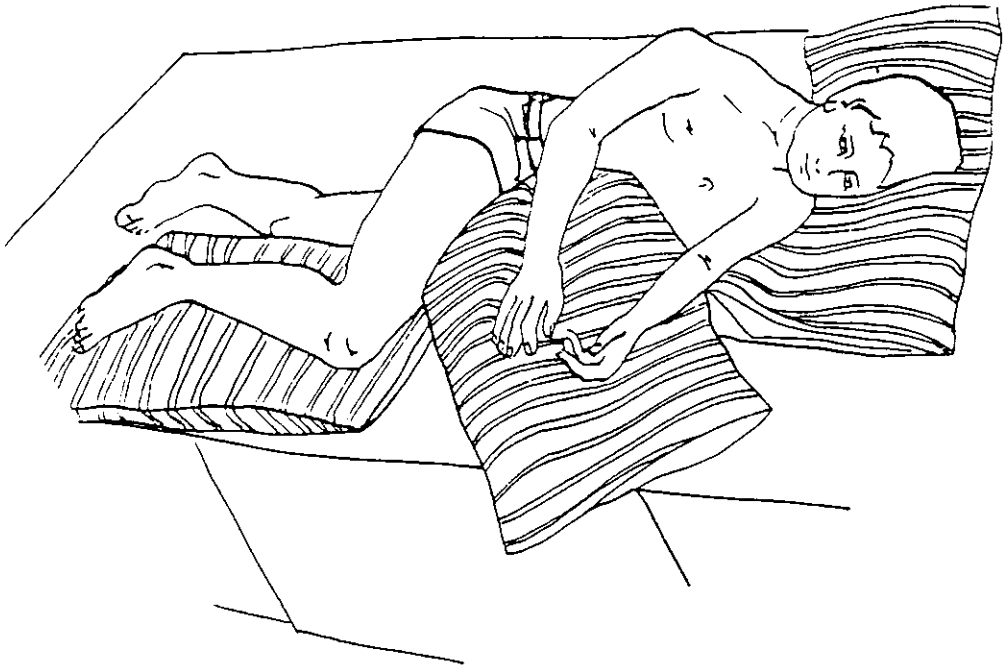
Below are pictures of recommended positions for patients in bed.



Supine position



Side lying on the unaffected side



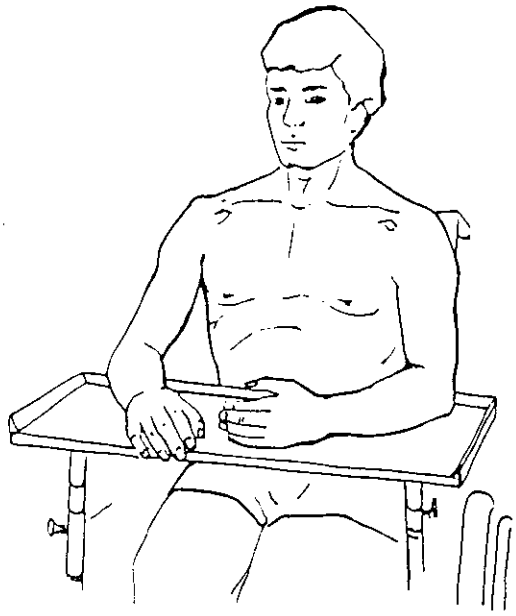
Side lying on the affected side with pillow support

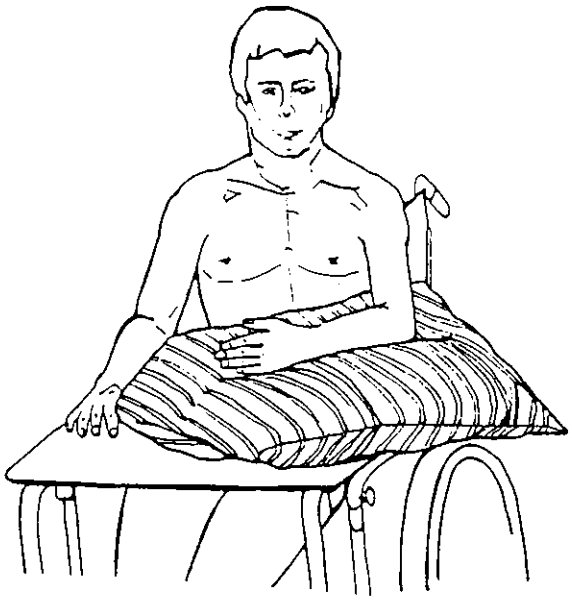
NOTE

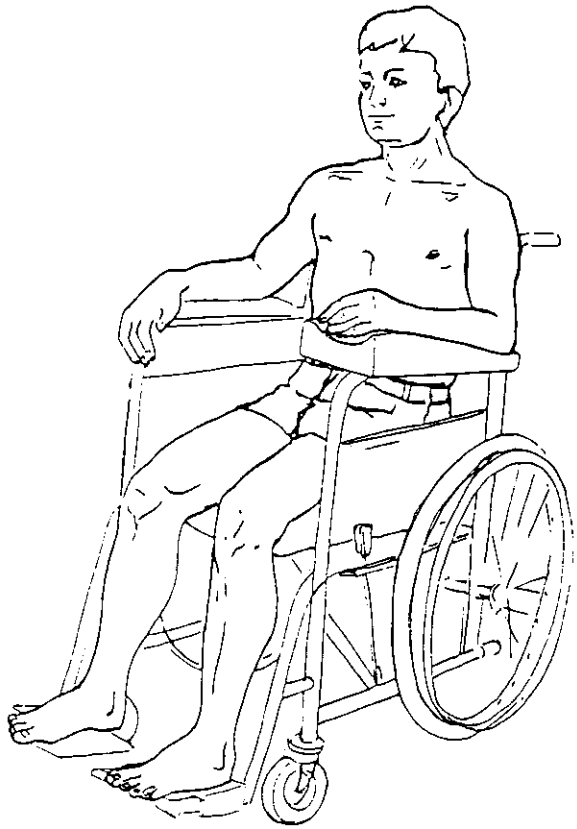
Sidelying positions are best to help avoid spasticity.

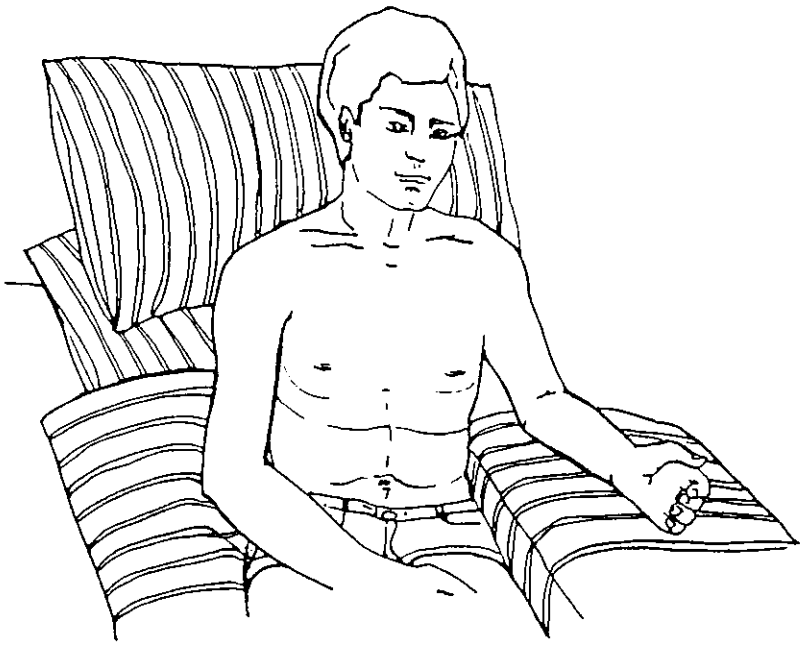
ii) suggested sitting positions

The main goal is to support the flaccid upper limb so that it does not pull on the shoulder joint and cause joint damage.









Question:

A person has left hemiplegia and has a flaccid upper limb. This limb is not supported and the patient develops problems in the left shoulder. In your own words, describe the cause of these shoulder problems.

_____

_____

_____

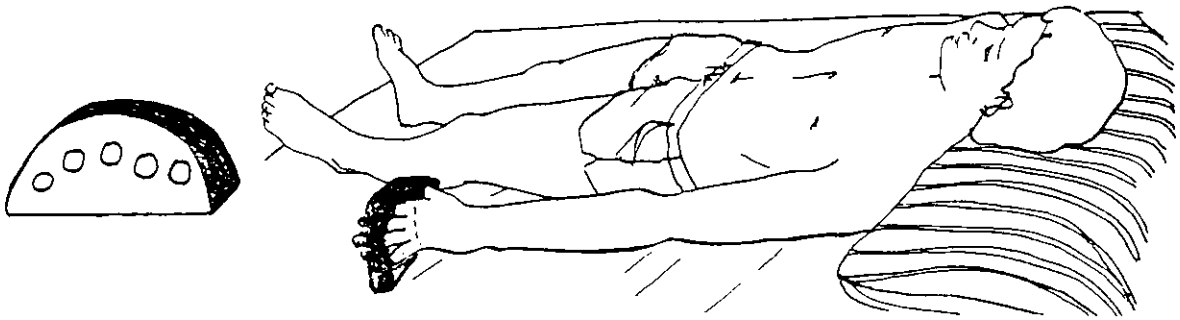
_____

iii) **equipment to help with positioning**

The different devices that can help support the joints during this period are:

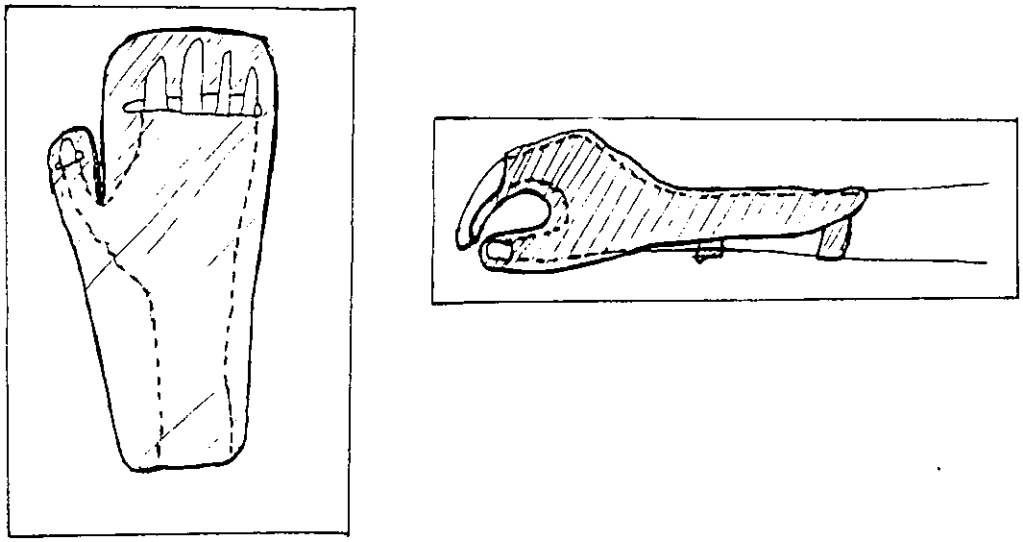
* soft finger divider
* hand splint
* shoulder supports

* soft finger divider



This divider is made of foam rubber. The patient can wear this at night to help keep the fingers apart (helps avoid spasticity).

* hand splint



This is a special splint that covers the posterior side of the hand and anterior side of distal fingers and thumb.

The hand is in a functional position.

The splint does not push in the palm area because pressure on this one area may increase spasticity.

Activity:

A. 

B. 

C. 

D. 

A. Take a regular size piece of paper and draw a line around the outside of the hand.

B. Cut a straight line into the paper about 5 cm from the end of the paper where the fingers and thumb were.

C. Cut around the line that you drew in step A.

D. Put fingers and thumb through the holes that you cut.

The "paper device" you have on your hand is nearly the same form as the hand splint for patients with hemiplegia.

Question:

What is the functional position for the wrist, fingers and thumb?

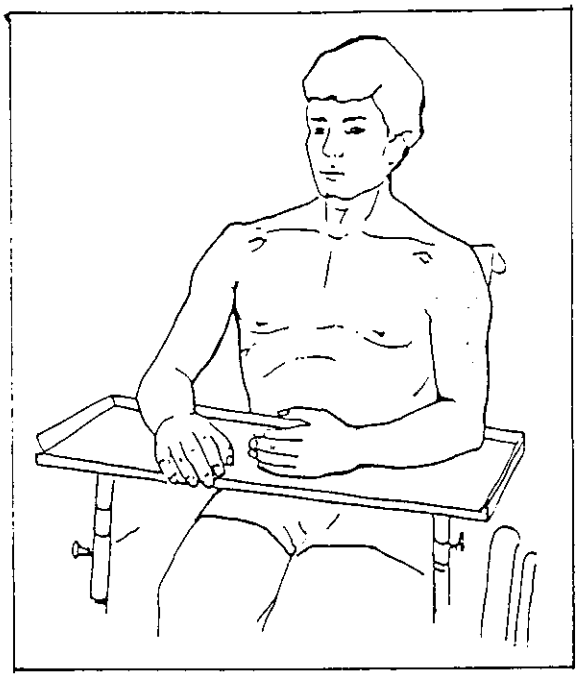
_____

_____

_____

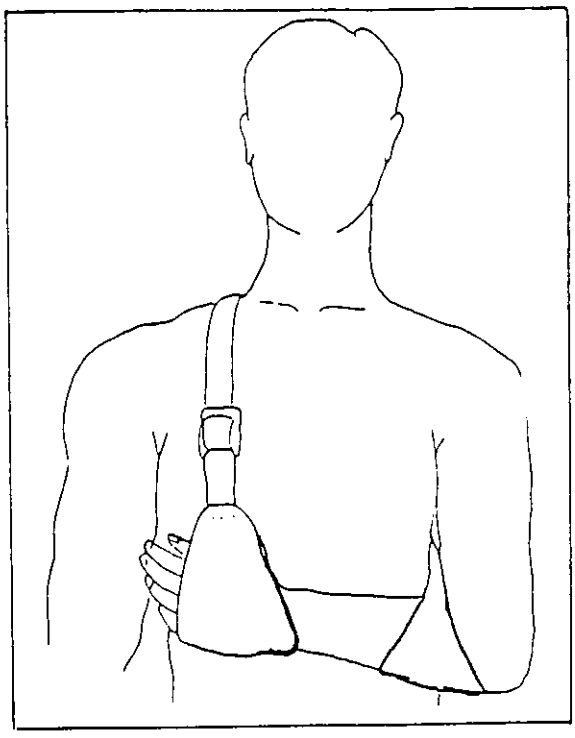
* shoulder support techniques

To help keep the humerus in a good position, the patient can rest the arm on a table in sitting position.

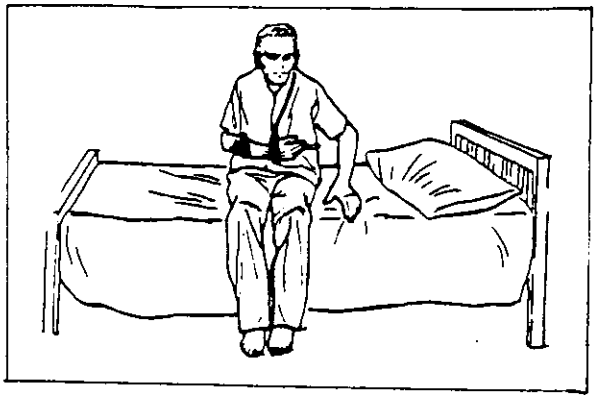


Another very good method to support the shoulder joint is an arm sling (see SLINGS chapter, Volume 2).

The recommended sling is shown below.

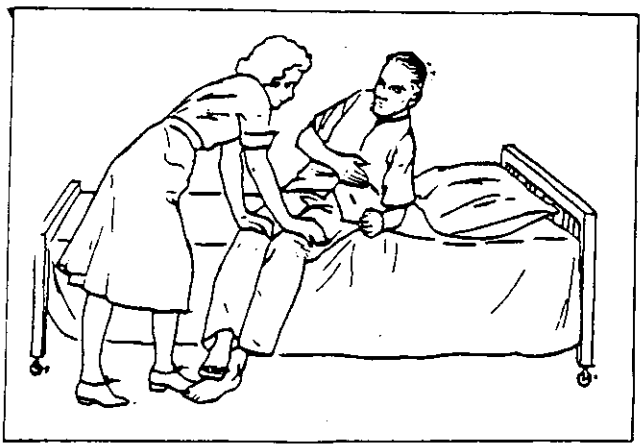


The patient should wear the sling when standing, walking, or sitting without arm support.



b. <u>oriente the patient to the hemiplegic side of the body</u>

The PTA and the patients's family must help the patient "remember" the hemiplegic side of the body and look at materials and places that are on the hemiplegic side.



Because of brain damage, one side of the body and the opposite side of the brain have no communication with each other.

As the brain recovers, communication between the brain and the body can be increased by encouraging the patient to <u>LOOK</u> at the hemiplegic side, <u>TOUCH</u> the hemiplegic side of the body, and <u>USE</u> the hemiplegic side together with the "normal" side of the body.

If the patient does not look at, touch, or try to use the hemiplegic side, communication between the brain and this side will return more slowly or sometimes not at all.

The methods used to help orient the patient to the hemiplegic side are:

* verbal instruction

* mirror

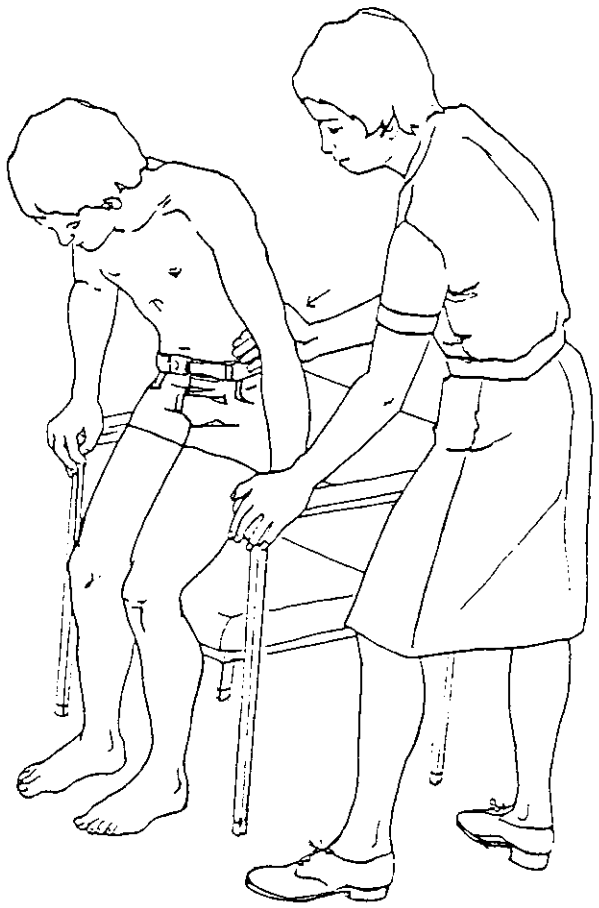
* location of materials and people

* practicing movements using the hemipelgic side

* exercises using both sides of the body

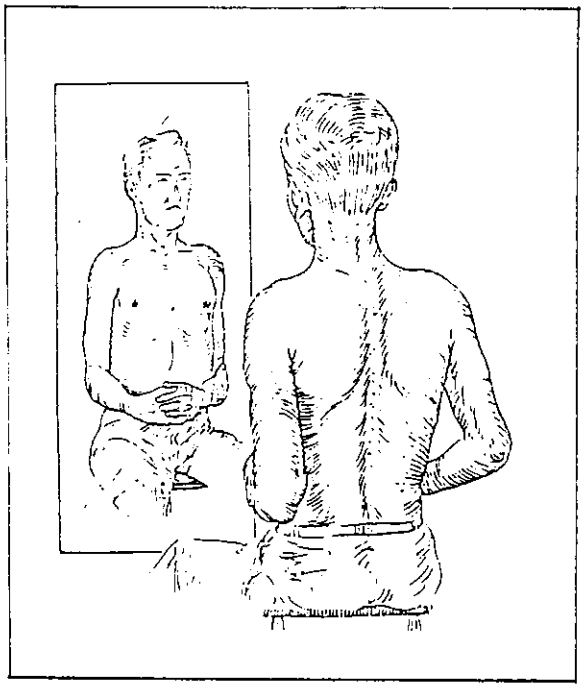
* verbal instruction

The PTA and patient's family must gently remind the patient to look at and take care of the hemiplegic side of the body.



* mirror

The PTA and family can have the patient use a mirror to help identify and correct differences between the hemiplegic and non hemiplegic side of the body.



CAUTION

Some patients can become emotional or cry when they see themselves in the mirror.

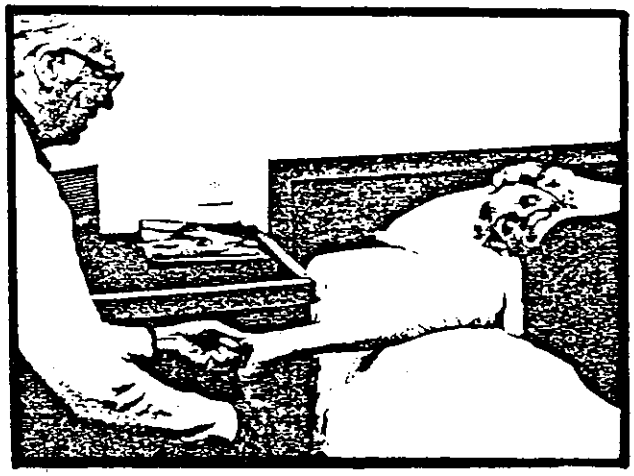
The PTA must respond to the patient's behavior by better explanation of how the mirror helps the patient correct himself, encouraging the patient by identifying positive areas, or sometimes removing the mirror.

* location of materials and people

As much as possible, materials and people should be in front of the patient and <u>on the hemiplegic side</u>.

If all objects were on the hemiplegic side, the patient may feel frustrated and alone.

- Some objects may be in front of the patient while many should be on the hemiplegic side.



<u>Question</u>:

A patient has right hemiplegia. The family puts all of the objects he needs on the left side of his body. When they speak to him, they always stand on his left side.

You are a PTA that works with this patient. Would you recommend something different to the family?

Yes ____ No ___

Explain your answer.

_____

_____

_____

* practicing movements using the hemiplegic side

During the flaccid stage, the PTA or family can help "guide" the hemiplegic limbs in making functional movements.

The patient must experience different feelings and movements with the hemiplegic side of the body.

In this way, information from the hemiplegic side is available for the brain to "relearn".

The PTA's or family member's hand is on the outside of the patient's hand. In this way, the patient has direct contact with different objects.

Examples of guiding the hemiplegic limb are given below.

c. <u>psychological support</u>

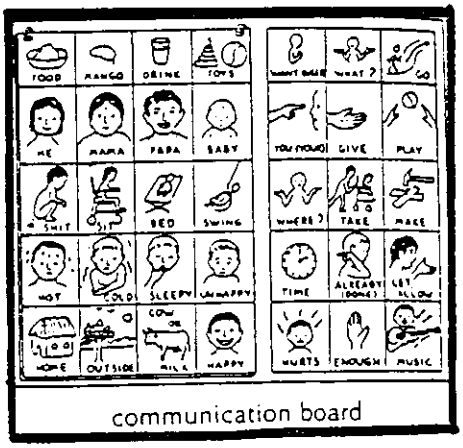
Patients with hemiplegia may have a difficult time to control their emotions.

They may laugh or cry without reason. They may be depressed or easily confused.

Psychological support is especially important for patients with right hemiplegia.

Most often, these patients know they have a problem with their body and are unable to say what they feel or need.

A simple communication board may help patients with right hemiplegia (no speech) tell others what they want.



communication board

d. maintain range of motion (ROM)

The PTA can passively move the paralyzed arm and leg. (See RANGE OF MOTION chapter, Volume 2).

Remember: Move the limb through normal range of motion only. Too much movement will increase joint problems.

Questions:

1. Why is passive ROM needed for the flaccid side of a patient with hemiplegia?

_____

_____

2. A patient has right hemiplegia. The PTA makes passive ROM for the left side and right side of the body. Do you agree with this treatment?

Yes ____ No ___

Explain your answer.

_____

_____

The patient must also learn to make self-ROM for the upper limb.

The patient will hold the hands together and then use the "good" arm to help move the flaccid arm.

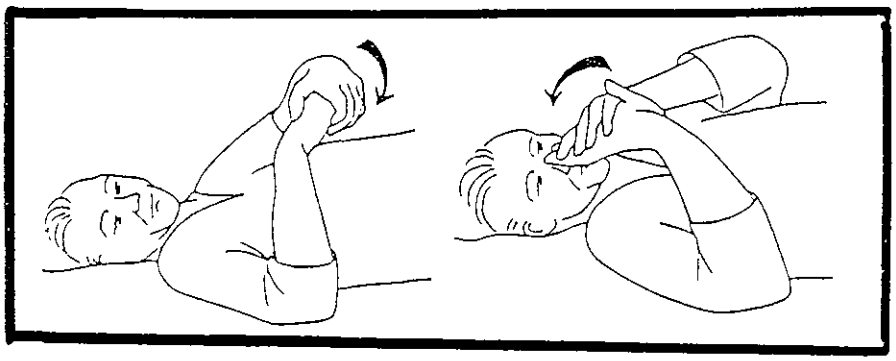
Methods to hold the hands together:

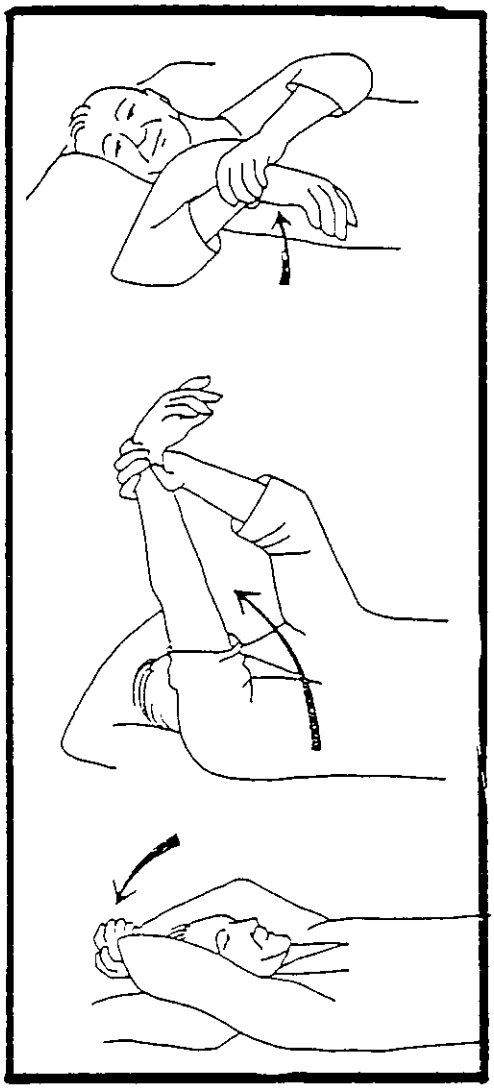
a. all fingers crossed over each other as much as possible. "Hemiplegic thumb" is on the outside.

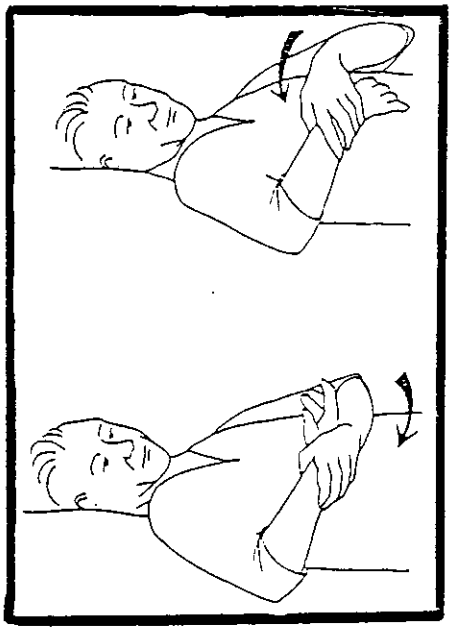
(OR)

b. all fingers crossed over each other as much as possible. "Good thumb" is on the outside.

Techniques for the patient to make self-ROM for the upper limb.







e. practice functional movements

We have said that the patient with hemiplegia should use the hemiplegic side as much as possible. This is true.

The patient with hemiplegia should also be independent in functional activities as quickly as possible.

To be independent in activities often means using the "good" side of the body.

It will be the work of the PTA to help the patient be independent and help the patient practice using the hemiplegic side whenever possible.

Example:

- The PTA will teach the patient how to move from lying to sitting position most easily (normally this is using the "good" side).

- The PTA will also help the patient practise using the hemiplegic side.

Functional movements include:

i) rolling

ii) lying ----> sitting
sitting ----> lying

iii) sitting ----> standing
standing ----> sitting

iv) transfers (bed ----> chair
chair ----> bed)

i) rolling

The patient should practice rolling to both sides of the body.

rolling towards the good side

STEP 1 : Hold hemiplegic arm with the good hand and bring the arm across the body.

(DEMONSTRATION)

STEP 2 : Put the good foot under the hemiplegic foot and move both legs near the side of the bed.

(DEMONSTRATION)

STEP 3 : Patient looks toward the good side and extends both arms toward the good side. This will help the body roll toward the good side.

(DEMONSTRATION)

rolling towards the hemiplegic side

STEP 1 : Patient must move the hemiplegic arm so that is is in abduction.

(DEMONSTRATION)

STEP 2 : The patient bends the good knee so that the good foot is flat on the bed.

(DEMONSTRATION)

STEP 3 : The patient pushes into the bed with the good foot (this will bring the good hip forward) and reaches toward the hemiplegic side with the good arm. This will help the body roll toward the hemiplegic side.

(DEMONSTRATION)

ii) lying ----> sitting and sitting ----> lying

In the beginning, the patient may find it easiest to go from lying ----> sitting from the good side. The patient should practise lying to sitting from both sides to find the method that helps him to be the most independent.

<u>lying ----> sitting from the good side</u>

STEP 1 : Roll toward the good side (see previous section).

STEP 2 : Put the good foot under the hemiplegic foot and move both legs off the side of the bed.

(DEMONSTRATION)

STEP 3 : Bring the good arm above your head and push down with the elbow to help lift the trunk off the bed.

(DEMONSTRATION)

STEP 4 : Extend the elbow and slowly push yourself up to a sitting position.

(DEMONSTRATION)

lying ----> sitting from the hemiplegic side

STEP 1 : Roll toward the hemiplegic side (see previous section).

STEP 2 : Put the good foot under the hemiplegic foot and move both legs off the side of the bed.

(DEMONSTRATION)

STEP 3 : Put good hand on the bed in front of the body and lean body weight forward and push down on this arm. This will help lift the trunk off the bed.

(DEMONSTRATION)

STEP 4 : Reposition arm to continue to help push the body to a sitting position.

(DEMONSTRATION)

Sitting ----> lying is just the opposite movement.

iii) sitting ----> standing and standing ----> sitting

The main rules that the PTA must remember are:

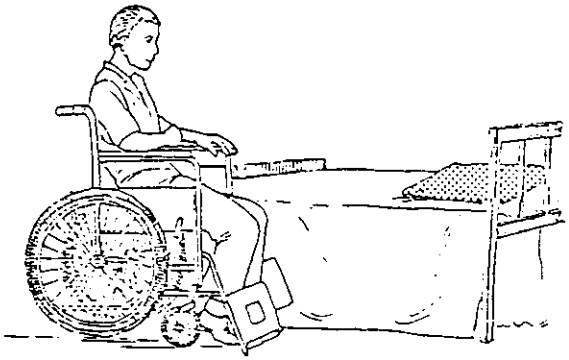
- do not pull on the hemiplegic arm

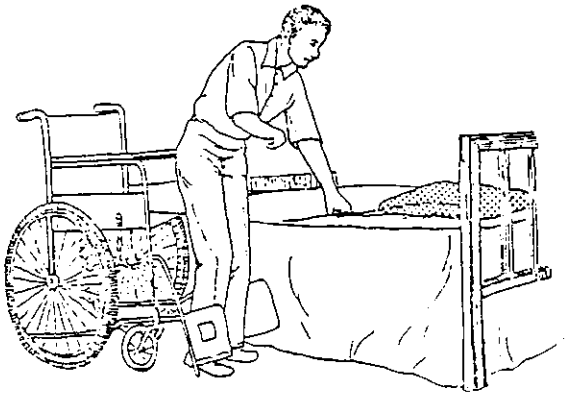
- support the hemiplegic knee to prevent flexion or hyper-extension.

For details on how to help a patient stand, see STANDING CHAPTER, Volume 2.

iv) transfers (bed ---> chair and chair ---> bed

For the most independence in the shortest time, the patient should TRANSFER TOWARD THE GOOD SIDE.



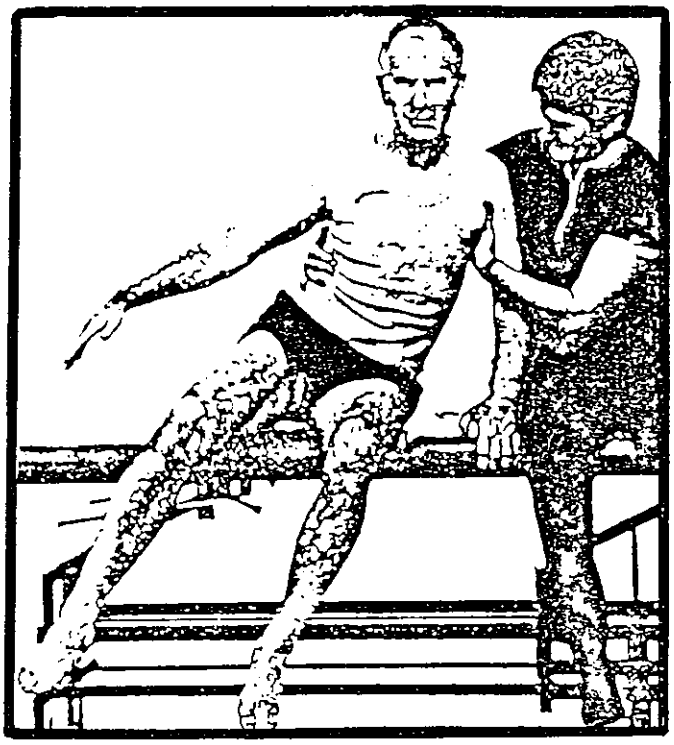


f. balance exercises

Balance exercises in sitting are very good to :

- help the patient increase trunk control on the hemiplegic side
- help the patient to again use both sides of the body together

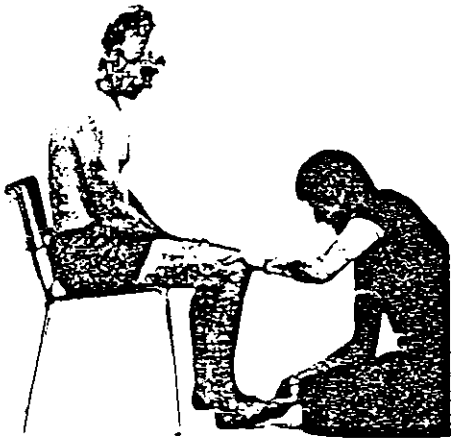
Examples of different balance exercises are seen in the pictures below.



g) <u>stimulate movements not expected in group spasticity</u>

The PTA should encourage the patient to <u>relearn</u> how to move the following muscles

- elbow extensor
- wrist/finger extensors
- ankle dorsiflexor

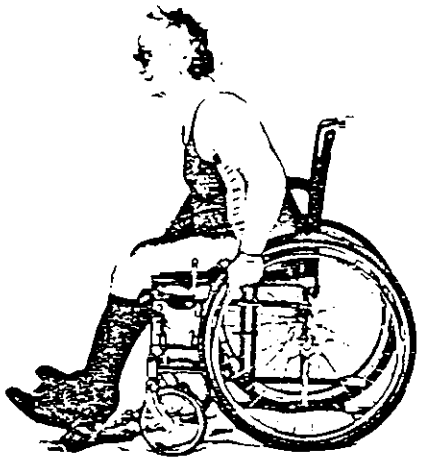


h) provide wheelchair

Patients in flaccid satage of hemiplegia have poor balance and are not able to control the trunk or lower limb.

For these reasons, it is best to have the hemiplegic patient use a wheelchair.

It is helpful if the patient is able to use his good foot to help move the wheelchair.



2. PHYSICAL THERAPY TREATMENT IN SPASTIC STAGE

Note: It is important to remember that not all body parts will be in the same stage at the same time.

(Example - a patient's upper limb may be spastic while the lower limb continues to be flaccid).

The PTA must select activities that are best suited for the individual patient.

Physical Therapy treatment for spastic stage includes:

a. good patient positioning

b. orient the patient to the hemiplegic side of the body

c. psychological support

d. maintain range of motion

e. practice functional movements

f. work on movements independent of "group" spasticity

g. decrease spasticity

h. weight bearing on hemiplegic side

i. preparation for walking

j. independence in eating and dressing

a. good patient positioning

Follow guidelines as given in flaccid stages. Two modifications may be needed:

- If hand splint appears to increase spasticity, the PTA can try to shape it so the fingers are more extended or the splint may be removed.

- If the shoulder muscles have strong spasticity, this may be enough to hold the humerus in a good position. In this case, the arm sling could be removed,

b) orient the patient to the hemiplegic side of the body

Follow guidelines as given in flaccid stage.

Question:

Why is it important to orient the patient to the hemiplegic side of the body as early and as much as possible?

_____

_____

_____

_____

c. psychological support

Follow guidelines as given in flaccid stage.

In addition, the PTA must explain the cause of this uncontrolled movement. The patient and family will be happy to see the movements return, and must be informed not to encourage these movements, but try to encourge movements that have not yet appeared.

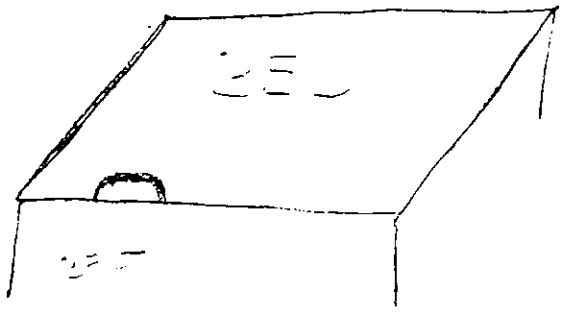
d. maintain range of motion

Follow guideline as given in flaccid stage. The patient and patient's family should be responsible to make ROM.

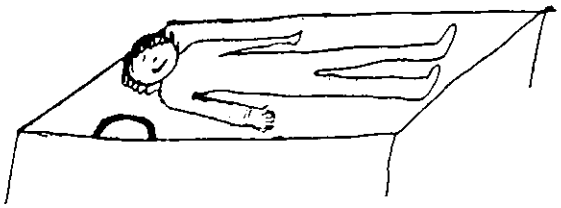
Modifications in this stage may include:

- active/assistive ROM for movements not in "group spasticity"
- passive ROM for movements included in "group spasticity"
- self-STRETCHING exercise for the hemiplegic upper limb.

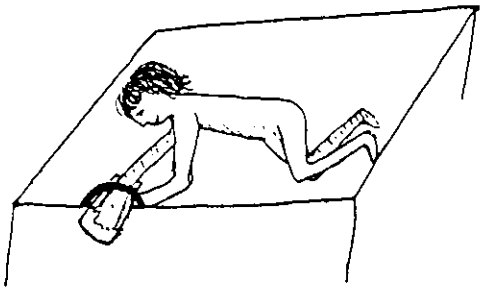
STEP 1 : A belt is attached on the hemiplegic side of the bed - near the head of the bed.



STEP 2 : Patient is wearing a hand splint (page 31-32) and lying supine on the bed.

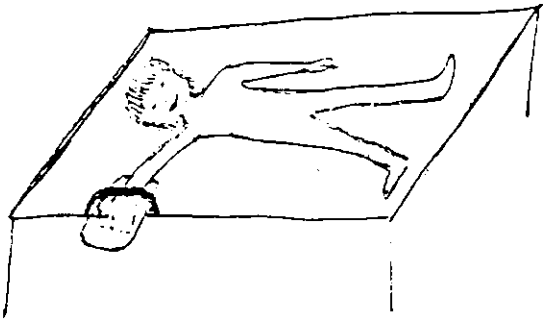


STEP 3 : Patient rolls to sidelying and puts the hemiplegic hand through the belt (forearm is supinated).



STEP 4 : With the arm inside the belt, the patient slowly rolls to a supine position. This movement will put the upper limb in a position of:

- should abduction, and external rotation
- elbow extension
- forearm supination
- hand functional position



The patient can remain in this position for 10-30 minutes, 2-3 times each day.

e. practice functional movements

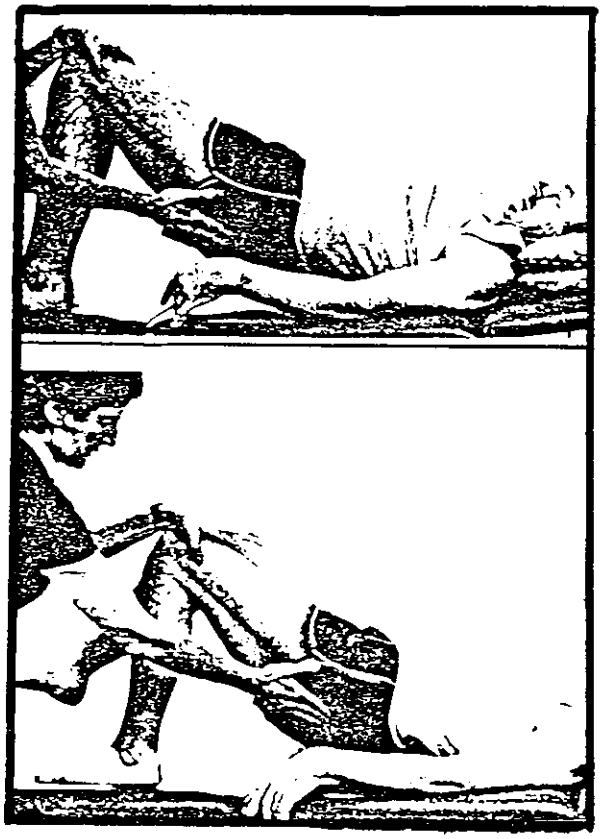
Follow guidelines as given in flaccid stage encouraging more use of the hemiplegic side, and encouraging as much independence in these activities as possible.

f. work on active movements independent of group spasticity

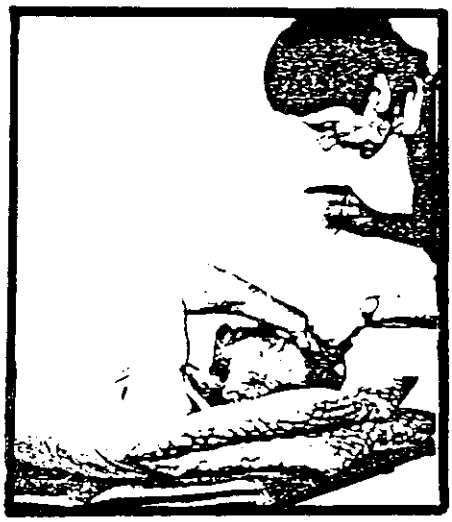
The patient must learn to control the movements on the hemiplegic side.

Examples are:

* hip extension with knee flexion



* elbow extension with shoulder flexion



g. decrease spasticity

Spasticity is the increased and uncontrolled movement of the hemiplegic side.

Most hemiplegic patients will have some spasticity.

The PTA should know that some activities may increase spasticity. These are:

- ROM or stretching that is much too fast
- stress, loud noises
- an activity that is very difficult for the good side

If the patient begins to show spasticity, the PTA can first try to modify the above activities.

Spasticity can also be decreased by breaking "group spasticity". Ways to do this are:

i) specific joint positions

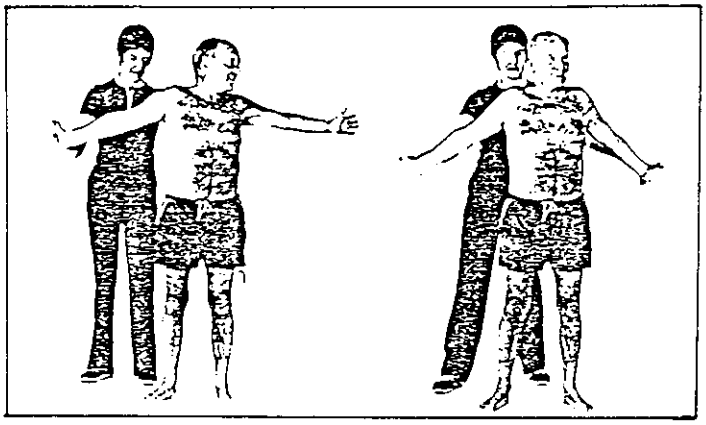
ii) trunk rotation

iii) SLOW muscle stretching

i) specific joint positions

Upper limb position that may help decrease spasticity:

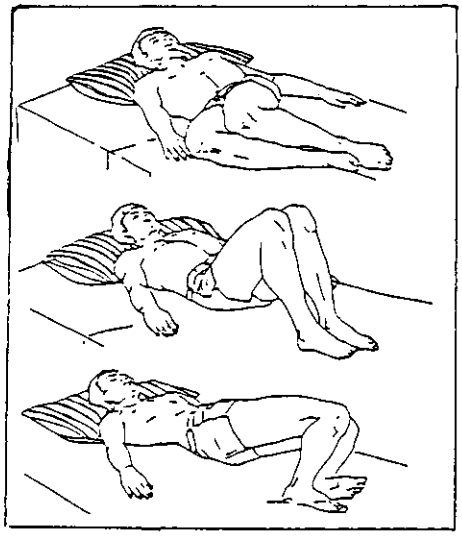
shoulder	- external rotation, ABDuction
elbow	- extension
forearm	- supination
wrist	- extension
fingers	- extension
thumb	- abduction and extension



Lower limb position will depend on the specific patient. The PTA must work with the patient to help identify what positions best decrease the patient's spasticity.

ii) trunk rotation

Moving the hips in one direction and the shoulders in another direction will help to decrease the spasticity in the body.



Trunk rotation exercises are very good for the patient and should be practiced every day.

Rotation helps the body work together, prevents stiffness in the trunk and helps decrease spasticity.

iii) SLOW muscle stretching

A muscle stretch must be slow and constant.

> **WARNING**
>
> A HARD AND FAST STRETCH WILL INCREASE SPASTICITY

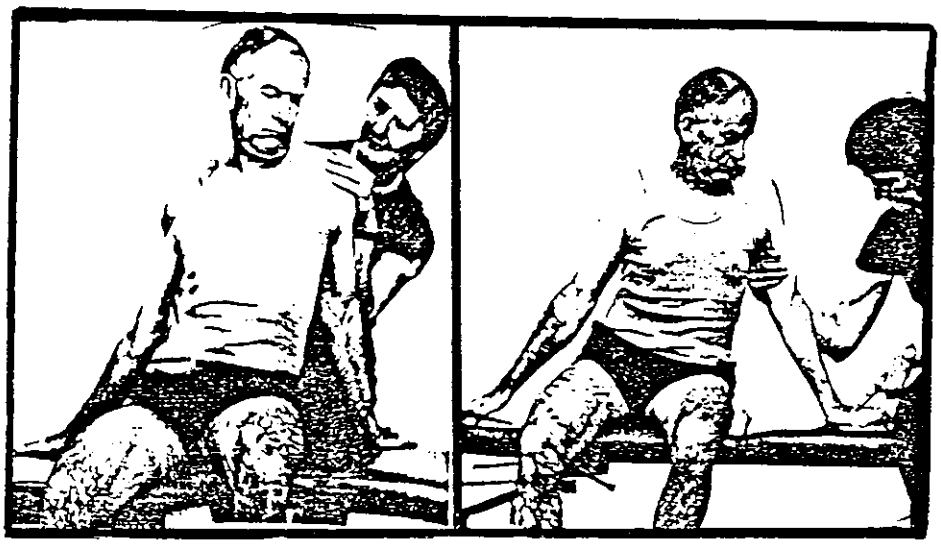
SLOW rotational movements at the proximal joints (shoulder/hip) may help decrease spasticity for the limb.

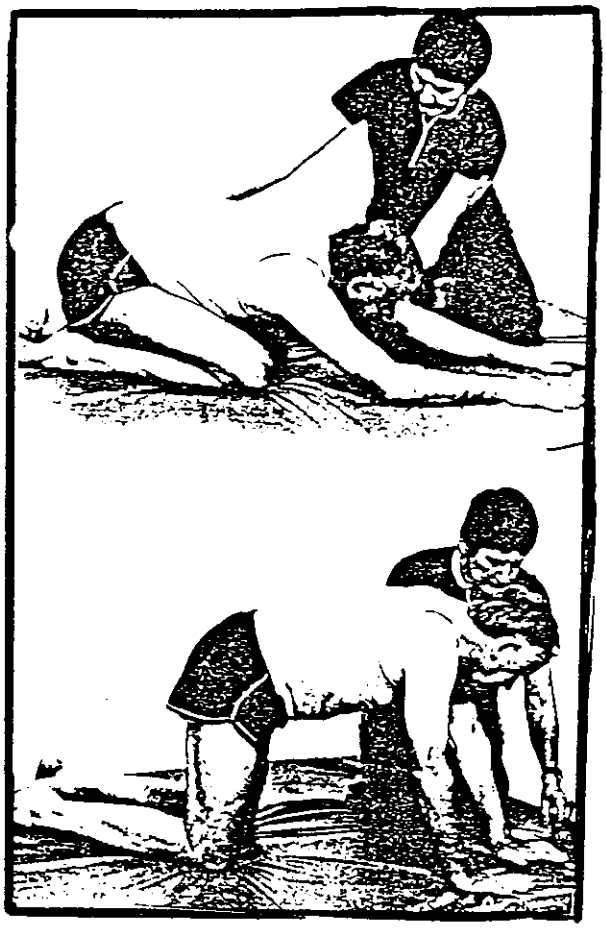
When working with the arm, try to place the leg in an anti-spastic position.

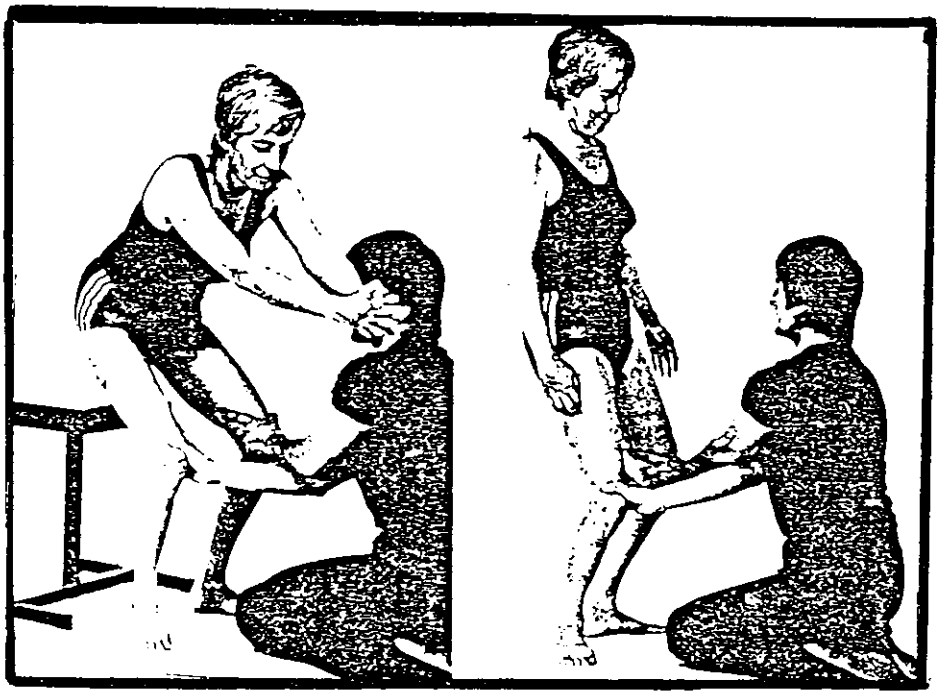
h. weight bearing on the hemiplegic side

Putting weight through a hemiplegic limb gives the joints more information to help them relearn these positions.

Examples of weight bearing on the hemiplegic side are seen in the pictures below.



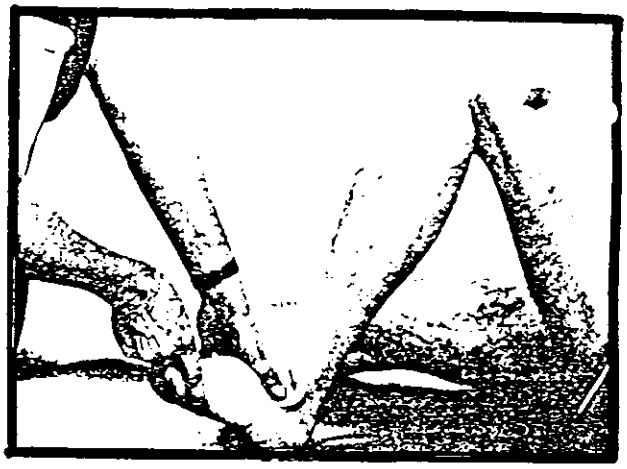


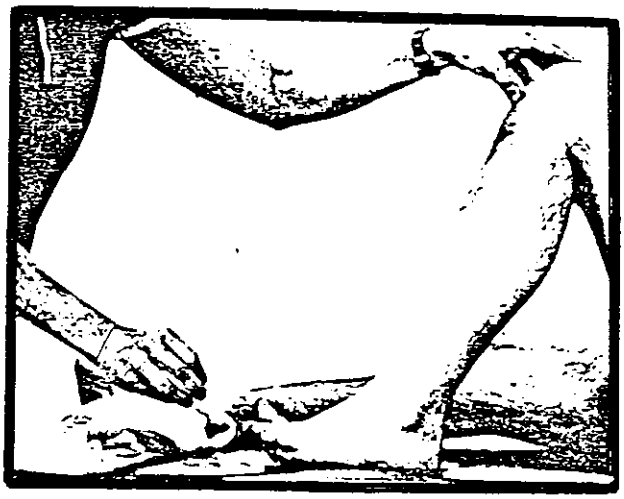


i) preparation for walking

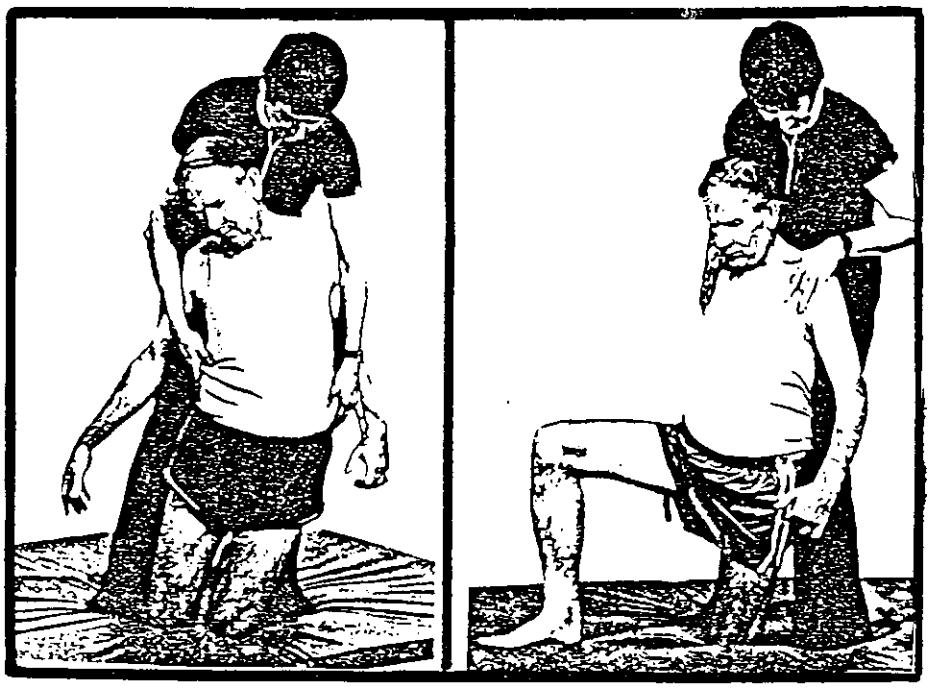
The PTA and patient can work together to help regain control of the lower limbs and trunk by doing the following activities.

IN LYING POSITION

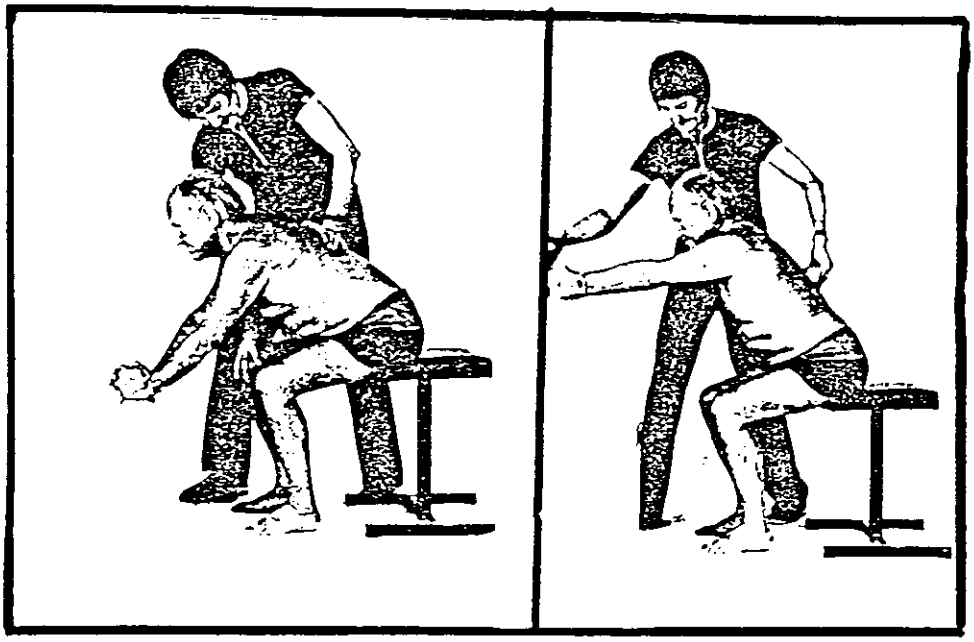




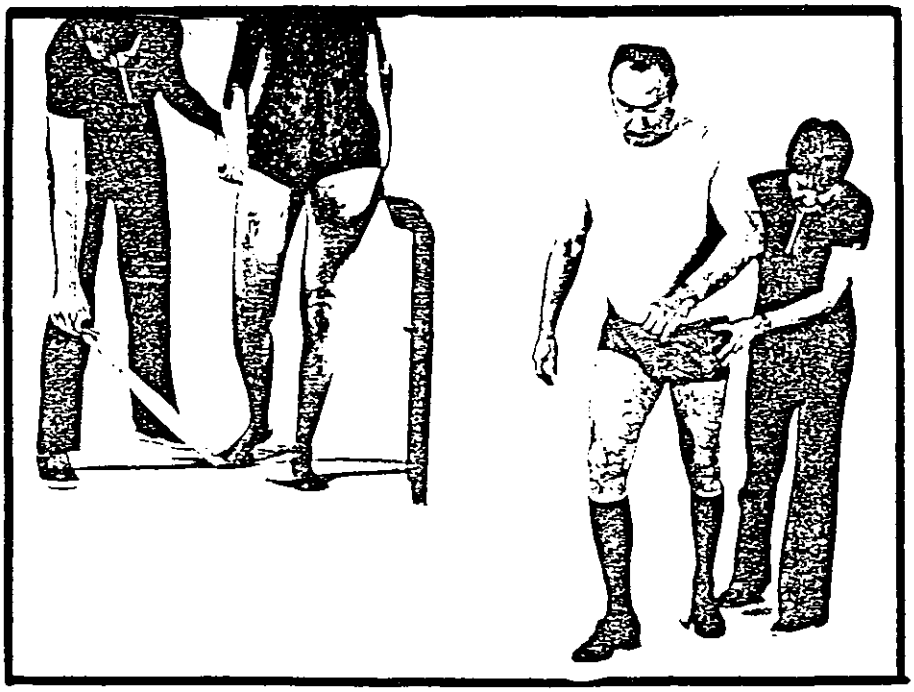
IN KNEELING POSITION



IN STANDING POSITION



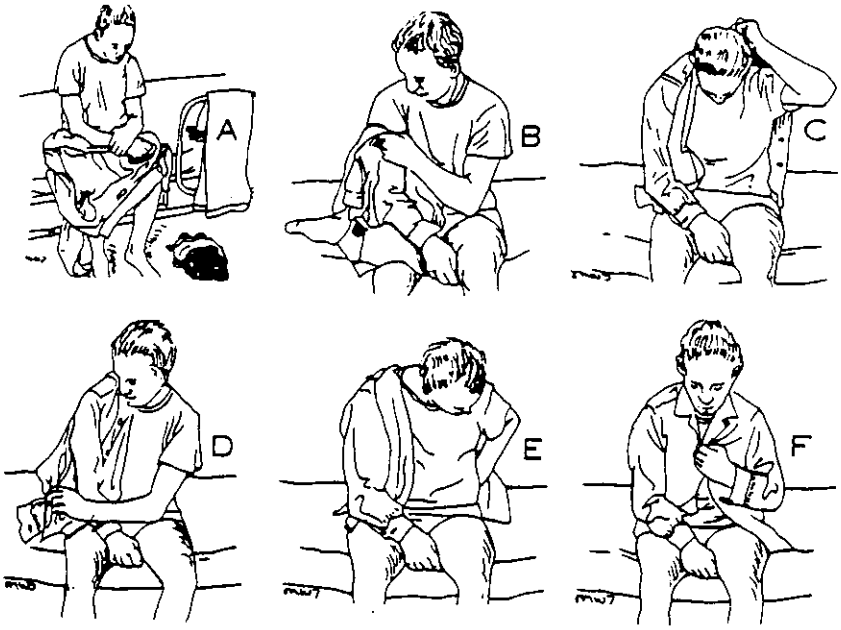
IN STANDING POSITION



Please see GAIT TRAINING for other pre-gait activities.

j. independence in eating and dressing

When the patient puts clothes on, he should always dress the hemiplegic side first.



Many patients may eat with the "good" side. These patients can help to keep plates from moving by using the hemiplegic arm to hold them.

For more details see DEVICES FOR AUTONOMY chapter, Volume 2.

E. PHYSICAL THERAPY TREATMENT IN RECOVERY STAGE

Note: It is important to remember that not all body parts will be in the same stage at the same time.

(Example - a patient may begin to have some controlled movement in the hip, but his ankle continues to be spastic).

The PTA must select activities that are best suited for the individual patient.

Physical Therapy treatment for recovery stage includes:

a. continue all appropriate activities from flaccid and spastic stages

b. walking activities

c. equipment needs

d. house adaptations

e. community integration

a. continuing all appropriate activities from flaccid and spastic stages

The PTA must regularly evaluate the patient and select treatments that will help the patient improve in different areas.

b. walking activities

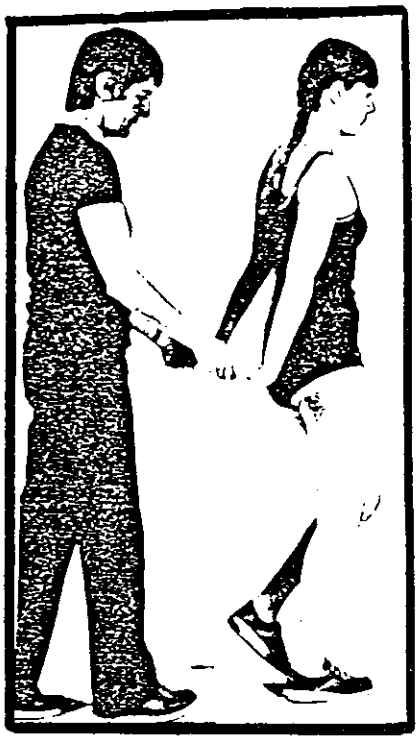
After the patient has good standing balance and some control of the hemiplegic lower limb, he can begin more complete walking activities.

In spastic stage the patient worked on many gait preparation activities.

The PTA should give special care to the following areas.

- heel contacts the ground first (hemiplegic side)
- good weight shifting to hemiplegic side
- hemiplegic knee does <u>not</u> hyperextend during stance phase
- the patient's trunk remains straight
- prevent too much group spasticity in the upper limb.

Below are picture that show how to help the patient in some of these areas.



c. equipment needs

The PTA must identify if any equipment is needed to help improve the function of the patient.

Some patients may need wheelchairs, others may need a walking aid (see WALKING AIDS chapter, Volume 2), others may need a leg brace (see BRACES chapter, Volume 2), and others may need NO EQUIPMENT.

d. house adaptations

When the patient returns home, the house may need some changes to help the patient move more independently.

Hand rails on the inside and outside of the house may be very useful for some patients with hemiplegia.

For more details, see HOUSE ADAPTATIONS chapter, Volume 2.

e. community integration

Questions:

1. Explain what community integration means.

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_____

_____

_____

2. How can the PTA work together with the patient and family to help integrate a hemiplegic patient into the community?

_____

_____

_____

H. CHAPTER SUMMARY

Hemiplegia is uncontrolled movement and decreased feeling in one side of the body.

Hemiplegia is caused from damage to one side of the brain. Damage on one side of the brain will cause problems on the opposite side of the body.

There are 3 stages of hemiplegia:

FLACCID STAGE	- no movement at all on the hemiplegic side
SPASTIC STAGE	- UNCONTROLLED, EXTRA movement of the hemiplegic side. These uncontrolled movements happen in groups (called "group spasticity").
RECOVERY STAGE	- CONTROLLED movement. The patient is able to make some movements independent of the "group spasticity".

Note: Every hemiplegic patient is different. When, if and where these "stages" occur will depend on the individual patient.

Other problems that hemiplegic patients may have:

* "forgetting" the hemiplegic side of the body (and all the objects located on the hemiplegic side)
* speaking - patients with right hemiplegia often lose their ability to speak (but they continue to understand)
* controlling emotions - the patient may laugh or cry for very little reason

It is important to remember that in hemiplegia, the patient's problem is NO CONTROL over movements on the hemiplegic side.

Strengthening and muscle testing are NOT appropriate for hemiplegic patients.

Relearning and controlling movements are the goals of Physical Therapy.

Specific Physical Therapy evaluation and treatment suggestions are given for each of the stages in Hemiplegia.

WHAT IS IMPORTANT FOR YOU TO REMEMBER ABOUT THIS COURSE ?