

# **THE HOLISTIC APPROACH IN REHABILITATION PROCESS OF CARDIOVASCULAR ACCIDENTS (C.V.A.) FOR ADULT POPULATION**

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## **CHAPTER 1. INTRODUCTION**

### **Chapter 1.1 Topic Motivation**

As a health provider with so many years of experience in rehabilitation field, I consider a need to investigate in deep the neurological cases, mainly cardio vascular accidents well known as CVAs or strokes. In the following chapters I will focus on exploring the anatomical components of the human body that are involved after the stroke occurs.

The adult population predisposition to stroke is represented by several factors, as genetics, lifestyle, emotional stress, nutrition and lack of physical exercise. Stroke is the leading cause of adult disability.

### **Chapter 1.2 Introduction in the topic**

In the second part of Chapter I will briefly present statistics from the different continents, regarding the topic chosen to be analyzed in this paper.

According to the World Health Organization (WHO), 15 million people suffer stroke worldwide each year, and from that 5 million die and another 5 million are left permanently disabled.

Stroke subtypes vary greatly in different parts of the world and between different races. For example, the proportion of hemorrhagic strokes may be higher in certain populations, such as the Chinese population, in which it has been reported to be up to 39.4%, and the Japanese, in which it is reportedly up to 38.7%.

About 795,000 Americans each year suffer a new or recurrent stroke. That means, on average, a stroke occurs every 40 seconds.

In 2010, worldwide prevalence of stroke was 33 million, with 16.9 million people having a first stroke. African-Americans have nearly twice the risk for a first-ever stroke than Caucasians and a much higher death rate from stroke.

## **CHAPTER 2. ANATOMY OF HUMAN BRAIN – CVA DEFINITION-SYMPTOMS CAUSES**

### **Chapter 2.1 Anatomy – Physiology – Pathophysiology**

The three main components of the brain—the cerebrum, the cerebellum, and the brainstem—have distinct functions. The cerebrum is the largest and most developmentally advanced part of the human brain. It is responsible for several higher functions, including higher intellectual function, speech, emotion, integration of sensory stimuli of all types, initiation of the final common pathways for movement, and fine control of movement.

1. The cerebrum is the largest and most developmentally advanced part of the human brain. It is responsible for several higher functions, including higher intellectual function, speech, emotion, integration of sensory stimuli of all types, initiation of the final common pathways for movement, and fine control of movement.

The cerebrum is divided into a right and a left hemisphere and it is composed of pairs of frontal, parietal, temporal, and occipital lobes.

2. The cerebellum, the second largest area, is responsible for maintaining balance and further control of movement and coordination.
3. The brain stem is the final pathway between cerebral structures and the spinal cord. It is responsible for a variety of automatic functions, such as control of respiration, heart rate, and blood pressure, wakefulness, arousal and attention.

## CHAPTER 2.2 STROKE / CVA DEFINITION, TYPES (TIA, ISCHEMIC OR HEMORRHAGIC)

### 1. Transient ischemic attack (TIA)

A transient ischemic attack (TIA) — also known as a mini-stroke — is a brief period of symptoms similar to those you'd have in a stroke. A temporary decrease in blood supply to part of your brain causes TIAs, which often last less than five minutes.

### 2. Ischemic strokes are divided into:

- a. thrombotic - where a blood clot forms in a main brain artery or within the small blood vessels deep inside the brain. The clot usually forms around atherosclerotic plaques.
- b. embolic - a blood clot, air bubble or fat globule forms within a blood vessel, elsewhere in the body and it is carried to the brain.
- c. systemi chypoprofusion - a general decrease in blood supply, e.g. in shock.
- d. venous thrombosis

### 3. Hemorrhagic strokes occur when a blood vessel in the brain ruptures and bleeds

- a. Intracerebral hemorrhagic stroke — there is bleeding from a blood vessel within the brain. High blood pressure is the main cause of intracerebral hemorrhagic stroke.
- b. Subarachnoid hemorrhagic stroke — there is bleeding from a blood vessel between the surface of the brain and the arachnoid tissues that cover the brain.

## CHAPTER 2.3 SYMPTOMS, CAUSES AND RISK FACTORS, THAT LEAD TO STROKE

To understand the nature of the effects generated by stroke, it is necessary to speak of the symptoms, causes and risk factors.

The main symptoms that can fluctuate or disappear are:

- **Trouble with speaking and understanding.** A person may experience confusion; may slur the words or have difficulty understanding speech.
- **Paralysis or numbness of the face, arm or leg.** A person may develop sudden numbness, weakness or paralysis in your face, arm or leg, especially on one side of the body. In this case, it is recommended to talk to the subject and put him to raise both your arms over your head at the same time. If one arm begins to fall, he may have a stroke. Similarly, one side of his mouth may droop when he tries to smile.
- **Trouble with seeing in one or both eyes.** A person may suddenly have blurred or blackened vision in one or both eyes, or he may see double.
- **Headache.** A sudden, severe headache, which may be accompanied by vomiting, dizziness or altered consciousness, may indicate a stroke will occur.
- **Trouble with walking.** A person may stumble or experience sudden dizziness, loss of balance or loss of coordination.

Known as the concept "FAST", there are four important aspects that must be taken in consideration to detect and diagnose the disease more quickly and effectively:

- **Face.** Ask the person to smile. Does one side of the face droop?
- **Arms.** Ask the person to raise both arms. Does one arm drift downward? Or is one arm unable to rise up?
- **Speech.** Ask the person to repeat a simple phrase. Is his/ her speech slurred or strange?
- **Time.** If you observe any of these signs, call emergency numbers immediately.

### Risk factors

Many factors can increase the risk of a stroke; at the same time some factors can also increase chances of having a heart attack. Potentially treatable stroke risk factors include:

#### Lifestyle risk factors

- Being overweight or obese
- Physical inactivity
- Heavy drinking
- Use of illicit drugs such as cocaine and methamphetamines

#### Medical risk factors

- High blood pressure — the risk of stroke begins to increase at blood pressure readings higher than 120/80 millimeters of mercury (mm Hg). In common practice, the doctor will help the patient to decide on a target blood pressure based on your age, whether he has diabetes and other factors.
- Cigarette smoking or exposure to secondhand smoke.
- High cholesterol.
- Diabetes.
- Obstructive sleep apnea — a sleep disorder in which the oxygen level intermittently drops during the night.

- Cardiovascular disease, including heart failure, heart defects, heart infection or abnormal heart rhythm.

Other factors associated with a higher risk of stroke include:

- Personal or family history of stroke, heart attack or transient ischemic attack.
- Being age 55 or older.
- Race — African-Americans have a higher risk of stroke than do people of other races.
- Gender — Men have a higher risk of stroke than women. Women are usually older when they have strokes, and they're more likely to die of strokes than are men. Also, they may have some risk from some birth control pills or hormone therapies that include estrogen, as well as from pregnancy and childbirth.

## CHAPTER 2.4 DIFFERENCES BETWEEN LEFT AND RIGHT SIDE STROKE

Right hemisphere is more sensitive to CVA

Right stroke in the brain – paresis of left side	Left stroke in the brain – paresis right side
<ul style="list-style-type: none"> <li>- Visuoperceptual functions</li> </ul>	<ul style="list-style-type: none"> <li>- Language functions</li> <li>-</li> </ul>
<p>Right hemispheric stroke Common impairment and deficits</p> <ul style="list-style-type: none"> <li>- Left hemiplegia (inability to move the arm or leg) or hemiparesis (weakness in the arm or leg)</li> <li>- Problems with depth perception and spatial relationships (which can affect ability to judge where you are in relation to others or other object in the environment)</li> <li>- Unilateral neglect (the patient may not use their left arm or leg even if they can)</li> <li>- Poor visual memory (they can get lost, they do not remember where is their house location)</li> <li>- Poor facial recognition</li> </ul>	<p>Left hemispheric stroke Common impairment and deficits</p> <ul style="list-style-type: none"> <li>- Right hemiparesis or hemiplegia</li> <li>- Impaired ability to think analytically which can interfere in patients’ ability to problem solve during everyday activities</li> <li>- Personality, memory (name of their parents, friends, etc), emotions</li> <li>- Apraxia (loss of ability to perform skilled movements, e.g., how to use a comb, a brush, remote control, keys)</li> <li>- Impaired verbal memory</li> <li>- Body disorientation (e.g., loss of ability to identify body segments, parts)</li> </ul>

Although there are numerous abilities associated with right or left hemispheres, these abilities are not totally “carved in stone”. For example, the right hemisphere contributes to some aspects of language and the left hemisphere participates in some visual skills.

Now is known that the brain attempts to repair itself, but this is often only partial, allowing only incomplete recovery. Together they supposed to create new neurons. Now the

question will be how to amplify the natural processor for increasing the number of new neuron and ensuring that they become incorporated functionally in the brain circuitry.

Along with the natural process of repairing, it will be added rehabilitation exercises to reach our purpose.

### **CHAPTER 3. HOLISTIC APPROACH - EVALUATION - REHABILITATION - NUTRITION – PROFILAXY IN CVA**

. The components of the holistic approach are: the environment, the culture, the society, the family and the long time health care.

Active healthcare puts the patient at the centre of their own care. By maintaining the focus on the whole person and empowering the patients to participate fully in their recovery, the rehabilitation complex process works to support a seamless transition that gets the patients back to life in the community, which is where they belong.

Rehabilitation can be considered holistic approach. I refer at physiotherapy approach, nutrition, diet, modified ADLs, adaptation of patient's house to his needs.

#### **CHAPTER 3.1 EVALUATION FOR THE STROKE PATIENTS**

The purpose of this chapter is to present an overview of physical therapy tests used in stroke rehabilitation.

#### **Clinical Methods**

##### **Interviews**

Interviews are useful for getting the story behind a participant's experiences. The reliability of interviews depends on the respondent's ability to remember correctly and to describe in an objective and precise way facts related to the questions posed by the interviewer.

##### **Observation**

Observation can be either an activity of a human being / therapist, consisting of receiving knowledge of the outside world through the senses, or the recording of data using scientific instruments. Observation can be non –participant or participant.

Clinical observation refers to receiving knowledge of the outside world through the senses and it is based on the formal, informal knowledge and the experience of the therapist. In order to overcome some of these weaknesses structured observations, that therapists routinely goes through a check list, covering the main problem areas and including developing goals for treatment.

### **Measurement-tests**

Measurements can be seen as a form of structured observation and can be generic and specific. Generic / global measures can be used to assess and compare patient populations with different levels of disablement.

Specific measures are specific to a certain condition, body region or patient. They are designed for a specific patient population having a condition, or disability in one part of the body.

#### **TESTS:**

Dynamic Gait Index:

Method of use – the following tests are counted on a distance of 10 m round trip

1. Gait level surface
2. Change in gait speed
3. Gait with horizontal head turns
4. Gait with vertical head turns
5. Gait and pivot turn
6. Step around obstacles
7. Step over obstacles
8. Steps for stairs – up make a turn 360 degrees and down

#### **NIH – Stroke Scale**

The NIHSS is a 15-item neurologic examination stroke scale used to evaluate the effect of acute cerebral infarction on the levels of consciousness, language, neglect, visual-field loss, extraocular movement, motor strength, ataxia, dysarthria, and sensory loss. A trained observer rates the patient's ability to answer questions and perform activities.

Ratings for each item are scored with 3 to 5 grades with 0 as normal, and there is an allowance for no testable items. The single patient assessment requires less than 10 minutes to complete the test.

The evaluation of stroke severity depends upon the ability of the observer to accurately and consistently assess the patient.

## **CHAPTER 3.2 REHABILITATION IN CVA**

### **Physiotherapy**

Physiotherapists should be involved in early stage of disease, and they should make their own assessment of how much they can work with a patient. Early mobilization is associated with better outcomes - even after taking account of the potential confounding influence of disease severity.

If rehabilitation is to take place on a different ward from acute care, the care received should be made as seamless as possible. Type and intensity of therapy should be determined by the patient's needs, not location.

#### **Primary goals of rehabilitation:**



1. Prevent the complications
2. Minimize the impairments
3. Maximize the function

**Optimizing post stroke rehabilitation:**

1. early assessment with standardized evaluations and validated assessment tools
2. early employment of evidence based interventions relevant to individual patient needs
3. patient access to an experienced multidisciplinary rehabilitation team
4. ongoing medical management of risk factors and co-morbidities

**Upper limb impairments such as:** subluxation, contracture, changes in sensation, swelling, weakness, coordination issues, altered muscle power, changes in muscle tone, hand and foot dysfunction.

**Aims of treatment:**

- Prevent shoulder pain and if unable to do so, manage shoulder pain effectively.
- Be selective when choosing compensatory versus remedial intervention methods to treat patients who are predicted to have a low return of motor function and poor functional use of their arm and hand.
- Provide remedially focused rehabilitation to clients who are predicted to change in arm and hand functions.
- Use measures of known reliability and evidence of validity for treatment planning and outcome prediction.

In the upper extremity with severe impairment and/or poor prognosis for recovery the rehabilitation team should focus on a comfortable, pain-free, mobile arm and hand

- Focus on proper positioning to provide support at rest and careful handling during functional activities
- Participate in classes supervised by professional rehabilitation clinicians in institutional or community setting that teach the patient and caregiver to perform self range of motion exercises.
- Avoid use of overhead pulleys (risk of shoulder tissue injury)
- Use some means of external support for stage 1 or 2 upper limb during transfers and mobility
- Place arm and hand in a variety of positions that include placement within the client's visual field
- Use some means of external support to protect the upper limb during wheelchair use

**Treatment techniques:**

- **Strength Training** - There is evidence that strength training can improve upper-limb strength and function without increasing tone or pain in individuals with stroke.
- **Orthotics** - therapy incorporating a dynamic wrist-hand orthotic may be no better than manual therapy. Long term use of static orthoses requires complimentary appropriate treatment opportunities to prevent clenched fist, problems with ADL and hygiene maintenance

- **Gaming** - goal orientated computer gaming has proven to significantly reduce upper limb impairment in stroke survivors
- **Virtual Reality** - virtual reality training has been shown to be effective in restoring upper limb motor impairments and motor related functional abilities.
- **Mirror Therapy** - Mirror therapy has been shown to have a beneficial effect on motor control and function compared with conventional therapy.
- **Robot-Assisted Therapy** - has been shown to have beneficial effect on motor recovery and function.
- **MET – Muscle Energy Technique**

### CHAPTE 3.3 THE ROLE OF NUTRITION IN CVA

Nutrition is much more important in prevention of stroke than is appreciated by most physicians. The powerful effects of statin drugs in lowering the levels of fasting cholesterol, combined with an unbalanced focus on fasting lipids (as opposed to postprandial fat and oxidative stress) have led many physicians and patients to believe that diet is relatively unimportant. Because the statins can lower fasting lipids by 50% to 60%, and a low-fat diet only lowers fasting cholesterol by 5% to 10%, this error is perhaps understandable.

However, a Cretan Mediterranean diet, which is high in beneficial oils, whole grains, fruits, and vegetables and low in cholesterol and animal fat, has been shown to reduce stroke and myocardial infarction by 60% in 4 years compared with the American Heart Association diet.

This may be related to the broad combination of antioxidants included in a healthy diet. A Cretan Mediterranean diet is probably more effective because it provides a wide range of antioxidants from fruits and vegetables of all colors.

### DIET AND NUTRITION

After a stroke you may find that the patient needs to make some changes to what he eats. The patient may have difficulty eating or drinking and may need to change the consistency of your food or drinks. He may be advised to change the types of foods he eats to be lower in cholesterol and/or salt to reduce his chances of having another stroke.

### WHAT IS A HEALTHY DIET AFTER STROKE?

Eating a healthy diet can reduce your risk of having another stroke. Eating a diet low in fat and salt and high in fruits and vegetables reduces the risk factors for another stroke like high cholesterol, high blood pressure, being overweight and diabetes. There may also be foods that interact with new medications you are taking after a stroke requiring you to avoid them.

After a stroke, there is a higher risk of poor nutrition (not getting enough nutrients through eating or drinking). This can mean you lose weight which may slow down your recovery. Poor nutrition can be due to:

- Swallowing problems -dysphagia
- Problems with arm/hand movements (for example, using a knife and fork).
- Problems with memory and thinking (for example, forgetting to eat).
- Loss of appetite (not feeling hungry).

Fresh food can provide your body with all the nutrients you need for good health, it is important to eat a variety of healthy aliments every day.

- Fruits and Vegetables. You should eat plenty of fruits and vegetable, between 5-7 servings per day.

- Grains. Whole grain breads and cereals contain fiber and vitamins. They may reduce the risk of stroke. It is recommended that 2-4 small servings of whole grain daily.
- Lean protein. Limiting the amount of cholesterol you eat is another important step in reducing the risk of another stroke. Choose low-fat meats or other protein sources for 2 small servings per day.
- Limit salt. Eating too much salt/sodium may cause the patient to retain water and raise blood pressure. Cut down on sodium by: using herbs and spices for flavoring; limiting processed and snack foods; not adding extra salt at the table; and reading labels and avoiding foods with high sodium content.

### **TIPS FOR A HEALTHY DIET POST-STROKE**

It is not possible to find 2 individuals with the same nutritional needs. The patient must talk with a registered dietician to learn how to plan and prepare meals and snacks that will enhance his recovery. The following tips will help him get started:

1. Don't miss breakfast—feel healthier, be less hungry, and snack less.
2. Move the salt shaker off the table. Try adding herbs like coriander and basil, or spices like paprika, chili, and black pepper to season the food. Many prepared meals and snack foods contain huge amounts of 'hidden' salt – so check the food labels.
3. Eat high-fiber foods. To lower the cholesterol, it is advised to eat more high-fiber foods like beans, peas, nuts and oily fish (salmon and mackerel), as well as whole grains, such as oats. Use olive oil-based spreads rather than butter and try grilling your food rather than frying it. Always drain away excess oil or fat.
4. Make the switch. Switch white pasta and rice for whole grain equivalents to feel full for longer and to lower your risk of stroke.
5. Make it easy. Keep a bowl of fruit or cleaned vegetable snacks handy. That way, it will be always healthy snacks to munch on.
6. Keep a food diary. A food diary can be a great way to keep track of what you are eating. It can be used to see what adjustments are needed to make and to motivate the patient.
7. Trick your brain. Use smaller plates and bowls to stay in control of the portion size

## CONCLUSIONS

The above mentioned information is a general theoretic view and few practical advices on the CVA cases

The conclusions for our research may be limited to one famous phrase “Is better to prevent than to treat a CVA”

CVA prevention is already mentioned in previous chapters and refers to:

- Nutrition and diet – choosing the correct food for us, our family members and community members.
- Practicing daily physical activities – aerobic or anaerobic effort – 30 min per day, every day if it is possible.
- Choosing a suitable profession, based on the personality of each individual and not on material income.
- Lifestyle for each individual – respect sleeping time (try to sleep minimum 8 hrs per night), avoid extra food, beverages and alcohol intake.
- Trying to balance their emotions by finding activities, places and people that are on the same level of energy like they are.

In case the stroke occurs, we have to take action immediately FAST (<http://www.strokeassociation.org/STROKEORG/>)

FAST is the acronym for evaluating the face grimace, arm moves, slurred speech and time to call emergency immediately.

The process of rehabilitation should be holistic focusing on:

- including multidisciplinary team work in a pleasant environment for the patient
- social reintegration
- avoiding stroke sequels
- avoiding other stroke to occur
- creating a treatment rehabilitation plan: based on medication, patient/family Education in ADLs and others prognostic factors, physical recovery - Increasing ROM , Decreasing pain , Decrease spasticity, Gait training , Balance and coordination training, posture correction , improving muscle power, improving breathing pattern.

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