CHAPTER 2 THEORETICAL BACKGROUND

2.1 Anatomy Physiology

2.1.1 Anatomy and Physiology of Central Nervous System

The central nervous system (brain and spinal cord) is the main network of coordination and control for the body. The brain and spinal cord are protected by the skull and vertebrae, the meninges, and the cerebrospinal fluid. Three layers of meninges surround the brain and spinal cord, assisting in production and drainage of cerebrospinal fluid. Cerebrospinal fluid circulates between an interconnecting system of ventricles in the brain and around the brain and spinal cord, serving as a shock absorber (Seidel, 2011).

2.1.1.1 Brain

The brain is one of the largest organs in adults. It consists, in round numbers, of almost 100 billion neurons and roughly the same number of glia. In most adults, it weighs about 1,4 kg (3 pounds). Six major divisions of the brain, named from below, upward, are as follows: *medulla oblongata, pons, midbrain, cerebellum, diencephalon,* and *cerebrum*. Very often the medulla oblongata, pons, and midbrain are referred to collectively as the *brainstem*. Three divisions of the brain make up the brainstem (Kevin T. Patton, 2013).

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 (corpus collosum) 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 (Seidel, 2011).

b. Cerebellum

The cerebellum (literally "little brain") is located just below the posterior portion of the cerebrum and is partially covered by it. A transverse fissure separates the cerebellum from the cerebrum. The cerebellum is the second largest part of the brain (after the cerebrum) but has more neurons than all the other parts of the nervous system combined (Kevin T, Patton, 2013).

The cerebellum aids the motor cortex of the cerebrum in the integration of voluntary movement. It process sensory information from the eyes, ears, touch receptors, and musculoskeleton. Integrated with the vestibular system, the cerebellum uses the sensory data for reflexive control of muscle tone, balance, and posture to produce steady and precise movements (Seidel, 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. Diencephalon

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).

The thalamus about 80% of the diencephalon, consists of two oval masses of gray matter that serve as relay stations for sensory impulses, except for the sense of smell, going to the cerebral cortex. When the impulses reach the thalamus, there is general awareness and crude recognition of sensation. The thalamus channels the impulses to the appropriate region of the cortex for discrimination, localization, and interpretation (Applegate, 2011).

The hypothalamus consists of several structures that lie beneath the thalamus and form the floor of the third ventricle and the lower part of its lateral walls. Prominent among the structures composing the hypothalamus are the supraoptic nuclei, the paraventricular nuclei, and the mamillary bodies (Kevin T. Patton, 2013).

The hypothalamus plays a key role in maintaining homeostasis because it regulates many visceral activities. The following list summarizes the numerous functions of the hypothalamus are regulates and integrates the autonomic nervous system, regulates emotional response and behavior, regulates body temperature, regulates food intake, regulates water balance and thirst, regulates wake up cycles, and regulates endocrine system activity (Applegate, 2011).

f. Midbrain

The midbrain (*mesencephalon*) is appropriately named. It forms the midsection of the brain, because it lies above the pons and below the cerebrum. Both white matter (tracts) and reticular formation compose the midbrain. Extending divergently through it are two ropelike masses of white matter named cerebral peduncles. Tracts in the peduncles conduct impulses between the midbrain and cerebrum. In addition to the cerebral peduncles, another landmark of the midbrain is the corpora quadrigemina (Kevin T. Patton, 2013).

The functions of midbrain are for the reflex center of the eye and head movement, auditory relay pathway, and corticospinal tract pathway (Seidel, 2011).

2.1.1.2 Spinal Cord

The spinal cord is continous with the medulla oblongata above and constitutes the CNS below thw brain. It commences at the foramen magnum and terminates at the level of the first lumbar vertebra, it is approximately 45cm long. At its lower end, it tapers off into a conical shape called the conus medullaris, from the end of which the filum terminale descends to the coccyx, surrounded by nerve roots called the cauda equina (Watson, 2011).

Grossly, the spinal cord is divided into vertebral sections (8 cervicals, 12 thoracics, 5 lumbars, 5 sacrals, and 1 coccygeal) that correspond to paired nerves. A cross section of the spinal cord is characterized by a butterfly shaoed inner core of gray matter (containing nerve cell bodies) (Sue E & Kathryn I, 2012).

The spinal cord performs two general functions. Briefly, it provides conduction routes to and from the brain and serves as the integrator or reflex center for all spinal reflexes. Spinal cord tracts provide conduction paths to and from the brain. Ascending tracts conduct sensory impulses up the cord to the brain. Descending tracts conduct motor impulses down the cord from the brain. Bundles of axons compose all tracts (Kevin T. Patton, 2013).

2.1.2 Cranial Nerves

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.

2.1.2.1 Cranial nerve I (olfactory) : Sensory - smell reception and interpretation.

- 2.1.2.2 Cranial nerve II (optic) : Sensory visual acuity and visual fields.
- 2.1.2.3 Cranial nerve III (oculomotor) : Motor raise eyelids, most extraocular movements. Parasymphatetic pupillary constriction, change lense shape.
- 2.1.2.4 Cranial nerve IV (trochlear) : Motor downward, inward eye movement.
- 2.1.2.5 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.
- 2.1.2.6 Cranial nerve VI (abducens) : Motor lateral eye movement.
- 2.1.2.7 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.
- 2.1.2.8 Cranial nerve VIII (acoustic) : Sensory hearing and equilibrium.
- 2.1.2.9 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.
- 2.1.2.10 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.

- 2.1.2.11 Cranial nerve XI (accessory) : Motor turn head, shrug shoulders, some actions for phonation.
- 2.1.2.12 Cranial nerve XII (hypoglossal) : Motor tongue movement for speech sound articulation, and swallowing (Seidel, 2011).

2.2 Basic Concepts of Non Haemorrhagic Stroke

2.2.1 Definition

Stroke remains one of the most important causes of disability and death worldwide. Despite all the advances in the acute treatment of ischemic strokes, the proportion of patients who qualify for such medical and endovascular interventions is small and the outcomes are not good even for many who undergo acute therapies. The outcomes of hemorrhagic strokes are dismal, with mortality rates ranging from 30% to 40% and exceeding 50% for anticoagulant-related intracerebral hemorrhages (M. Edip et al, 2018).

Ischemic stroke is characterized by the sudden loss of blood circulation to an area of the brain, resulting in a corresponding loss of neurologic function. Acute ischemic stroke is caused by thrombotic or embolic occlusion of a cerebral artery and is more common than hemorrhagic stroke (Edward C, 2018).

Stroke disease or known as pelo disease is one of the diseases in the fear by the community. WHO data in 2015 indicates that stroke is the second leading cause of death after heart disease. On 2015, 6.24 million people worldwide died from stroke. 53.34% suffered a hemorrhagic stroke, and the remaining 46,66% had ischemic stroke (WHO, 2016).

Changes in blood vessel walls of the brain and other components can be primary because of congenital or degenerative disorders. In addition to the above mentioned, this pathology process can occur secondary to other processes, such as inflammation of arteriosclerosis, hypertension and diabetes mellitus. Therefore, the cause of stroke is very multifactorial (Goldzmidt, 2013).

From the definition above can be concluded stroke is a disease caused by impaired blood circulation in the brain that can occur with a sudden characterized by neurological disorders.

2.3 Etiology

The most common etiology of the stroke are (Jennifer P. Kowalak, 2011):

2.3.1 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.

2.3.2 Embolism

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

2.3.3 Hemorrhage

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

- 2.3.4 Hypertension
- 2.3.5 Family's history of stroke
- 2.3.6 History of Transient Ischemic Attack
- 2.3.7 Heart disease
- 2.3.8 Diabetic mellitus
- 2.3.9 Hyperlipidemia
- 2.3.10 Smoking
- 2.3.11 Alcoholic
- 2.3.12 Obesity and lifestyle
- 2.3.13 Contraceptive oral consumption

2.4 Sign and symptom

Symptom commonly appear in non hemorrhic stroke patients are (Mansjoer et al, 2008) :

- 2.4.1 Generally occurs suddenly, there is headache.
- 2.4.2 Parasthesia, paresis, plegia of some bodies.
- 2.4.3 Paralysis and loss or decrease in tendon reflexes.
- 2.4.4 Disphagia
- 2.4.5 Lost contact
- 2.4.6 Perceptual disorder
- 2.4.7 Changes in cognitive abilities and psychological effects
- 2.4.8 Bladder dysfunction

2.5 Pathophysiology

Ischemic stroke occurs due to blockage of blood vessels that cause blood flow to the brain partly or completely stopped. Blockage can occur due to accumulation of fat deposits containing cholesterol (plaque) in large blood vessels (carotid arteries) or small blood vessels (cerebral arteries) or small blood vessels. The thick blood will be stuck and clot (thrombosis), so the flow becomes slower. As a result the brain will experience a shortage of oxygen supply. If this delay in oxygen supply drags on, the brain tissue cells will die. When blood flow to the brain decreases from 24 to 30 ml / 100 g of brain tissue will occur ischemia, for blood supply less than 16ml / 100gr brain tissue / minute it will become infarct (Mansjoer et al, 2008).

2.6 Pathway



Picture 2.1 Pathway of Non Hemorrhagic Stroke Source: Kusuma, Hardhi 2013 & NANDA NIC-NOC 2015

2.7 Diagnostic Test

The diagnostic test of doagnostic findings are (Suzzane C Smeltzer, 2010) :

2.7.1 CT-scan Examination

Any client suspected of having a hemorrhage stroke should undergo CT scanning to determine the size and location of the hematoma as well as the presence or absence of ventricular blood and hydrocephalus. CT scan and cerebral angiography confirm the diagnosis of an intracranial aneurysm or AVM. These tests show the location and size of the lesion and provide information about the affected arteries, veins, adjoining vessels, and vascular branches.

2.7.2 Lumbar Puncture

Lumbar puncture is performed if there is no evidence of increased ICP, the CT scan results are negative, and subarachnoid hemorrhage must be confirmed. Lumbar puncture in the presence of increased ICP could result in brain stem herniation or rebleeding.

- 2.7.3 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

2.8 Management

- 2.8.1 The collaborative care for client with hemorrhage stroke are (Lewis, 2011):
 - 2.8.1.1 Drug Therapy

Anticoagulants and platelet inhibitors are contraindicated in client with hemorrhage strokes. The main drug therapy for client with hemorrhage stroke is the management of hypertension. Oral and IV agents may be used to maintain blood pressure within normal range. Seizure prophylaxis in the acute period after intracerebral and subarachnoid hemorrhages is recomended.

2.8.1.2 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. The treatment of AVM is surgical resection or radiosurgery.

2.8.1.3 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.

2.9 Nursing Care Concept

Nursing care is a the rapeutic processs that involves the cooperative relationship between the nurse with clients, families, or communities to a chieve optimal health status in providing nursing careby using the method swhich include nursing process: assessment, nursing diagnosis, planning, implementation and evaluation (Muttaqin, 2011).

2.9.1 Assessment

The basic concept of nursing care with hemorrhage stroke are :

2.9.1.1 The identity of the client.

Include: name, age, gender, status, race, religion, address, education, medical diagnosis, date of hospital admission, and the date of assessment was taken.

2.9.1.2 Main Complaint

Mostly the reason for the client ask for help is because limb weaknesson the half ofbody, loss of speech, unable to communicate, and decreased level of consciousness.

2.9.1.3 Health History of Current Disease

Mostly hemmorhage stroke attack the client was very sudden, it can happen when client did activity. Usually client felt headache, nausea, vomit, seizure and even unconsciouss in addition to the symptoms of paralysis a half of the body or brain damage. The decreaseor change in level of consciousness due to changes in intracranial. Complaints behavioral changes are also common. According to the development of the disease, can occurlethargy, unresponsive, andcoma.

2.9.1.4 Health History of Previous Disease

Any history of hypertension, diabetes mellitus, heart disease, anemia, a history of head trauma, use the oral contra ceptivesin thelong term, the use of anti-coagulant drugs, aspirin, vasodilators, drugs addictive and obesity.

Assessment of the drugs use that are commonly used by clients, such as the antihypertensives, antilipidemia, betablockers, and others. Any history ofsmoking, alcohol and the use of oral contraceptives. Assessment of this history can support the assessment of current disease and the basic data to further assessment and toprovidefur theractions.

2.9.1.5 Health History of Family Disease

There is usually a family history of hypertension, diabetes mellitus, or a history of stroke and previous generations.

2.9.1.6 Psychological Assessment

Psychological assessment of stroke in cludes several dimensions that allow nurse stoobta in a clear perception of the status of emotional, cognitive, andclient's behavioral. Assessment of coping mechanisms was used by client was also important to assess the client's emotional response to the disease and changes in the client's role in the family and society as well as the responses or influence in their daily lives, whether in the family or in the community. Is there any impact arising from the client that arise as the fear of anxiety, a sense of inability to perform activities optimally, and body image disturbance.

There is a changeof relationships and roles of client swhich isfind it difficult to communicate due to a speech disorder. Patterns of perception and self-concept show clients feel helpless, there is no hope, irritability, and uncooperative. In the pattern ofstress management, clients usually have difficulty to solve the problem because the thought process disturb and difficulty communicating. In the system of values and faith, clients perform spiritual worship rarely because of unstable behavior and weakness/ paralysison oneside of the body.

2.9.1.7 Physical Examination

a. Activity / Rest

Signs : Difficulty with activity due to weakness, loss sensation, or paralysis (hemiplegia). Tired easily and difficulty resting, pain or muscle twitching.

Symptom : Altered muscle tone (flaccid or spastic), generalized weakness, one side paralysis, and altered level of consciousness (LOC)

b. Circulatory

Signs : History of cardiac disease—myocardial infarction (MI), rheumatic and valvular heart disease, heart failure (HF), bacterial endocarditis, polycythemia

Symptom : Aterial hypertension which is common unless CVA is due to embolism or vascular malformation. Pulse rate may vary due to various factors, such as preexisting heart conditions, medications, effect of stroke on vasomotor center. Dysrhythmias, electrocardiographic (ECG) changes. Bruit in carotid, femoral, or iliac arteries, or abdominal aorta may or may not be present.

c. Ego Integrity

Signs : Feelings of helplessness, hopelessness.

Symptom : Emotional lability, exaggerated or inappropriate responses to anger, sadness, happiness and difficulty expressing self.

d. Elimination

Symptom : Change in voiding patterns—incontinence, anuria,distended abdomen, distended bladder. May have absent or diminshed bowel sounds if neurogenic paralytic ileus present.

e. Food/ Fluid

Signs : History of diabetes, elevated serum lipids (risk factors),lack of appetite, nausea or vomiting during acute event (increased intracranial pressure [ICP]), dysphagia, loss of sensation in tongue, cheek, and throat.

Symptom : Obesity (risk factor), chewing and swallowing problems.

f. Neurosensory

Signs : History of TIA, RIND, dizziness or syncope before stroke or transient during TIA, severe headache subarachnoid can accompany intracerebral or hemorrhage, tingling, numbness, and weakness commonly reported during TIAs, found in varying degrees in other types of stroke; involved side seems "dead". Visual deficits-blurred vision, partial loss of vision (monocular blindness), double vision (diplopia), or other disturbances in visual fields. Sensory loss on contralateral side in extremities and sometimes in

ipsilateral side of face. Disturbance in senses of taste, smell.

Symptom : Mental status/LOC: Coma usually presents in the initial stages of hemorrhagic disturbances; consciousness is usually preserved when the etiology is thrombotic in nature. Altered behavior-lethargy, apathy, combativeness. Altered cognitive functionmemory, problem-solving, sequencing. Extremities: Weakness and paralysis contralateral with all kinds of stroke; unequal hand grasp; diminished deep tendon reflexes (contralateral). Facial paralysis or paresis (ipsilateral). Aphasia: May be expressive (difficulty producing speech), receptive (difficulty comprehending speech), or global (combination of the two), agnosia, altered body image awareness, neglect or denial of contralateral of body (unilateral side neglect); disturbances in perception, apraxia. Pupil size and reaction: May be unequal; dilated and fixed pupil on the ipsilateral side may be present with hemorrhage or herniation, nuchal rigidity-common in hemorrhagic stroke and seizures—common in hemorrhagic stroke.

g. Pain/ Discomfort

Signs : Headache of varying intensity Symptom : Guarding, distraction behaviors, restlessness

and muscle or facial tension

h. Respiration

Signs : Smoking (risk factors)

Symptom : Inability to swallow, cough, or protect airway, labored and irregular respirations. Noisy respirations, rhonchi (aspiration of secretions).

2.9.8.8 Cranial nerve asessment

The procedure for cranial nerve examination are (Seidel, 2011):

- a. Cranial nerve I (olfactory) : Test ability to identify familiar aromatic odor, one naris at a time with eyes closed.
- b. Cranial nerve II (optic) : Test vision with Snellen chart and Rosenbaum near vision chart.
- c. Cranial nerve III (oculomotor), cranial nerve IV (trochlear), cranial nerve VI (abducens) : Test visual aids by confrontation and extinction of vision. Inspect eyelids for drooping. Inspect pupil's size for equality and their direct and consensual response to light and accomodation. Test extraocular eye movements.
- d. Cranial nerve V (trigeminal) : Inspect face for muscle atrophy and tremors. Palpate jaw muscles for tone and strength when patient clenches teeth. Test superficial pain and touch sensation in each branch (test temperature sensation if there are unexpected findings to pain or touch).
- e. Cranial nerve VII (facial) : Inspect symmetry of facial features with various expressions (example : smile, frown, puffed, cheeks, wrinkled forehead).
- f. Cranial nerve VIII (acoustic) : Test sense of hearing with whisper screening test or by audiometry.
- g. Cranial nerve IX (glossopharyngeal), cranial nerve X (vagus): Test ability to identify sour and bitter taste. Test gag reflex and ability to swallow. Inspect papalte and uvula for symmetry with speech sounds and gag reflex. Observe for swallowing difficulty. Evaluate quality of guttural speech sounds (presence of nasal or hoarse quality to voice).

- h. Cranial nerve XI (accessory) : Test trapezius muscle strength (shrug ahoulders against resistance). Test sternocleidomastoid muscle strength (turn head to each side against resistance).
- Cranial nerve XII (hypoglossal) : Inspect tongue in mouth and while protruded for symmetry, tremors, and atrophy. Inspect tongue movement toward nose and chin. Test tongue strength with index finger when tongue is pressed against cheek. Evaluate quality of lingual speech sounds.

2.9.1.9 Analysis of data

The collected data must be analyzed to determine theclient's problem. Data analysis is an intellectual process swhich includes grouping the data, identifing gaps and determining the pattern of the data collected and compare the composition or groups of data with a standard normal values, interpreting the data and ultimately make conclusions. The results of the analysis are nursing problem statement (Muttaqin, 2011).

- 2.9.2 Nursing Diagnosis
 - 2.9.2.1 The risk of increased ICT is related to the addition of brain contents secondary to cerebral hemorrhage.
 - 2.9.2.2 Physical Mobility Disorder Associated With Hemiparese / Hemiplegia
 - 2.9.2.3 The deficit of self-care is associated with weakness and paralysis.
 - 2.9.2.4 Nutritional disorders (less than body requirements) are associated with difficulty swallowing (dysphagia), hemiparese and hemiplegi.

- 2.9.2.5 Alfi incontinence is associated with impaired mobility and neurological damage.
- 2.9.2.6 Damage to verbal communication is related to the effects of damage to the speech area of the brain hemisphere, loss of facial or oral muscle tone, and general weakness (Muttaqin, 2011).

2.9.3 Nursing Intervention

The nursing plans of the above nursing diagnoses are (Muttaqin, 2011):

2.9.3.1 Typical Raising Risk Associated With Addition of Secondary Brain Contents Against Hypoxia, Brain Edema.

Aim : After the client's nursing action does not experience an increase in intra-cranial pressure.

Results criteria:

There is no sign of increased intra-cranial pressure:

- a. Increased blood pressure.
- b. The pulse widens.
- c. Breathing cheyne stokes
- d. Projectile vomiting.
- e. Great headache.

ICT Prevention is on the rise.

 Table 2.1 Nursing Intervention

INTERVENTION	RATIONAL
Monitor signs and symptoms of increased ICT	Early detection of ICT improvement
blood pressure	to take further action.
• pulse	
• GCS	
Respiration	
Complaints headache is great	
• Projectile vomiting	

Unilateral pupils	
Elevate the head of the bed 15-30 degrees unless	Raising the head may help vein
there is contra indication. Avoid changing position	drainage to reduce venous
quickly.	congestion.
Avoid the following:	The carotid masses slow the heart
Carotid Massage	rate and reduce the systemic
	circulation followed by sudden
	increase in circulation.
Flexion of the neck or rotation> 45 degrees.	Flexion or rotation of the extremes of
	the neck disrupts cerebrospinal fluid
	and venous drainage of the intra-
	cranial cavity.
Anal stimulation with the fingers (may but	
carefully) avoid straining, extreme flexion of the	This activity results in a valsalva
pelvis and knees.	maneuver that damages venous
	return with jugular venous con- tract
	and increased ICT.
Consul doctor to get stool softeners if needed.	Prevents constipation and straining
	that leads to valsalva maneuvers.
Keep the environment calm, quiet and dim	Increasing rest and decreasing
lighting.	stimulation helps lower ICT.
Give medicine on order:	Lowering blood pressure.
• Anti hypertension.	Prevent the occurrence of
• Anti coagulant.	thrombus.
• Intra venous therapy of fluid replacement	Prevent fluid deficit.
and electrolyte.	Prevent obstipation.
• Stool softeners.	• Prevent ulcer stress.
• Anti ulcer.	Increase endurance.
Roborantia.	Reduce pain.
• Analgetics.	

Source: Muttaqin (2011)

- 2.9.3.2 Physical Mobility Disorder Associated With Hemiparese / Hemiplegia
 - Aim: Client able to carry out physical activity in accordance with its ability

Results criteria:

- a. No joint contractures occur
- b. Increased muscle strength
- c. Client shows action to improve mobility

INTERVENTION	RATIONAL
• Change the client's position	• Reduced risk of tissue ischemia due to
every 2 hours	bad blood circulation in the depressed
• Teach clients to exercise active	region
motion on the extremities that	• The active movement gives mass, tone
are not sick	and muscle strength as well as improves
• Perform passive movement on	heart and breathing function
sick extremities	• Voluntary muscle will lose its tone and
• Give the extremity footboard in	strength if not trained to move
its functional position	
• Elevate the head and hands	
• Collaboration with	
physiotherapists for the client's	
physical exercise	

Table 2.2 Nursing Intervention

Source: Muttaqin (2011)

2.9.3.3 The deficit of self-care is associated with weakness and paralysis.

Aim: The client's self-care needs are met

Criteria results :

a. Client can perform self care activities according to client's ability.

b. Clients can identify personal sources / communities to provide assistance as needed.

Table 2.3	Nursing	Intervention
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INTERVENTION	RATIONAL
• Determine the ability and the level	• Assist in anticipating / planning
of deficiency in self-care.	the fulfillment of individual needs
• Give motivation to the client to	• Increase self-esteem and passion
keep doing activities and give help	to strive constantly
with the attitude really	• Clients may become very
• Avoid doing things for clients that	frightened and highly dependent
clients can do themselves, but	and although the help provided is
provide assistance as needed.	beneficial in preventing
• Provide positive feedback for every	frustration, it is important for the
effort it does or its success	client to do as much as possible
• Collaboration with a	for himself to maintain self-esteem
physiotherapist / occupational	and improve recovery
	• Enhance feelings of self-meaning
	and independence and encourage
	clients to strive continuously
	• Provide steady assistance to
	develop a therapeutic plan and
	identify the needs of a special
	support tool

Source: Muttaqin (2011)

- 2.9.3.4 Nutritional disorders (less than body requirements) are associated with difficulty swallowing (dysphagia), hemiparese and hemiplegi.
 Aim: No nutritional disorders
 Criteria results :
 - a. Weight gain can be maintained / enhanced
 - b. Hb and albumin within normal limits

INTERVENTION	RATIONAL
• Determine the client's ability to	• To establish the type of food that
chew, swallow and reflex cough	will be given to the client
• Place the head position higher on	• For clients it is easier to swallow
time, during and after meals	because of the force of gravity
• Stimulate the lips to close and open	• Assist in retraining sensory and
the mouth manually by pressing	improving muscular control
lightly on the lips / under the chin	• Provide sensory stimulation
if needed	(including the taste of soy sauce)
• Put food on the area of the mouth	that can trigger attempts to
is not disturbed	swallow and increase input
• Give food with a run in a quiet	• Clients can concentrate on eating
environment	mechanisms in the absence of
• Begin to provide half-liquid	external distraction / interference
peroral feed, eat soft when the	• Eating soft / viscous liquid is easy
client can swallow water	to control it in the mouth,
• Encourage clients to use drinking	decreasing aspiration
straws	• Strengthens facial muscles and
• Encourage clients to participate in	swallowing muscles and decreases
an exercise / activity program.	the risk of choking
• Collaborate with a team of doctors	• Can increase the release of
to provide ciran through iv or food	endorphins in the brain that
through the hose	increase appetite
	• It may be necessary to provide
	replacement fluids as well as food
	if the client is unable to put
	everything through the mouth
Source: Muttaqin (2011)	

Table 2.4 Nursing Intervention

2.9.3.5 Alfi incontinence is associated with impaired mobility and neurological damage.

Aim: hours of fulfillment of alfi elimination fulfilled.

Criteria Results: the client can defecate spontaneously and smoothly without using the drug, consistency of soft shaped feces, not palpable mass on the colon (scibala).

INTERVENTION	RATIONAL
• Explain the client and patient's	• Client and family will understand
family about the cause of	the cause of constipation.
constipation.	• Bowel sounds indicates the nature
• Auscultation bowel sounds	of peristaltic activity.
• Encourage clients to eat fiber-rich	• A balanced diet high in fiber
foods.	content and regular elimination of
• If the client is able to drink, provide	peristalti and elimination.
adequate fluid intake (2L / day) if	• Adequate fluid input helps
there is no contraindication.	maintain consistency of the bowel
• Mobilize according to client's	stool and helps with regular
circumstances.	elimination.
• Collaboration with the team of	• Regular physical activity helps
doctors in the provision of faces	elimination by improving
softeners (laxatives, suppositories,	abdominal muscle tone and
enemas)	stimulating appetite and peristalsis.
	• Fecal softeners improve the
	efficiency of intestinal water
	wetting, which softens the mass of
	the stool and helps eliminate it.

Table 2.5 Nursing Intervention

Source: Muttaqin (2011)

- 2.9.3.6 Damage to verbal communication is related to the effects of damage to the speech area of the brain hemisphere, loss of facial or oral muscle tone, and general weakness.
 - Aim: clients can demonstrate understanding of communication problems, able to communicate their feelings, able to use sign language.

Results Criteria: The creation of a communication where client needs can be met, the client can respond verbally and gesture.

INTERVENTION	RATIONAL
• Assess the type of dysfunction eg	• Helps determine the damage to
the client does not understand	the area of the brain and
words or problems speaking or do	determine the difficulty of the
not understand the language used.	client with some or all of the
• Distinguish aphasia with	communication process, the
dysperria.	client may have problems in
• Do a good and complete	deciphering words.
conversation method, give the	• Can determine pilihat
client's sincerity to clarify.	interventions appropriate to the
• Say to follow the command	type of disorder.
simply as close your eyes and	• The client may lose the ability
look to the door.	to monitor his speech, his
• Speak directly to the client	communication unconsciously,
speaking slowly and tengan, use	by supplementing to realize the
questions that answer "no" and	client's understanding and to
"yes" and note the client's	clarify the conversation.
response.	• To follow receptive aphasia.
• Collaboration: consultation with	• Reduce confusion or anxiety
speech therapist.	about the amount of
	information. Advancing the
	communication stimulation of
	memories and words.
	• Assess individual and sensory
	motor abilities and cognitive
	function to identify deficits and
	therapeutic needs.

Table 2.6 Nursing Intervention

Source: Muttaqin (2011)

2.9.4 Evaluation

Expected results after nursing orders include (Muttaqin, 2008):

- 2.9.4.1 Indicates an increase in respiratory status.
 - a. Arterial blood gas with acceptable range.
 - b. No crackles.
 - c. Overcoming secretions without aspiration.
- 2.9.4.2 Demonstrate the integrity of the skin adequately.
 - a. Comply with schedule change position.
 - b. Whole skin without proof decubitus.
- 2.9.4.3 Demonstrate joint mobility improvement.
 - a. Participation exercises range of motion.
 - b. Using the tools.
 - c. Does not show any contractures.
- 2.9.4.4 Participate in self-care activities within its limitations.
 - a. Compensate for the limitations.
 - b. Identify goals for self-care.
- 2.9.4.5 No pain.
- 2.9.4.6 Achieving adequate nutritional intake.
 - a. Maintain weight.
 - b. Shows a safe feeding method.
- 2.9.4.7 Shows increased control of bowel and bladder function.
 - a. Actively participate in intestinal and bladder management programs.
 - b. It does not often have bowel and bladder incontinence.
- 2.9.4.8 Showing such cognitive function before illness.
 - a. Showing awareness into cognitive limitations.
 - b. Using an alternative approach to compensate for cognitive function.
- 2.9.4.9 Reveals the ability to participate in sexual relationships.
- 2.9.4.10 Demonstrate the effective use of coping skills.