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## Chapter

# Key Points of Nursing Care for Patients with Acute Stroke

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## Abstract

In patients with stroke, it has been proven that management by a specialized medical team for stroke treatment for several days immediately after stroke onset significantly reduces mortality, improves return-to-home rates, and positively impacts activities of daily living and quality of life after discharge. This chapter describes the key points of nursing care for patients with acute stroke, which include “Recognition of patients’ physical changes,” “Prevention of the worsening of acute stroke and related Symptoms,” “Reduction of patients’ physical distress,” “Appropriate management of patients’ physical conditions,” “Reacquisition of activities of daily living,” “Collaboration with rehabilitation therapists,” “Reduction of mental and social distress in patients and their families,” and “Reduction of the risk of recurrence and requirement of discharge support.” These points will have a positive impact on patients with stroke by improving the nurses’ competence to practice nursing and enhancing the quality of team care.

**Keywords:** key points, nursing care, roles, patients with acute stroke, interdisciplinary collaboration

## 1. Introduction

In patients with stroke, it has been proven that management by a specialized medical team for stroke treatment for several days immediately after stroke onset significantly reduces mortality, improves return-to-home rates, and positively impacts activities of daily living and quality of life after discharge [1–3]. The team includes physicians, nurses, physical therapists, occupational therapists, speech therapists, clinical technologists, pharmacists, nutritionists, and medical social workers. Team care—in which all of these professions work together by contributing their expertise—is highly effective in delivering treatment. Therefore, it is necessary to clarify the role of nurses and key points of nursing care within the stroke support team.

In this chapter, we first report the results of a questionnaire survey of nurses working in SCUs (Stroke Care Units) that provide nursing care to patients with acute stroke in Japan, to determine what kind of nursing care they believe is necessary for patients with acute stroke. Based on this survey, critical nursing care for patients with acute stroke was divided into the following eight categories: “Recognition

of patients' physical changes," "Prevention of the worsening of acute stroke and related Symptoms," "Reduction of patients' physical distress," "Appropriate management of patients' physical conditions," "Reacquisition of activities of daily living," "Collaboration with rehabilitation therapists," "Reduction of mental and social distress in patients and their families," and "Reduction of the risk of recurrence and requirement of discharge support."

For each of these eight categories, the key points of nursing care for patients with acute stroke will be explained, taking into account differences by pathological type (cerebral hemorrhage, subarachnoid hemorrhage, cerebral infarction, etc.), severity, site of injury, and time since the onset of stroke.

## 2. What is nursing care for patients with acute stroke?

The collaboration between neurosurgeons and certified stroke nurses has resulted in the development of 52 key points of nursing care for patients with acute stroke. A web-based survey was conducted among 1040 nurses working in SCUs managing patients with acute stroke in Japan, who responded to each of the 52 points of nursing care using a 5-point scale (5. very important, 4. somewhat important, 3. undecided, 2. not very important, 1. not important at all). The responses of 702 respondents, excluding results with missing values, were included in the analysis. A summary of the subjects is shown in **Table 1**.

Characteristics	Frequency (n)	Percentage (%)
Age		
20–29	312	44.2
30–39	179	25.4
40–49	157	22.2
50 years old and above	58	8.2
Gender		
Female	631	89.4
Male	75	10.6
Years of experience as a nurse		
0–3	148	21.0
4–5	105	14.9
6–10	173	24.5
11–20	167	23.7
21 years and above	113	16.0
Years of experiences taking care for patient with acute stroke		
0–3	333	47.2
4–5	28	4.0
6–10	124	17.6
11–20	145	20.5
21 years and above	76	10.8

Characteristics	Frequency (n)	Percentage (%)
Position		
Nursing manager	67	9.5
Staff nurse	639	90.5
Qualified as a specialist		
Certified nurse specialist	36	5.1
General nurse	670	94.9
Hospital number of beds		
0–99	62	8.8
100–399	297	42.1
400–699	232	32.9
700 beds and above	115	16.3
Number of beds in Stroke Care Unit		
1–9	449	63.6
10 beds and above	257	36.4

**Table 1.**  
Participants' demographic characteristics (N = 706).

Question number and items (N = 706)	Mean	SD
Q1 Should grasp the severity of stroke	4.85	0.37
Q2 Should grasp the treatment progress from the onset of stroke	4.87	0.35
Q3 Should recognize the need for treatment in patients with acute stroke	4.93	0.25
Q4 Should recognize the changes in intracranial hypertension due to stroke	4.94	0.25
Q5 Should recognize the changes in consciousness disorder due to stroke	4.97	0.17
Q6 Should recognize changes in the motor dysfunction due to stroke	4.94	0.23
Q7 Should grasp the changes in sensory dysfunction due to stroke	4.78	0.42
Q8 Should grasp the changes in swallowing dysfunction due to stroke	4.90	0.30
Q9 Should grasp the changes in eye symptoms (pupil diameter, light reflex, eye movement) due to stroke	4.91	0.29
Q10 Should grasp the changes in higher brain dysfunction due to stroke	4.78	0.42
Q11 Should recognize the changes in the general condition of patients with acute stroke	4.94	0.24
Q12 Should grasp the exacerbation risk in patients with acute stroke	4.91	0.28
Q13 Should report changes in the disease state of patients with acute stroke to physicians at the appropriate time	4.97	0.18
Q14 Should provide nursing care to prevent exacerbation of intracranial hypertension in patients with acute stroke	4.92	0.29
Q15 Should provide nursing care to prevent sudden changes in the circulatory dynamics of patients with acute stroke	4.88	0.34
Q16 Should provide nursing care to prevent respiratory complications in patients with acute stroke	4.90	0.31

Question number and items (N = 706)		Mean	SD
Q17	Should ensure that patients with acute stroke receive appropriate treatment from physicians	4.94	0.24
Q18	Should provide nursing care to patients with acute stroke to avoid the risk of secondary complications due to restricted movement	4.85	0.37
Q19	Should provide nursing care to ensure optimal nutrition and fluid intake in patients with acute stroke	4.84	0.39
Q20	Should provide nursing care to patients with acute stroke to avoid the risk of physical injury and to ensure safe medical treatment	4.83	0.40
Q21	Should try to recognize the distress caused to patients with acute stroke as they are unable to communicate to others	4.86	0.37
Q22	Should make attempts to reduce pain due to physical changes caused by a stroke	4.86	0.35
Q23	Should provide nursing care to patients with acute stroke to minimize physical distress through treatment and care	4.85	0.37
Q24	Should defend the human rights of patients with acute stroke who cannot communicate their own desires	4.85	0.41
Q25	Should coordinate with physical therapists, occupational therapists, and speech therapists (hereinafter therapists) in order for patients with acute stroke to be able to receive training/exercise effectively	4.83	0.39
Q26	Should know the details of training/exercises for patients with acute stroke guided by the therapists	4.53	0.59
Q27	Should recognize the maximum physical ability of patients with acute stroke during training/exercise guided by the therapists	4.54	0.61
Q28	Should communicate to therapists about changes in patients with acute stroke that affect their training/exercise	4.76	0.46
Q29	Should facilitate not only therapist-guided training/exercise but also provide training/exercise by nurses	4.46	0.69
Q30	Should provide nursing care to patients with acute stroke to promote their recovery	4.79	0.46
Q31	Should provide nursing care to patients with acute stroke for better sleep and rest	4.82	0.41
Q32	Should provide nursing care to improve consciousness disorder in patients with acute stroke	4.70	0.54
Q33	Should recognize assistance needs and the levels of ADL in patients with acute stroke	4.86	0.35
Q34	Should detect dysfunction-affecting ADL in patients with acute stroke	4.84	0.38
Q35	Should provide nursing care to help patients with acute stroke to regain their ADL	4.82	0.40
Q36	Should help patients with acute stroke to perform ADL by themselves	4.71	0.53
Q37	Should try grasping the mental distress of patients with acute stroke	4.81	0.41
Q38	Should try to recognize the social distress in patients with acute stroke	4.64	0.56
Q39	Should recognize the mental distress in the family of patients with acute stroke	4.75	0.48

Question number and items (N = 706)	Mean	SD
Q40 Should recognize the need for family support in patients with acute stroke	4.71	0.53
Q41 Should provide nursing care to reduce mental distress in patients with acute stroke	4.79	0.44
Q42 Should provide nursing care to help patients with acute stroke accept their disabilities	4.79	0.45
Q43 Should provide nursing care to help patients with acute stroke that enables them to feel positive	4.74	0.50
Q44 Should provide nursing care for family-related mental distress in patients with acute stroke	4.72	0.51
Q45 Should provide nursing care for the need for family support in patients with acute stroke	4.62	0.60
Q46 Should recognize the medical history and lifestyle risk factors for the onset of stroke in patients with acute stroke	4.85	0.37
Q47 Should explain the risk of recurrence to patients with acute stroke	4.82	0.47
Q48 Should teach patients with acute stroke about lifestyle changes after hospital discharge to avoid the risk of recurrence	4.85	0.40
Q49 Should provide nursing care and guidance to patients with acute stroke (and their families if patient family support is needed in post-discharge life) to avoid the risk of recurrence	4.85	0.41
Q50 Should share the prognosis of patients with acute stroke with other healthcare providers	4.76	0.49
Q51 Should provide nursing care to facilitate the transfer of patients with acute stroke to the hospital	4.77	0.48
Q52 Should provide nursing care to facilitate hospital discharge of patients with acute stroke	4.79	0.47

**Table 2.**  
*Perception of the importance of nursing for patients with acute stroke.*

**Table 2** shows the results of the survey on the perceived needs for the 52 points of nursing care for patients with acute stroke. The mean of responses to all 52 points of nursing care for patients with acute stroke, which were developed independently, was 4.5 or higher out of 5. The items “Should recognize the changes in consciousness disorder due to stroke” and “Should report changes in the disease state of patients with acute stroke to physicians at the appropriate time” averaged 4.97. The items “Should recognize the changes in intracranial hypertension due to stroke,” “Should recognize changes in the motor dysfunction due to stroke,” “Should recognize the changes in the general condition of patients with acute stroke,” and “Should ensure that patients with acute stroke receive appropriate treatment from physicians” had an average value of 4.94. The point of nursing care for these patients with acute stroke was found to be particularly important.

**Table 3** shows the names of the eight categories of the exploratory factor analysis. The critical nursing care points included in each category are presented [4]. A conceptual diagram of nursing care for patients with acute stroke is shown in **Figure 1**.

## Stroke - Management Pearls

Recognition of patients' physical changes	Should recognize the changes in consciousness disorder due to stroke
	Should report changes in the disease state of patients with acute stroke to physicians at the appropriate time
	Should recognize changes in the motor dysfunction due to stroke
	Should recognize the changes in the general condition of patients with acute stroke
	Should recognize the need for treatment in patients with acute stroke
Prevention of the worsening of acute stroke and related symptoms	Should recognize the changes in intracranial hypertension due to stroke
	Should provide nursing care to prevent sudden changes in the circulatory dynamics of patients with acute stroke
	Should provide nursing care to prevent exacerbation of intracranial hypertension in patients with acute stroke
Reduction of patients' physical distress	Should provide nursing care to prevent respiratory complications in patients with acute stroke
	Should make attempts to reduce pain due to physical changes caused by a stroke
	Should try to recognize the distress caused to patients with acute stroke as they are unable to communicate to others
Appropriate management of patients' physical conditions	Should provide nursing care to patients with acute stroke to minimize physical distress through treatment and care
	Should provide nursing care to patients with acute stroke to avoid the risk of secondary complications due to restricted movement
	Should provide nursing care to ensure optimal nutrition and fluid intake in patients with acute stroke
Reacquisition of activities of daily living	Should provide nursing care to patients with acute stroke to avoid the risk of physical injury and to ensure safe medical treatment
	Should ensure that patients with acute stroke receive appropriate treatment from physicians
	Should recognize assistance needs and the levels of ADL in patients with acute stroke
	Should detect dysfunction-affecting ADL in patients with acute stroke
	Should provide nursing care to help patients with acute stroke to regain their ADL
	Should provide nursing care to patients with acute stroke for better sleep and rest
	Should provide nursing care to improve consciousness disorder in patients with acute stroke
Should provide nursing care to patients with acute stroke to promote their recovery	
Collaboration with rehabilitation therapists	Should help patients with acute stroke to perform ADL by themselves
	Should recognize the medical history and lifestyle risk factors for the onset of stroke in patients with acute stroke
	Should recognize the maximum physical ability of patients with acute stroke during training/exercise guided by the therapists
	Should know the details of training/exercises for patients with acute stroke guided by the therapists
Reduction of mental and social distress in patients and their families	Should communicate to therapists about changes in patients with acute stroke that affect their training/exercise
	Should facilitate not only therapist-guided training/exercise but also provide training/exercise by nurses
	Should provide nursing care for family-related mental distress in patients with acute stroke
	Should recognize the need for family support in patients with acute stroke
	Should provide nursing care for the need for family support in patients with acute stroke
Reduction of mental and social distress in patients and their families	Should recognize the mental distress in the family of patients with acute stroke
	Should try to recognize the social distress in patients with acute stroke

Reduction of the risk of recurrence and requirement of discharge support	Should teach patients with acute stroke about lifestyle changes after hospital discharge to avoid the risk of recurrence
	Should provide nursing care and guidance to patients with acute stroke (and their families if patient family support is needed in post discharge life) to avoid the risk of recurrence
	Should explain the risk of recurrence to patients with acute stroke
	Should provide nursing care to facilitate the transfer of patients with acute stroke to the hospital
	Should provide nursing care to facilitate hospital discharge of patients with acute stroke
	Should share the prognosis of patients with acute stroke with other healthcare providers

**Table 3.**  
Result of exploratory factor analysis of the perception of the need for nursing for patients with acute stroke scale (excerpt from Ref. [4]).



**Figure 1.**  
Conceptual diagram of nursing care for patients with acute stroke.

### 3. Key points for nursing care for patients with acute stroke

#### 3.1 Recognition of patients' physical changes

“Recognition of patients’ physical changes” refers to nursing care to identify changes in general condition and neurological signs due to the onset of stroke and report them to the physician when appropriate.



Patients with cerebral infarction are particularly prone to reinfarction during the acute phase. In addition, when there is extensive cortical damage, cerebral edema may occur, resulting in increased intracranial pressure. Intracranial hemorrhage may also occur following reopening of arterial blood flow in the acute phase with thrombolytic therapy or mechanical thrombus retrieval therapy. Nurses must detect early signs of worsening neurological symptoms or changes in circulatory dynamics due to reinfarction or other causes and report them to the physician. In Japan, periodic evaluation of the degree of consciousness impairment using the Glasgow Coma Scale or the Japan Coma Scale is mandatory. Moreover, the degree of paralysis, sensory deficits, aphasia, and other higher functions, as well as respiratory and circulatory parameters such as blood pressure, respiration, and SaO<sub>2</sub>, are often observed over time. The nurses should determine the observation items and timing, taking into consideration the severity of the patient's illness, the number of days since the onset, the site of injury, and the symptoms present. The nurses should also properly evaluate the observations, determine exactly what findings, if any, are likely to worsen the patient's life expectancy or neurological function, and report them to the physician in a timely manner.

Patients with cerebral hemorrhage are at high risk of rebleeding during the acute phase, and rebleeding leads to exacerbation of increased intracranial pressure. In particular, in the case of brainstem and cerebellar hemorrhage, even a relatively small amount of bleeding can be directly life-threatening. When ventricular drainage is used to manage hydrocephalus, physical changes, cerebrospinal fluid pressure, and the amount and nature of drainage fluid should be monitored in combination.

Patients with subarachnoid hemorrhage are at particular risk for rerupture in the time between onset and treatment procedures such as clipping or coil embolization to prevent rupture. Nurses should observe not only for signs of rerupture, but also for elevated blood pressure, pain, and stress, which are risk factors for rerupture. The first two weeks after onset are considered to be the most likely time for stroke due to delayed cerebral vasospasm. During this period, neurological signs should be monitored over time for deterioration and early detection of decreased cerebral blood flow.

The nurses decide what signs should be monitored, taking into consideration the patient's disease type, location of brain injury, severity, treatment, current symptoms, and the number of days since onset and progress. Furthermore, the nurses are responsible for analyzing the assessment data and reporting to the physician if further examination or treatment is needed.

### 3.2 Prevention of the worsening of acute stroke and related symptoms

**“Prevention of the worsening of acute stroke and related symptoms” refers to nursing care that avoids increased intracranial pressure, sudden changes in circulatory dynamics, and respiratory complications.**

For the acute stroke patient, the most important nursing care aimed at avoiding critical illness is to prevent cerebral herniation due to intracranial hypertension. The first step is the early detection of signs of intracranial hypertension. Patients at high risk for cerebral edema and rebleeding are also at high risk for cerebral herniation. The nurses should detect signs of intracranial hypertension, such as headache, nausea, and vomiting, changes in the level of consciousness, differences in pupil diameter and size, changes in blood pressure, widening of pulse pressure, bradycardia, changes in breathing patterns, and increased body temperature. When the nurses detect signs of cerebral herniation, they should immediately report it to the physician and assist the physician in quickly alleviating the increased intracranial pressure.

Some reports indicate that raising the head position to 15–30 degrees is effective when intracranial pressure is elevated [5]. The nurses should ensure that the patient is in the most appropriate position, without increasing intracranial pressure, with minimal pain, and with an integrated assessment of the risk of pressure ulcers and prevention of respiratory complications. During this period, it is important to keep the patient comfortable, with appropriate blood pressure control, and to avoid stimulation and minimize physical and emotional stress.

Physiological monitoring has been reported to be effective in patients with acute stroke [6]. Nurses continuously monitor blood pressure and electrocardiograms in patients with acute stroke. Unlike patient management in general diseases, the Japanese Stroke Treatment Guidelines 2021 [7] recommend that hypertension in patients with acute cerebral infarction should not be lowered as much as possible. It states that prudent antihypertensive therapy should be used only when systolic blood pressure > 220 mmHg or diastolic blood pressure > 120 mmHg is sustained. For blood pressure management of patients with acute cerebral hemorrhage, the authors recommend lowering systolic blood pressure to <140 mmHg. Blood pressure control in patients with subarachnoid hemorrhage varies before and after surgical treatment of a ruptured aneurysm and requires strict individualized blood pressure control. After surgery, blood pressure is often maintained and elevated to prevent or treat cerebral vasospasm. The nurses ensure that the appropriate blood pressure for each type of stroke is maintained. The nurses promptly report any deviation from the appropriate blood pressure to the physician or adjusts medications, as previously ordered by the physician, to control the blood pressure. The nurses must also provide assistance with daily activities and aid in encouraging the patient to sit or stand at bedside, while preventing sudden blood pressure changes.

Many patients with acute stroke develop respiratory infections, such as pneumonia resulting in serious illness [8]. Nurses must perform continuous monitoring of respiratory status in patients with acute stroke. It is critical that nurses provide positioning, swallowing training, oral care, and early initiation of physical activity to prevent aspiration and avoid complications such as respiratory infections [9].

### **3.3 Reduction of patients' physical distress**

**“Reduction of patients' physical distress” refers to nursing care aimed at identifying and reducing physical distress associated with physical changes and treatment due to stroke.**

Stroke patients experience physical pain, such as the inability to move themselves as they did before the onset of the stroke, as well as numbness and pain in the extremities due to sensory disturbance. Other symptoms may include headache, nausea, and vertigo. Headache occurs in 28% of patients with acute stroke [10]. Dizziness is more common in stroke patients with foci in the cerebellum or brainstem. Patients with acute stroke experience these distresses suddenly. These physical distresses further interfere with sleep and rest and increase mental anxiety. Nurses need to alleviate physical pain as much as possible with pharmacologic and nonpharmacologic nursing care. In addition, stroke patients often suffer from aphasia and impaired consciousness [11] and may not be able to communicate their distress to others. Nurses must anticipate what kind of physical pain the patient may experience depending on the location of the brain injury and the pathological condition.

Some treatments, tests, and nursing care provided for patients with acute stroke cause physical distress. For example, frequent and unnecessary monitoring also

interfere with sleep. Restricting patient activities for the sake of patient safety can also cause distress. Nurses should provide nursing care with the utmost prudence to ensure patient safety and avoid causing patient distress. Nurses must be keen in addressing physical distress such as sensory disturbance and impaired communication while ensuring comfort and safety.

### **3.4 Appropriate management of patients' physical conditions**

**“Appropriate management of patients' physical conditions” refers to nursing care that aims to avoid complications secondary to immobility and to ensure adequate nutrition and fluid intake.**

Patients in the acute phase of stroke are often immobile due to impaired consciousness or impaired motor function. Some of their activities are restricted as part of the treatment to prevent sudden intracranial pressure changes. They are prone to disuse syndrome, which is a functional decline in the musculoskeletal, respiratory/circulatory, and psychoneurotic systems. Starting rehabilitation early after the onset of patients with acute stroke can prevent disuse syndrome, but the acute phase of stroke is unstable and requires adequate risk management. Nurses need to observe patients for progression or recurrence of the primary disease condition, detect changes in respiratory and circulatory dynamics, and collaborate with therapists and physicians to safely provide rehabilitation. Therapies may include early initiation of physical activity and self-care training.

Nurses should also implement safety without overloading the patient, such as in the prevention of deep vein thrombosis, aspiration pneumonia, bedsores, and joint contractures, especially when the patient's condition is unstable and aggressive rehabilitation cannot be initiated.

Patients with acute stroke with impaired consciousness, dysphagia, or unstable vital signs are more likely to have poor nutritional status because they are unable to take food and fluids orally [12]. Patients with acute stroke with poor nutritional status are likely to have a poor outcome [13]. Therefore, swallowing evaluation and training should be performed early in the course of illness to initiate oral intake. In Japan, swallowing evaluation and training are often performed by speech-language pathologists. However, to intervene earlier and more frequently, training is also provided by nurses so that it can be performed in accordance with the patient's condition. If oral intake is difficult, enteral nutrition is initiated, such as by inserting nasogastric tubes. Thus, nursing care is focused on enteral feeding management while preventing diarrhea and aspiration in order to maintain good nutritional status and fluid balance.

### **3.5 Reacquisition of activities of daily living**

**“Reacquisition of activities of daily living” refers to nursing care aimed at helping patients regain activities of daily living that have declined due to the onset of stroke.**

Patients with stroke have diverse sequelae. Three months after stroke, 21.7% of patients had no symptoms at all on the mRS (Modified Rankin Scale) survey, and 48.6% needed some forms of assistance [14]. Rehabilitation and self-care training for patients with acute stroke is effective and recommended to be implemented from early onset [7]. The Agency for Health Care Policy and Research (AHCPR) guidelines also recommend initiating automatic exercises such as turning, sitting posture, and self-care within 24–48 hours of attack, if medically possible [15].

Nurses are responsible for assisting patients with activities of daily living. The nurses should not do all the activities of daily living that the patient cannot perform, but rather assist them to achieve independence. The nurses should also understand the extent to which the patient is unable to perform each activity of daily living, based on an accurate assessment of self-care ability. In Japan, the Barthel Index (BI) or functional independence measure (FIM) are used to assess the activities of daily living of stroke patients. The FIM is applied by nurses in order to evaluate the patient's actual activities of daily living. In some cases, even if there are no motor dysfunctions, the patient may be unable to perform activities of daily living due to fatigue. The patient's maximum capacity for activities of daily living is demonstrated during rehabilitation by the therapist. The nurses compare the patient's maximum ability to perform activities of daily living from actual daily activities, and analyze them to establish the difference. Early initiation of assisting patients in their activities of daily living will have a positive outcome on the subsequent degree of independence.

### **3.6 Collaboration with rehabilitation therapists**

**“Collaboration with rehabilitation therapists” refers to nursing care aimed at ensuring that patients with acute stroke effectively receive training from physical therapists, occupational therapists, and speech-language pathologists, as well as nursing care for training by nurses to restore function outside of therapists’ training hours.**

The nurses’ role is to inform the therapist of any changes in the patient that affect training. The nurses inform the rehabilitation therapist of any signs of lesion expansion or recurrence, changes in blood pressure, respiratory status, body temperature, or other general conditions, and distress symptoms such as headache, dizziness, or nausea, and any delirium, anxiety, or decreased motivation. The rehabilitation therapist also collects information in advance and conducts rehabilitation with sufficient risk management.

However, the condition of patients with acute stroke can easily change, and therapy without sufficient understanding of the patient's condition can lead to worsening of the condition or have a negative impact on the patient's physical and mental health. In Japan, the amount of time that therapists spend performing rehabilitation is fixed by health insurance. It is important for patients to decide how to spend their time outside of therapist-led training in order for them to recover their functions and regain their ability to perform activities of daily living. While some training can be performed by the patient themselves, assistance by the nurses is often necessary when it is dangerous or difficult for the patient to perform the tasks independently. The nurses should also consult with the rehabilitation therapist to discuss what kind of training is being performed during rehabilitation and how much and what kind of training should be performed during non-rehabilitation time.

To ensure that the patients receive safe and effective therapy, it is important that nurses and rehabilitation therapists collaborate and communicate regarding any aspect that concerns the patient's present condition and management.

### **3.7 Reduction of mental and social distress in patients and their families**

**“Reduction of mental and social distress in patients and their families” refers to nursing care that identifies and supports the mental and social distress of patients and their families.**

Stroke is sudden in onset and completely changes a person's life. Patients with acute stroke have difficulty in immediately accepting the sudden changes caused by their condition. The environmental changes of hospitalization and the fear of pain and illness can easily trigger a state of crisis. Furthermore, patients with acute stroke often suffer impaired consciousness and cognitive dysfunction. It takes time for them to understand their own current condition. Post-stroke depression (PSD) constitutes a complication in 33% of patients [16], and many patients have complicated psychiatric symptoms such as post-stroke apathy (PSA) and delirium.

Patients with acute stroke have varying tendencies when it comes to their ability to understand their situation as well as issues with stressors, and communication skills, due to severity of stroke. If the nurses determine that a patient's mental condition requires professional intervention, they should report it to another medical professional. Moreover, PSD, PSA and psychiatric symptoms have been reported to impair activities of daily living and quality of life [17]. Nurses can alleviate the emotional distress of patients with acute stroke, thereby helping them to continue treatment and maintain their motivation to recover.

The sudden onset of stroke can also lead to a state of crisis for the patient's family. Family members of patients in the acute phase of stroke are the voice for the patient who is unable to communicate their wishes, make decisions on behalf of the patient, and support the patient in social roles that the patient is no longer able to fulfill. The nurses' role is to maintain a good mental and social state not only for the patient but this expands also to the family members.

### **3.8 Reduction of the risk of recurrence and requirement of discharge support**

**“Reduction of the risk of recurrence and requirement of discharge support” refers to nursing care to coordinate smooth discharge or transfer from the hospital and life guidance after discharge to avoid recurrent strokes.**

In Japan, an increasing number of facilities have introduced the Stroke Regional Coordination Pass, which is shared among all healthcare institutions. In these facilities, stroke patients receive treatment, nursing care, and rehabilitation, from the acute phase through the recovery phase to the maintenance phase. The Regional Stroke Coordination Pass allows information to be shared and smoothly coordinated among all medical institutions. This provides stroke patients and their families with sufficient understanding so that the medical team may provide appropriate support. Although the effectiveness of this approach has not been verified in Japan [18], reports show that providing support for early discharge from the acute phase results in reduced long-term dependency and length of hospital stay [19]. Nurses are responsible for planning the transition of stroke patients from the acute phase to a specialized rehabilitation facility or discharge to home.

In a study of stroke recurrence rates in Japan, the 10-year recurrence rates of subarachnoid hemorrhage (SAH), brain hemorrhage, and brain infarction were 70.0%, 55.6%, and 49.7%, respectively [20]. Repeated recurrent strokes are likely to cause new sequelae or to aggravate symptoms, sometimes leading directly to death.

Thus, nurses should understand the differences in risk factors for recurrence according to stroke type. In order to reduce the risk of recurrent stroke after discharge from the hospital, it is important to continue regular checkups and medication [21], blood pressure control [22], smoking cessation [23], dietary management considering hypertension, dyslipidemia, and obesity, as well as engaging in moderate exercise, and observing early detection of signs of recurrent stroke. From the onset of stroke

until after discharge, nurses have the critical role of ensuring patients and their families have the capability to manage the burden of stroke in collaboration with the medical team.

#### **4. Conclusion**

Nursing care for patients with acute stroke is presented and classified into eight categories. For each category, the author explained the key points of nursing care based on the differences in disease type (cerebral hemorrhage, subarachnoid hemorrhage, cerebral infarction, etc.), severity of stroke, site of injury, and course of stroke. Nursing care for patients with acute stroke is important not only from the physical aspect but also from the mental and social aspects. In addition, nursing care that anticipates not only the current condition but also the future life of the patient is necessary. To this end, we hope that nurses involved with patients with acute stroke will practice the eight categories of nursing care presented in this section. It is important to further accumulate nursing evidence based on practice, improve the quality of nursing care for patients with acute stroke, and provide team care with the aim of minimizing sequelae and promoting patient recovery.

#### **Conflict of interest**

The authors declare no conflict of interest.

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