# CHAPTER 2
# THEORETICAL BACKGROUND

## 2.1 Theoretical Basis

### 2.1.1 Anatomy and Physiology

#### 2.1.1.1 Brain

The brain is a very important body tool because it is the computer center of all body tools. The brain tissue is wrapped by a strong brain and skull membrane lying within the cranial cavity. The adult brain weight is about 1400 grams, half denser and reddish-gray. Boxes are wrapped by three membranes of the brain and protected by the skull bone. The brain floats in a liquid to support the soft, soft brain. This fluid works as a shock absorber due to an outer blow to the head. The meninges of the dead membrane are the membrane that encloses the brain and spinal cord to protect the delicate nervous structures carrying blood vessels and the waters of cerebrospinal secretions minimize the impact or vibration on the brain and spinal cord. The lining of the brain consists of three layers. (Syaifuddin, 2011)

a. Cerebrum

Two cerebral hemispheres, each divided into lobes, form the cerebrum. The gray outer layer, the cerbral cortex, houses the higher mental functions and is responsible for general movement, visceral function, perception, behavior, and the integration of these functions. Commisural fibers interconnect the counterpart areas in each hemisphere, permitting the coordination of activities between the hemispheres. The frontal lobe contains the motor cortex associated with voluntary skeletal movement and fine repetitive motor movements, as well as the

control of eye movement. The parietal lobe is primarily responsible for processing sensory data as it is received.It assits with the interpretation of tactile sensation. The occipital lobe contains the primary vision center and provide interpretatiom of visual data. The temporal lobe is responsible for the perception and interpretation of sounds and determination of their source. The basal ganglia system functions as the extrapyramidal pathway and processing station between the cerebral motor cortex and upper brainstem. (Seidel H. M., 2011)

b. Cerebellum

The cerebellum is located in the posterior cranial fossa, below the posterior cerebellum of the pons variola and medulla oblongata. Sebum function in muscle tone and coordinate muscle movements on the sides of the body which cerebellum weight is approximately 150 g (8-9%) of the brain weight of the whole. Cerebrum is a feedback mechanism that aims to control movements as the movement is in progress. The fragments that concern before being marked by the disruption of the smooth movements generated by the pyramidal disorder include. (Syaifuddin, 2011)

c. Medulla Oblongata

Mylencephalon usually is called the medulla oblongata and forms the lowest portion of the brainstem. Reflex activities, such as heart rate, respiration, blood pressure, coughing, sneezing, swallowing, and vomiting are controlled in this area. The nuclei of cranial nerves IX through XII also are located in this region. (Sue E & Kathryn I, 2012)

d. Pons

Just above the medulla lies the pons, composed, like the medulla, of white matter and reticular formation. Fibers that run transverly accross the pons and through the middle cerebellar peduncles into the cerebellum make up the external white matter of the pons and give it its arching, bridgelike appearance. (Kevin T. Patton, 2013).

e. Disenfalon

The diencephalon (literally, “between brain”) is the part of the brain located between the cerebrum and the midbrain (mesencephalon). Although the diencephalon consists of several structures located around the third ventricle, the main ones are thalamus and hypothalamus. (Kevin T. Patton, 2013).

2.1.1.2 Spinal cord

Part of the central nervous system that describes the last change of embryonic development of spinal cord function:

a. The spinal cord, the nerve center integrates sensory signals that enable the motoric output directly without the intervention of the brain. This function is seen in the work of the spinal reflex, to protect the body from harm and maintain body maintenance.

b. As an intermediate center between the nerves and the brain. All the motoric voluntary commutations from the brain to the muscles of the body communicated first in the spinal motor center of the spinal motor will process the signal as it should before be sending it to the muscle. The audile-center peripheral receptors must first be communicated to the sensory center in the spinal cord. (Syaifuddin, 2011)

2.1.1.3 Crania Nerves

According to (Seidel H. M., 2011) the cranial nerves are peripheral nerves that arise from the brain rather than the spinal cord. Each nerve has motor or sensory functions, and four cranial nerves have parasympathetic functions.

a. Cranial nerve I (olfactory): Sensory - smell reception and interpretation.
b. Cranial nerve II (optic) : Sensory – visual acuity and visual fields.
c. Cranial nerve III (oculomotor) : Motor – raise eyelids, most extraocular movements. Parasymphatetic – pupillary constriction, change lense shape.
d. Cranial nerve IV (trochlear) : Motor – downward, inward eye movement.
e. Cranial nerve V (trigeminal) : Motor – jaw opening and clenching, chewing and mastication. Sensory – sensation to cornea, iris, lacrimal glands, conjunctiva, eyelids, forehead, nose, nasal, and mouth mucosa, teeth, tongue, ear, facial skin.
f. Cranial nerve VI (abducens) : Motor – lateral eye movement.
g. Cranial nerve VII (facial) : Motor – movement of facial expression muscles except jaw, close eyelids, labial speech sound. Sensory – taste, anterior two thirds of tongue, sensation to pharynx. Parasymphatetic – secretion of salive and tears.
h. Cranial nerve VIII (acoustic) : Sensory – hearing and equilibrium.
i. Cranial nerve IX (glossopharyngeal) : Motor – voluntary muscles for swallowing. Sensory – sensation of nasopharynx, gag reflex, taste-posterior one third of

tongue. Parasymphatetic – secretion of salivary glands, carotid reflex. Motor – voluntary muscles of phonation (guttural speech sounds) and swallowing.

j. Cranial nerve X (vagus) : Sensory – sensation behind ear and part of external ear canal. Parasymphatetic – secretion of digestive enzymes, peristalsis, carotid reflex, involuntary action of heart, lungs, and digestive tract.
k. Cranial nerve XI (accessory) : Motor - turn head, shrug shoulders, some actions for phonation.
l. Cranial nerve XII (hypoglossal) : Motor – tongue movement for speech sound articulation, and swallowing.

2.1.2 Definition

Stroke is a malfunction of the brain tissue caused by the sudden reduction or cessation of blood supply. The brain tissue that experiences this will die and can no longer function. Lay people tend to regard stroke as a disease. Instead doctor actually call it clinical symptom arising from a problematic cardiac artery, disease or simultaneously. (Auryn, 2009)

Ischemic stroke is most often caused by a lack of blood flow to the whole or part of the brain, causing deprivation of neurons from glucose and vital oxygen. This deprivation if severe and prolonged, causes disruption to normal cellular processes and ultimately leads to cell death accompanied by rupture of nerve cell membranes. (Alway & Cole, 2011)

Non-hemorrhagic stroke can be ischemia or embolism and cerebral thrombosis, usually occurs after a period of rest, wake up or in the morning. No bleeding occurs but hypoxic ischemia and subsequent

hypoxia and subsequent secondary edema may develop. Awareness generally improves. (Muttaqin, 2012)

Stroke is a term used to describe the neurological changes caused by the disruption of blood supply to the brain. The two main types of stroke are ischemic and hemorrhagic. Ischemic stroke is caused by blockage due to blood clot either blockage due to thrombosis (blood collection causing blockage in blood vessels) or embolism (broken blood clots / foreign objects in the blood vessels that can clog blood vessels into the brain) to the brain. Bleeding into brain tissue or subarachnoid space is the cause of hemorrhagic stroke. The number of ischemic strokes is approximately 83% of all stroke cases. The remaining 17% is a hemorrhagic stroke (Joyce & Jane, 2014)

Non-hemorrhagic stroke or ischemic stroke is the blockage of blood vessels that cause blood flow to the brain partially or completely stopped. (Nurarif & Kusuma, 2015)

According to the author of non-hemorrhagic stroke is a disorder of blood circulation that is blocked in the brain and occur suddenly so that if left unchecked will result in a person experiencing paralysis even unto death.

### 2.1.3 Classification

#### 2.1.3.1 According to (Muttaqin, 2012) Stroke classification:

a. Hemorrhagic Stroke cerebral hemorrhage and may be subarachnoid hemorrhage. Caused by the rupture of blood vessels of the brain in certain area of the brain. Usually occurs when the activity or active, but can also occur at rest. Client awareness generally declines. Cerebral hemorrhage divided into two :

1) Intracerebral Hemorrhage. Rupture of the blood vessels (microaneurysms) mainly because hypertension causes blood to enter the brain tissue, forming a mass that suppressess brain tissue, and causes brain edema. The rapid increases of ICT, can result in sudden death due to brain herniation. Intracerebral hemorrhage caused by hypertension is often found in the area of putamen, thalamus, pons, and cerebellum.
2) Subarachnoid Hemorrhage. This bleeding comes from the rupture of the berry aneuryms or AVM. This ruprured aneurysm is derived from the circulating blood vessels of willis and its branches located outside the brain parenchyma. Rupture of the arteries and discharge into the subarachnoid space cause ICT to rise suddenly, the stretching of pain sensitive structures, and cerebral vascular vasospasm resulting in global brain dysfunction (headache, consciousnesss loss) and focal (hemiparese, sensory hepatitis, aphasia, ets).

b. Non Hemorrhage Stroke is can be ischemia or embolism and cerebral thrombosis, usually after a long period of rest, just waking up or in the morning. No bleeding occurs but hypoxic ischemia develops and may lead to secondary edema. Awareness is generally good. (Muttaqin, 2012)

2.1.3.2 Types of Ischemic stroke (non-hemorrhagic) is divided into 3 types namely (Nurarif & Kusuma, 2015) :

a. Thrombotic stroke: the formation of thrombus that makes clumping.
b. Embolic stroke: the closure of the arteries by a blood clot.

c. Systemic Hypoperfusion reduced blood flow throughout the body due to heart beat disorders.

2.1.3.2 Clasifikation Stroke Non Haemoragik menurut Padila, (2012) is:

a. Transient Ischemic Attack (TIA)

   TIA is an acute focal neurologic deficit arising from cerebral ischemia of the glans and disappears again without residual rapidly in no more than 24 hours.

b. Reversible Ischemic Neurological Deficit (RIND)

   RIND is an acute focal neurologic deficit arising from cerebral ischemia lasting more than 24 hours and disappearing without residual within 1-3 weeks.

c. Completed Stroke (cerebral infarction)

   Completed stroke is an acute focal neurological deficit due to the occlusion or disturbance of blood circulation of the brain which rapidly becomes stable without deteriorating again.

d. Transient Ischemic Attack (TIA)

   TIA is an acute focal neurologic deficit arising from cerebral ischemia of the glans and disappears again without residual rapidly in no more than 24 hours.

e. Stroke in Evolution (Progressing Stroke)

   Stroke in evolution is an acute focal neurologic deficit due to progressive blood circulation of the brain and reaches its maximum in a few hours day.

f. Stroke in Resolution

   Stroke in resolution is an acute focal neurologic deficit due to a brain circulatory disorder that exhibits improvement and reaches maximum in a few hours to a few days.

2.1.4 Etiology

2.1.4.1 According to Jennifer P. Kowalak (2011) the most common etiology of the stroke are:

a. Thrombosis

Thrombosis in the cerebral artery which supply the blood to the brain or the thrombosis of the intracranial blood vessel which block the blood flow.

b. Embolism

Embolism cause of the thrombus forming at the outside of brain such as in the heart, aorta or artery of carotid.

c. Hemorrhage

Bleeding from the artery or intracranial vena such as because of the hypertension, aneurysm rupture, AVM, trauma, hamorrhage distrubance and septic embolism.

d. Hypertension.
e. Family's history of stroke.
f. History of Transient Ischemic Attack.
g. Heart disease .
h. Diabetic mellitus.
i. Hyperlipidemia.
j. Smoking.
k. Alcoholic.
l. Obesity and lifestyle.
m. Contraceptive oral consumption

2.1.4.2 According to (Muttaqin, 2012) the most common etiology of the stroke is:

a. Cerebral Thrombosis

This thrombosis occurs in blood vessels that have occlusion causing ischemia of brain tissue that can cause edema and congestion around him. Thrombosis usually

occurs in older people who are sleeping or waking up. This may be due to a decrease in sympathetic activity and blood pressure that may cause cerebral ischemia. Neurological signs and symptoms often worsen at 48 hours after thrombosis. Some of the following situations may cause brain thrombosis: atherosclerosis, hypercoagulation, arteritis embolism.

b. Hemorrhage

Intracranial or intracerebral hemorrhage includes bleeding in the subarachnoid space or into the brain tissue its self. Bleeding can occur due to atherosclerosis and hypertension. As a result of rupture of the blood vessels of the brain causing the penetration of blood into the brain that can lead to suppression, shift and separation of adjacent brain tissue, so the brain will swell, brain tissue depressed, resulting in brain infarction, edema, and perhaps brain herniation.

c. General Hypoxia is severe hypertension, cardiac pulmonary arrest, cardiac output drops due to arrhythmias.

d. Local hypoxia is Cerebral artery spasm, accompanied by subarachnoid hemorrhage, vasoconstriction of the cerebral artery with migraine headaches.

2.1.5 Sign and Symptoms

2.1.5.1 Symptoms of ischemic stroke may include the onset of weakness, numbness, loss of vision, diplopia, dysarthria, gait abnormality, aphasia, mild head, vertigo or sudden onset disorder. (Alway & Cole, 2011)

2.1.5.2 Sign and Symptoms is suddenly experiencing weakness or paralysis of half the body, suddenly lost sensitivity, speak *pelo*, language disorders, impaired vision, the month is either

congested or not symmetrical, headache, vertigo, decreased awareness, urination disturbed urine, impaired brain function. (Nurarif & Kusuma, 2015)

2.1.6 Pathophysiology

Neutral infection is a reduction in the blood supply to a particular area of the brain. Blood supply to the brain may in local disturbances (thrombus, embolism, vascular bleeding and spasm). Atherosclerosis often/ tends to be an important factor to the brain, thrombus may be from atherosclerotic, or blood may be frozen in areas of stenosis, where blood flow will be slow or turbulence occurs.

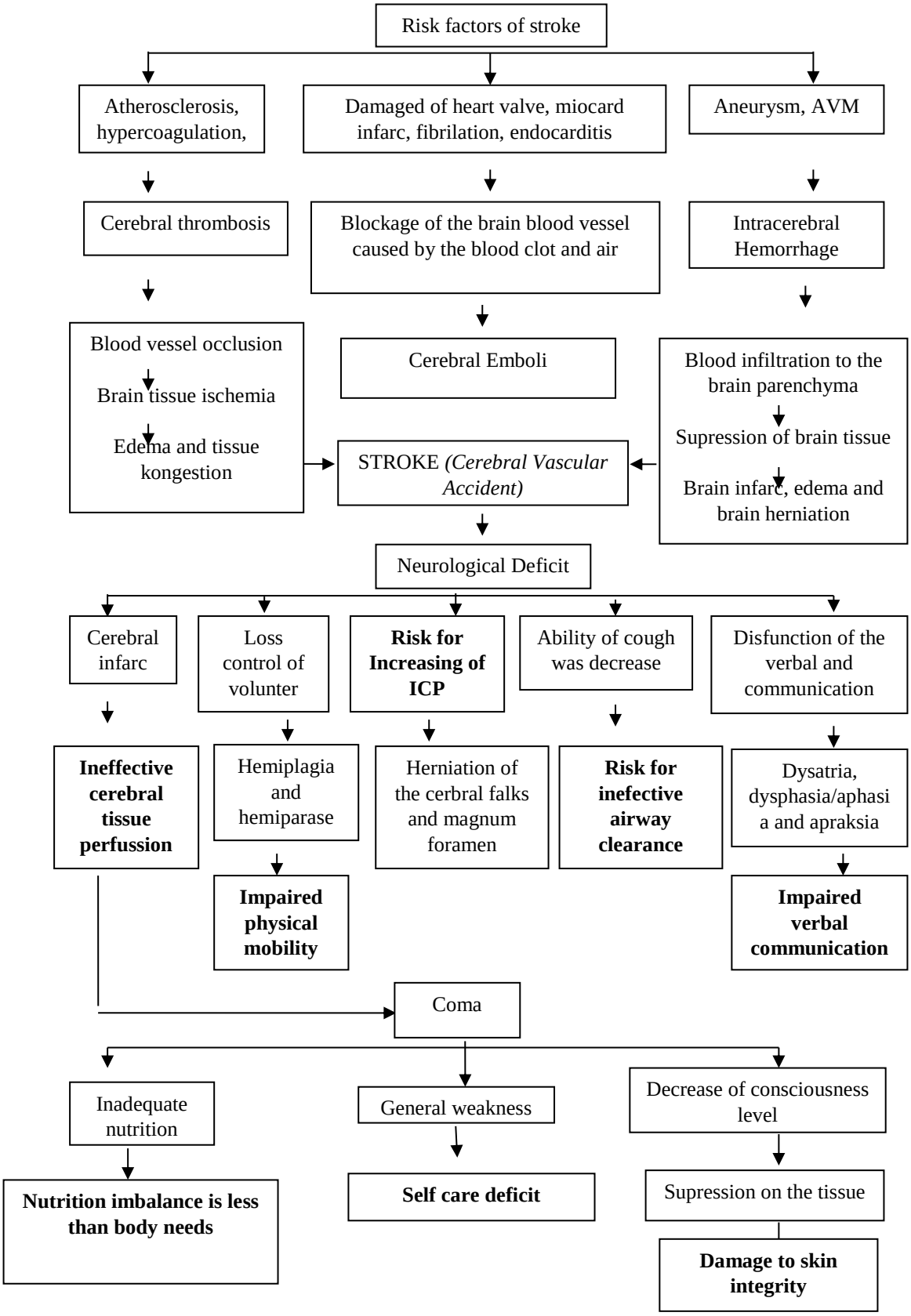
Thrombus results in ischemia of brain tissue supplied by the corresponding vein and edema and congestion around the area. This edema causes a greater dysfunction than the infarct itself.

Bleeding in the brain is more due to arteriosclerotic rupture and blood vessel hypertension. Extensive intracerebral hemorrhage will cause death compared to the overall vascular cerebrovascular disease. If the cerebral circulation is inhibited, cerebral anoxia may develop. Changes caused by cerebral anoxia can be reversible for a period of 4-6 minutes.

In addition to damage to the brain parenchyma, due to the relatively high volume of hemorrhage will result in increased intracranial pressure and decreased brain perfusion pressure as well as brain drainage disorders. Existing vasoactive elements of the blood and ischemic cascade due to decreased perfusion pressure, causing the affected diarrhea of blood and surrounding areas to be suppressed again. (Muttaqin, 2012)

2.1.7 Pathway

Pathway of Stroke (Muttaqin, 2012) modification NANDA NIC-NOC 2015



### 2.1.8 Diagnostic Text

#### 2.1.8.1 According diagnostic examination (Muttaqin, 2012)

a. Cerebral Angiography

   Help determine the cause of specific strokes such as arteriovenous bleeding or rupture and to look for sources of bleeding such as an aneurysm or vascular malformation.

b. Lumbar puncture

   Increased pressure and accompanying blood spots in lumbar fluid suggest hemorrhagic presence in sub arachnoids or intracranial hemorrhage. Increase in the amount of protein suggests an inflammatory process. The results of a red liquid examination are usually found in massive bleeding, whereas small bleeding is usually normal color liquor (xanthochrome) during the first days.

c. CT Scan

   This scan shows specifically the location of edema, the position of the hematoma, the presence of infarct brain tissue or ischemia, and its position with certainty. The results of the examination are usually obtained by focal, sometimes the compaction is seen as diverticular, or spread to the surface of the brain.

d. MRI

   Magnetic Imaging Resonance (MRI) uses magnetic waves to determine the position and the extent/extent of brain hemorrhage. The results of the examination are usually obtained areas that have lesions and infarcts from hemorrhagic.

e. Doppler ultrasound

   To identify the presence of arteriovenous disease (carotid system problems).

f. EEG

This examination aims to look at the problems that arise and the impact of infarct tissue resulting in decreased electrical impulses in brain tissue.

g. Routine blood examination.

h. Blood chemistry examination in stroke can occur hyperglycemia.

2.1.8.2 According to Suzzane C Smeltzer (2010) the assessment and diagnostic methods are:

a. History and complete physical and neurologic examination.

b. Noncontrast CT-Scan.

c. 12 lead of ECG and carotid Ultrasound.

d. CT Angiography and MRI or angiography.

e. Transcranial Doppler flow studies.

f. Transthoracic or transesophageal echocardiography.

g. Xenon – enhanced CT-scan.

h. Single Photon Emission CT (SPECT) scan.

2.1.9 Management

2.1.9.1 According to (Muttaqin, 2012) the purpose of the intervention is to try to stabilize vital signs by taking the following actions:

a. Maintain a patent airway that is to do frequent mucus sucking, oxygenation, if necessary do tracheostomy, assist breathing.

b. Controlling blood pressure based on the patient's condition, including for efforts to improve hypotension and hypertension.

c. Seeks to determine and correct cardiac arrhythmias.

d. Putting the patient in the right position, should be done as soon as possible the patient should be changed position every 2 hours and carried out the exercises of passive motion.
e. Controlling hypertension and decreasing.
f. Vasodilators increase cerebral blood flow (ADS) experimentally, but the meaning: in the human body has not been proven.
g. May be given histamine, aminophylline, acetazolamide.
h. Anti-aggregation of thrombosis such as aspirin is used to inhibit the thrombotic aggregation release reaction that occurs after ulceration.
i. Anti-coagulants may be prescribed to prevent the occurrence/ burden of thrombosis or embolism cardiovascular system.
j. Carotid endarterectomy reshapes the carotid arteriae by opening the carotid artery in the neck.
k. Revascularization is primarily a surgical act and its benefit are most felt by TIA patients.
l. Blood clot evaluation is performed on acute stroke.
m. The malignancy of the communist carotid artery in the neck especially in aneurysms.

2.1.9.2 According to (Smeltzer, 2008)), the goals of medical treatment of hemorrhage stroke are to allow the brain to recover from the initial insult (bleeding), to prevent or minimize the risk for rebleeding, and to prevent or treat complications. They are as follow :

a. Bed rest with sedation to prevent agitation and stress.
b. Management of Vasospasm

Management of vasospasm remains difficult and controversial. Based on one theory that vasospasm is caused by an increased influx of calcium into the cell, medication therapy may be used to block or antagonize this action and prevent or reverse the action of vasospasm already present. Calcium-channel blockers may include nimodipine (Nimotop), verapamil (Isoptin), and nifedipine (Procardia). Other therapy for vasospasm is aimed at minimizing the deleterious effects of the associated cerebral ischemia and includes fluid volume expanders and induced arterial hypertension, norm tension, or hemodilution.

c. Surgical or medical treatment to prevent rebleeding

The goal of surgery is to prevent bleeding in an unruptured aneurysm and further bleeding in an already ruptured aneurysm. This objective is accomplished by isolating the aneurysm from its circulation or by strengthening the arterial wall. An aneurysm may be excluded from the cerebral circulation by means of a ligature or a clip across its neck. If this is not anatomically possible,the aneurysm can be reinforced by wrapping it with muslin or some other substance to provide support and induce scarring.

d. Analgesics

Analgesics codeine and acetaminophen may be prescribed for head and neck pain.The patient is fitted with elastic compression stockings to prevent deep vein thrombosis, a threat to any patient on bed rest.

2.1.9.3 According to (Lewis, 2011)the collaborative care for client with hemorrhage stroke are :

a. Drug Therapy

Anticoagulants and platelet are contraindicated in client with hemorrhage strokes.For clients with hemorrhage stroke is the management of hypertension.Oral and IV agents may be used to maintain blood pressure within normal range.

b. Surgical Therapy

Surgical intervention for hemorrhage stroke include immediate evacuation of aneurysm induced hematomas or cerebellar hematomas larger than 3cm. Individuals who have an AVM may experience a hemorrhage stroke if the AVM ruptures. Treatment of AVM is surgical resection or radiosurgery.

c. Rehabilitation care

After the stroke client has stabilized for 12 to 24 hours, collaborative care shifts form preserving life to lessening disability and attaining optimal function.

## 2.2 Basic Concepts of Nursing Care Non-Hemorrhagic Stroke

2.2.1 Assessment

2.2.1.1 According to (Muttaqin, 2012) the basic concept of nursing care with hemorrhage stroke are:

a. Anamnesis in stroke includes client identity, major complaints, current disease history, past disease history, family history of disease and psychosocial assessment: Including name, age gender, education, address, occupation, religion, ethnicity, national, date and hour of entered Hospital, registration number, and medical diagnosis.

b. The main complaint often the reason for the request for health help is weakness of the limb of the body, talking *pelo*, unable to communicate and decreased level of awareness.
c. History of the disease now, Stroke attacks often occur very suddenly, when the client is doing the activity. There is usually headache, nausea, vomiting and even seizures until unconscious, in addition to symptoms of paralysis or other brain disfunction. The decrease or change in the degree of awareness due to changes in intracranial. Behavior change behavior is also common. According to disease progression, may occur lethargy, not responsive, and coma.
d. Past medical history a history of hypertension, diabetes mellitus, heart disease, anemia, history of head trauma, old oral contraceptives, anti-coagulant drugs, aspirin, vasodilators, drugs, obesity. Use of hypertensive drugs, beta blockers. The history of smoking, use of alcohol and the use of oral contraceptive drugs. This history review may support the assessment of the current disease history and is a baseline for further study and to provide further action.
e. Family disease history, there is usually a family history of hypertension, diabetes mellitus or a history of stroke from previous generations. (Muttaqin, 2012)

2.2.2.2 According to (Rohmah & Walid, 2014) collected date pattern of health function:

a. Pattern of Nutrition and Metabolism

   Filled with the client's habits in fulfilling the nutritional needs before sick up to the pain (current) which

includes the type of food and beverages consumed, frequency eat the portion of the meal is spent on food interlude, the preferred food, food allergies. Complaints related to nutrition such as nausea, vomiting, and difficulty swallowing.

b. Elimination pattern

Filled with *alvi* elimination (defecation) and urination. The elimination pattern illustrates client elimination before illness up to current (current), which includes: frequency, consistency, color, odor, blood and others.

c. Activity Patterns and Personal Hygiene

Filled with routine activities performed by the client before the ill to the point of illness from waking to sleep again, including the use of time leisure. Mobility during illness and self-care activities such as eating, drinking, bathing, dressing and decorating.

d. Sleep Rest Pattern

Filled with the quality and quantity of the client's bed rest before the time of the illness, including the number of hours of sleep, the feeling of the client during waking, and the difficulties or problems of sleep such as difficulty sleeping long, not fit, waking up early, or unable to continue sleeping

2.2.2.3 Based on assessment according to (Wijaya & Putri, 2013)

Physical examination:

a. Integument

Pale or cyanosis of central or peripheral, can distant seen of the lips or fingertips/ nails base indicates a decrease in peripheral perfusion.

b. Head and neck

Increasing of jugular venous pressure,tracheal deviation.

c. Ears

Usually there are no abnormalities.

d. Eyes.

Pale of the conjunctiva as a result of anemia or nutritional deficiencies.

e. Face, nose, and mouth cavity

Pale or cyanosis of the lips/ mucosa indicates decreased perfusion, Inability to swallow, Hoarseness.

f. Thorax and lungs

1) Respiratory tachypnea Shallow breathing.
2) The use of accessory respiratory muscles.
3) Dry cough/ loud/ non productive or persistent cough may be with or without sputum.
4) Increased fremitus, krekels inspiration or expiration.

g. Cardiovascular system

1) Heart rate may be increased/ tachycardia (150 times/ minutes or more at rest).
2) The sound of movement pericardial (pericardial effusion).

h. Abdomen

Bowel sounds increased / decreased.

i. Urogenital system

The increase in the frequency or amount of urine.

j. Reproductive system

Gynecomastia, amenorhea, impotence.

k. Lymphatic system

Enlargement of regional lymph nodes: neck, armpits (metastases).

l. Musculoskeletal system

1) Decreased muscle strength.
2) Clubbing fingers.

m. Neurological system

Changes in mental status/ consciousness: apathy, lethargy, confusion, disorientation, anxiety and depression, difficulty concentratin.

2.2.2.4 Physical examination should be done persistently B1-B6 with the focus of physical examination on a targeted B3 (Brain) examination and associated with client complaints. (Muttaqin, 2012).

a. B1 (Breathing), the inspection was obtained by the client cough, increased sputum production, shortness of breath, the use of breathing muscle and the increase of respiratory frequency. Auscultation of additional breath sounds on the client with increased production of secretions and decreased coughing ability is often attributed to stroke clients with coma awareness levels. In the client with the conscious level of compos mentis, the assessment of inspection respiratory no abnormalities. Palpation of the thorax obtained tactile fremitus balanced right and left. Auscultation no additional breath sounds.
b. B2 (Blood), assessment of the cardiovascular system was obtained by shock (hypovolemic shock) which often occurs in stroke clients. Blood pressure usually increases and massive hypertension (blood pressure> 200 mmHg) occurs).
c. B3 (Brain), stroke causes various neurological deficits, depending on the location of the lesion. Inadequately functional area measure and collateral blood flow.

d. B4 (Bladder), after a client stroke may be temporary urinary incontinence due to confusion, inability to communicate needs, and inability to control the bladder due to motoric and postural motor damage.
e. B5 (Bowel), swallowing, decreased appetite nausea, vomiting in the acute phase. the pattern of defecation usually occurs constipation due to decreased intestinal peristaltic. and the presence of continuous *alvi* incontinence suggests extensive neurological damage.
f. B6 (Bone), the difficulty to move due to weakness, loss of sensoria tau paralyses/ hemiplegia, and easy Tired cause problems on the pattern of activity and rest.

2.2.2 Nursing Diagnosis

2.2.2.1 According to (Muttaqin, 2012) nursing diagnosis stroke non hemorrhagic is:

a. Impaired physical mobility related hemiparesis/ hemiplegia, neuromuscular weakness in extermination.
b. Verbal communication vocabulary associated with the effects of damage to the speech area in the brain hemiparesis, loss of control of facial or oral muscle tone, and general weakness.
c. Self-care deficit associated with neuromuscular weakness, decreased strength and awareness, loss of muscle control/coordination characterized by ADL weakness, such as eating, bathing, regulating, water temperature, folding or wearing clothing.

2.2.3 Nursing Intervention

2.2.3.1 Impaired physical mobility related hemiparesis/ hemiplegia, neuromuscular weakness in extermination.

**NOC Results:**

a. Joint Movement: Active
b. Mobility Level
c. Self care: ADLs
d. Transfer performance

**Criteria results:**

a. Clients increase in physical activity.
b. Understand the purpose of increasing mobility.
c. Verbalize feelings in increasing the strength and ability to move.
d. Demonstrate the use of tools.
e. Help for mobilization (walker).

**NIC :**

**Exercise therapy: ambulation**

1) Monitoring vital sign before and one exercise and see patient response during exercise.
2) Consult with physical therapy about ambulation plans as needed.
3) Help the client to use the walking stick and prevent it from injury.
4) Teach patients or other health workers about ambulatory techniques.
5) Review the patient's ability in mobilization.
6) Train patients to meet the needs of ADL independently according to ability.
7) Assist and assist patients in the mobilization and aids in the need for ADL.
8) Provide tools if the client requires.
9) Teach the patient how to change the position and give help if needed.

2.2.3.2 Verbal communication vocabulary associated with the effects of damage to the speech area in the brain hemiparesis, loss of control of facial or oral muscle tone, and general weakness.

**NOC Results:**

a. Anxiety self control.
b. Coping.
c. Sensory function: hearing & vision.
d. Fear self control

**Criteria results:**

a. Communication: acceptance, interpretation and expression of oral, written, and no verbal messages increased.
b. Expressive communication (speech impediment): the expression of verbal and/ no verbal messages is meaningful.
c. Receptive communication (listening difficulty): communication acceptance and interpretation of verbal and or no verbal messages.
d. Coordinated movement: able to coordinate movement in using cues.
e. Able to communicate needs with the social environment.

**NIC**

**Communication Enhancement: Speech Deficit**

1) Give one symbol sentence each meet, if needed.
2) Consult your doctor's need for speech therapy.
3) Encourage the patient to communicate slowly and to repeat the request.
4) Attentively.
   Standing in front of the patient while talking.

5) Teach talk of esophagus, if needed.
6) Give positive praise, if necessary.
7) Suggest group meetings.
8) Recommend regular family visits to stimulate communication.

2.2.3.3 Self-care deficit associated with neuromuscular weakness, decreased strength and awareness, loss of muscle control/ coordination characterized by ADL weakness, such as eating, bathing, regulating, water temperature, folding or wearing clothing.

**NOC :**

a. Activity intolerance
b. Mobility: Physical Impaired
c. Self Care Deficit Hygiene
d. Sensory pereption, Auditory dusturbaed

**Criteria results:**

a. Selfcare ostomy: a personal act of maintaining an ostomy for elimination.
b. Selfcare: daily life activities (ADLs) are capable of performing physical and personal care activities independently or with aids.
c. Selfcare bath: able to clean the body independently with or without tools.
d. Able to maintain the mobility necessary to go to the bathroom and provide toiletries.
e. Clean and dry the body.

**NIC :**

**Self care asisstance: Bathing/Hygiene**

1) Consider patient culture when promoting selfcare activities.

2) Consider the age of the patient when promoting selfcare activities.
3) Determine the amount and type of assistance needed place towels, soap, deodorant, shaver, and other accessories needed beside the bed or bathroom.
4) Provide the desired personal articles.
5) Providing a therapeutic environment to ensure a warm, relaxing, personal, and personal experience.
6) Facilitate Self bath patient, according to ability.
7) Monitor patient's skin integrity.
8) Keep the ritual cleanliness. (Nurarif & Kusuma, 2015)