



Surviving Stroke: Post-Stroke Rehabilitation

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Purpose

The purpose of this continuing nursing education course is to provide healthcare professionals with information about stroke rehabilitation. The course provides an overview of the purpose of stroke rehabilitation and the nurse's role in rehabilitating the post-stroke patient.

Objectives

After successful completion of this course, you will be able to:

1. Identify the goals of post-stroke rehabilitation
2. Discuss the importance of early initiation of post-stroke rehabilitation
3. List members of the multidisciplinary team
4. Identify five types of stroke disabilities and discuss their management principles
5. Review pain assessment and management in the post-stroke patient

Introduction

Stroke is among the leading causes of serious long-term disability in the United States and the second leading cause of death in the world. In the United States more than 795,000 people suffer a stroke each year, 610,000 of these are first strokes, and 185,000 are recurrent strokes (American Stroke Association (ASA), 2018).

The goals of rehabilitation are to help survivors become as independent as possible and to attain the best possible quality of life.

Even though rehabilitation does not reverse brain damage, rehabilitation can substantially help people achieve the best possible long-term outcome.

The Concept of Post-Stroke Rehabilitation

Rehabilitation helps stroke survivors relearn skills that are lost when part of the brain is damaged. Depending on many factors, including the extent of the initial injury, patients may progress from sitting up and being moved between the bed and a chair to standing, bearing their own weight, and walking with or without assistance.

Beginning to reacquire the ability to carry out these basic activities of daily living represents the first stage in a stroke survivor's return to independence. For some stroke survivors, rehabilitation will be an ongoing process to maintain and refine skills and could involve working with specialists for months or years after the stroke.

While many rehabilitation programs start in an acute care facility, home-based programs may be equally as effective. There is a strong consensus among rehabilitation experts that the most important element in any rehabilitation program is carefully directed, well-focused, repetitive practice.

Did You Know?

Recently, in the largest stroke rehabilitation study in the United States, researchers compared two common techniques to help stroke patients improve their walking. Both methods—training on a body-weight supported treadmill or working on strength and balance exercises at home with a physical therapist—resulted in equal improvements in

the individual's ability to walk by the end of one year. Researchers found that functional improvements could be seen as late as one year after the stroke, which goes against the conventional wisdom that most recovery is complete by six months. The trial showed that 52 percent of the participants made significant improvements in walking, everyday function and quality of life, regardless of how severe their impairment was, or whether they started the training at two or six months after the stroke (NINDS, 2011).

What Disabilities Can Result from a Stroke?

The types and degrees of disability depend upon which area of the brain is damaged. Stroke can cause five types of disabilities:

- Paralysis or problems controlling movement (motor control)
- Sensory disturbances including pain
- Problems using or understanding language
- Problems with thinking and memory
- Emotional disturbances

Problems controlling movement (motor control)

The three most common issues with motor control after a stroke are paralysis, dysphasia, and ataxia.

- Paralysis is one of the most common disabilities resulting from stroke. The paralysis or weakness occur on the side of the body opposite the side of the brain damaged by stroke, and may affect the face, an arm, a leg, or the entire side of the body.
 - Hemiplegia: one-sided paralysis
 - Hemiparesis: one-sided weakness

Stroke patients with hemiparesis or hemiplegia may have difficulty with everyday activities such as walking or grasping objects.

- Dysphasia: damage to the brain that interferes with and makes swallowing difficult
- Ataxia: damage to the cerebellum that affects coordination, walking, and posture.

Sensory disturbances

Stroke patients may lose the ability to feel touch, pain, temperature, position, and Incontinence.

- Incontinence
 - Urinary incontinence: loss of the urge to urinate or the ability to control bladder muscles
 - Bowel incontinence: loss of the urge to urinate or the ability to control sphincter muscles
- Neuropathic pain
 - Damage to the somatosensory nervous system
 - Dysesthesia: abnormal sensations
 - Allodynia: pain from normally non-painful stimuli
 - Paroxysmal: continuous or episodic pain components
- Sensory disturbances
 - Injury to the thalamus which processes sensory information from the body to the brain may be difficult to treat.
 - Muscle injury causing weak or paralyzed muscles may cause painful

sensations especially when the patient is immobile

Language disturbances

Approximately one-fourth of all stroke survivors experience language impairments caused by an injury to the brain's language-control centers. These control centers determine what type of disturbances the patient may have.

- Dominate side of the brain: causes expressive aphasia
 - Expressive aphasia: difficulty conveying thoughts through words or writing; the ability to speak the words they are thinking, and to put words together in coherent, grammatically correct sentences.
- Rear portion of the brain: causes receptive aphasia
 - Receptive aphasia: a difficulty understanding spoken or written language or incoherent speech, devoid of meaning
- Extensive damage to several areas of the brain: causes global aphasia
 - Global aphasia: the most severe form, includes loss of linguistic ability, thought conveyance, and language understanding

Thinking and memory disturbances

Individuals may lose their ability to make plans, comprehend meaning, learn new tasks, or engage in other complex mental activities due to damage to parts of the brain responsible for memory, learning, and awareness. Commonly seen deficits resulting from stroke are:

- Anosognosia: an inability to acknowledge the reality of the physical impairments resulting from stroke
- Neglect: the loss of the ability to respond to objects or sensory stimuli located on the stroke-impaired side.
- Apraxia: loss of ability to carry out a learned purposeful movement; cannot plan the steps involved in a complex task and act on them in the proper sequence

Emotional disturbances

Many people who survive a stroke feel fear, anxiety, frustration, anger, sadness, and a sense of grief for their physical and mental losses. These feelings are a natural response to the psychological trauma of stroke. Emotional disturbances and personality changes may also be caused by brain damage.

Clinical depression appears to be the emotional disorder most commonly experienced by stroke survivors.

Test Yourself

A person who cannot understand written language after a stroke is experiencing:

1. Expressive aphasia
2. **Receptive aphasia**
3. Apraxia
4. Memory loss

Rationale: Rear portion of the brain: causes receptive aphasia, a difficulty understanding spoken or written language or incoherent speech, devoid of meaning

When Does Stroke Rehabilitation Begin?

Rehabilitative therapy begins in the acute care hospital after the person's overall condition has stabilized, often within 24 to 48 hours after a stroke. The timing of rehabilitation is dependent on the unique circumstances of the patient.

Where does Stroke Rehabilitation take place?

Inpatient Units

Inpatient facilities are either freestanding or part of larger hospital complexes. Patients stay in the facility and engage in a coordinated, intensive program of rehabilitation. These programs involve at least three hours of active therapy a day, five or six days a week, for 2-3 weeks. Inpatient facilities offer a comprehensive range of medical services access to the full range of therapists specializing in post-stroke rehabilitation.

Outpatient Units

Outpatient facilities are often part of a larger hospital complex. Patients typically spend several hours, three days each week, at the facility and return home at night. Comprehensive outpatient facilities frequently offer treatment programs as intense as those of inpatient facilities, but they also can offer less demanding regimens, depending on the patient's physical capacity. Out-patient facilities offer a comprehensive range of medical services access to the full range of therapists specializing in post-stroke rehabilitation.

Skilled Nursing Facilities

Rehabilitative services available at nursing facilities are more variable than are those at inpatient and outpatient units. Skilled nursing facilities usually place a greater emphasis on rehabilitation; however, fewer hours of therapy are offered compared to outpatient and inpatient rehabilitation units.

Home-based Programs

Home rehabilitation allows for great flexibility so that patients can tailor their program of rehabilitation and schedules. These arrangements are often best suited for people who require treatment by only one type of rehabilitation therapist. Undergoing treatment at home gives people the advantage of practicing skills and developing compensatory strategies in the context of their own living environment. In the recent stroke rehabilitation trial, intensive balance and strength rehabilitation in the home was equivalent to treadmill training at a rehabilitation facility in improving walking.

How Does Stroke Rehabilitation Progress?

A multidisciplinary team approach to rehabilitation will ensure coordination of services and a holistic approach. At the core of the multi-disciplinary team is the Rehabilitation Nurse.

The rehabilitation multidisciplinary team consists of physicians, nurses, certified nurse assistants, patient care technicians, speech-language pathologists, occupational therapists, and physical therapists, social workers, case managers, and mental health professionals. This team approach is essential to assist the patient to re-acquire the ability to carry out the

basic activities of daily living; the first stage in a stroke survivor's return to independence.

Test Yourself

Which of the following entities provides the most comprehensive post-stroke rehabilitation care?

1. **In-patient**
2. Out-patient
3. Skilled nursing homes
4. Home based care

Rationale: Inpatient facilities are either freestanding or part of larger hospital complexes. Patients stay in the facility and engage in a coordinated, intensive program of rehabilitation. These programs involve at least three hours of active therapy a day, five or six days a week, for 2-3 weeks. Inpatient facilities offer a comprehensive range of medical services access to the full range of therapists specializing in post-stroke rehabilitation.

The Role of the Multidisciplinary Team

Nurses:

Nurses specializing in post-stroke rehabilitation help survivors relearn their daily routine which may include following a medication schedule, skin care, moving in and out of a bed, and activities of daily living. Among other skills, the patient may need to learn new skills such as an ability to manage urinary and fecal incontinence. These nurses also educate the survivors to reduce risk factors that may lead to a second stroke, and provide training for caregivers.

Physicians:

The primary role of the physician is managing and coordinating the rehabilitation program for the survivor, including maintaining and optimizing the survivor's general health.

Physical Therapists:

Physical Therapists assess the stroke survivor's strength, endurance, range of motion, gait abnormalities, and sensory deficits to design individualized rehabilitation programs aimed at regaining control over motor functions.

Physical therapy emphasizes practicing isolated movements, repeatedly changing from one kind of movement to another, and rehearsing complex movements that require a great deal of coordination and balance, such as walking up or down stairs or moving safely between obstacles.

Occupational Therapists:

Occupational Therapists help survivors relearn skills needed for performing self-directed activities such as personal grooming, preparing meals, and housecleaning.

They often teach people to divide a complex activity into its component parts, practice each part, and then perform the whole sequence of actions.

Additionally, they teach people how to develop compensatory strategies and change elements of their environment that limit activities of daily living

Speech-language Pathologists:

Speech-language pathologists help stroke survivors with aphasia relearn how to use language or develop alternative means of communication.

In addition, they help people improve their ability to swallow, and they work with patients to develop problem-solving and social skills needed to cope with the after-effects of a stroke.

Social Workers/Case Managers

Social Workers and Case managers work with the survivor and family members to manage insurance issues, coordinate care, arrange for equipment and healthcare help at home.

Test Your Knowledge

Mr. Jones has experienced a severe stroke on the right side of his body. His dominant side is his left side. Mr. Jones can expect that he will be treated by:

1. A speech pathologist
2. **A physical therapist**
3. A social worker
4. An occupational therapist

Rationale: Physical Therapists assess the stroke survivor's strength, endurance, range of motion, gait abnormalities, and sensory deficits to design individualized rehabilitation programs aimed at regaining control over motor functions.

What can the Stroke Survivor Expect?

On admission to a post-stroke rehabilitation unit, a thorough initial assessment that includes the completion of a full medical, family, and social history will be done.

During the assessment, the nurse should identify risk factors for stroke recurrence in order to develop a plan of care to minimize the occurrence of these risk factors. Motor function, muscle tone, mobility, sensory and cognitive impairment; and emotional needs of both the patient and the family need to be evaluated and documented. Daily reassessments of functional ability with an emphasis on activities of daily living should be performed.

Quantifying Stroke Impairment:

Quantifying stroke impairment is an essential part of the assessment. Clinicians are encouraged to use standardized, validated assessment instruments to evaluate the patient's stroke-related impairments and functional status, and the assessment results be used to assess probability of outcome, determine the appropriate level of care, and develop appropriate interventions. These tools are used on admission and serially thereafter to determine the survivor's initial condition; and early and ongoing improvement.

The National Institute of Health's Stroke Scale (NIHSS) tool is a valid and reliable tool composed of 11 items, each of which scores a specific ability between a 0 and 4. For each item, a score of 0 typically indicates normal function in that specific ability, while a higher score is indicative of some level of impairment. The individual scores from each item are

summed in order to calculate a patient's total NIHSS score. The maximum possible score is 42, with the minimum score being a 0 (National Institute of Health (NIH), 2011).

To see the entire tool, follow this link:

http://www.ninds.nih.gov/doctors/NIH_Stroke_Scale.pdf and download the free digital version.

NIHSS Score and what it means:

Score	Stroke Severity
0	No stroke symptoms/Normal
0-4	Minor Stroke
5-15	Moderate Stroke
16-20	Moderate to Severe Stroke
21-42	Severe Stroke

Adapted from (Vega, 2014)

Managing Treatment of Stroke Disabilities

Cognitive Impairment

Patients with multiple areas of cognitive impairment may benefit from a variety of cognitive retraining approaches that may involve multiple disciplines.

The Veterans Health Association & Department of Defense Clinical Practice Guidelines (2010) recommend the use of training to develop compensatory strategies for memory deficits in post- stroke patients who have mild short term memory deficits.

Patients can be given cognitive re-training if any of the following conditions are present (Veterans' Health Association & Department of Defense, 2010):

- Attention deficits
- Visual deficits
- Memory impairment
- Executive function and problem-solving difficulties

Cognitive Impairment: Pharmacologic Management

In patients with vascular dementia or vascular cognitive impairment, healthcare providers may consider using acetylcholinesterase inhibitors, such as galantamine, donepezil, and rivastigmine, in dosages and frequency used for Alzheimer's disease (The Veterans Health Association & Department of Defense, 2010).

In addition, the non-competitive N-methyl-D-aspartate (NMDA) receptor inhibitor known as memantine (Namenda) is useful in post-stroke patients with vascular dementia or vascular cognitive impairment (The Veterans Health Association & Department of Defense, 2010).

The use of conventional or atypical antipsychotics for dementia-related psychosis or behavioral disturbance should be used with caution for short term, acute changes.

The use of centrally acting adrenergic receptor agonists (clonidine) and antagonists (prazosin) as antihypertensive medications are NOT recommended for stroke patients because of their potential to impair recovery (The Veterans Health Association & Department of Defense, 2010).

Motor Impairment

It is recommended that a comprehensive motor recovery program is initiated early on in stroke rehabilitation. A motor recovery program should incorporate multiple interventions, emphasizing progressive difficulties, repetition, and functional task practice (The Veterans Health Association & Department of Defense, 2010).

Interventions for motor recovery (including improving ambulation) should include cardiovascular exercise, fitness and strengthening, and strength training.

Consider active and passive ROM prolonged stretching programs to decrease the risk of contracture development (night splints, tilt table) in the early period following stroke. Joint movement and positioning need to be carefully monitored during rehabilitation to prevent the development of maladaptive activity patterns.

Spasticity can be minimized by employing antispastic positioning, range of motion exercises, stretching, and splinting. Contractures may need to be treated using splinting, serial casting, or surgical correction (The Veterans Health Association & Department of Defense, 2010).

Pharmacological management of motor impairment may include the use of oral agents such as tizanidine and oral baclofen for spasticity, especially if the spasticity is associated with pain, poor skin hygiene or decreased function.

Tizanidine should be used specifically for chronic stroke patients (The Veterans Health Association & Department of Defense, 2010).

Botulinum toxin has been shown to be effective in treating spasticity that is painful, impairs function, reduces the ability to participate in rehabilitation, or compromises proper positioning or skin care (The Veterans Health Association & Department of Defense, 2010).

Balance & Posture: Lower Extremities

Patients demonstrating balance impairments following stroke should be provided a balance training program.

For lower extremity (gait) impairment, treadmill training is recommended together with other task-specific practice and exercise training. However, the patient should first be assessed for any cardiac risk factors that may pose a risk for treadmill training.

The use of partial body weight support for treadmill training (partial BWSTT) can be used for up to 40% of an individual's weight.

Ankle foot orthoses (AFO) can also be used for patients with foot drop, to prevent foot drop and improve knee stability during walking.

Functional electrical stimulation (FES) is another useful adjunctive treatment for patients with impaired muscle contraction, specifically for patients with impaired gait due to ankle/knee motor impairment. FES can be utilized for individuals with acute or chronic deficits after stroke.

Transcutaneous electrical nerve stimulation (TENS) is another effective adjunctive treatment for enhancing recovery of gait function after stroke.

Balance & Posture: Upper Extremities

Upper extremity functional recovery should consist of the practice of functional tasks, emphasizing progressive difficulty and repetition. Treatment should be tailored to the individual patients, considering the intervention that is most appropriate, engaging to the patient, accessible, and available. Strength training is also a useful therapy.

Additional adjunct therapies to improve upper extremity balance and posture include:

- Constraint-Induced Movement Therapy for individuals with at least 10 degrees of extension in two fingers, the thumb, and the wrist.
- Robot-Assisted Movement therapy as an adjunct to conventional therapy in patients with deficits in arm function to improve motor skill at the joints trained.
- Functional Electrical Stimulation therapy is another option for patients who have impaired upper extremity muscle contraction, specifically with patients with elbow/wrist motor impairment, or shoulder subluxation.

Test Yourself

A score of 5-15 on the NIHSS score means that the patient has had

1. No stroke
2. A minor stroke
3. **A moderate stroke**
4. A severe stroke

Rationale: NIHSS Score and what it means:

Score	Stroke Severity
0	No stroke symptoms/Normal
0-4	Minor Stroke
5-15	Moderate Stroke
16-20	Moderate to Severe Stroke
21-42	Severe Stroke

Complications:

Medical complications may arise after an acute stroke and may present potential barriers to optimal recovery and worsen long-term outcomes. Many of the complications are preventable or treatable if recognized early in the post-stroke rehabilitation period.

Identify risk of complications by screening for:

- Aspiration risk and dysphagia
- Malnutrition and dehydration
- Compromised skin integrity and risk for pressure ulcers
- Risk of venous thromboembolism (VTE)
- Bowel and bladder dysfunction
- Alteration in sensation and pain

Aspiration Risk & Dysphagia

Dysphagia (difficulty swallowing) is present in up to 65% of patients with an acute stroke (ASA, 2016).

According to the Veterans Health Association and the Department of Defense Clinical Practice Guidelines (2010), an initial swallowing screening should be performed by an appropriately trained provider within the first 24 hours of admission to determine the risk of aspiration.

- Low risk: Patients who are cooperative, able to talk, voluntarily cough, swallow saliva and pass a simple swallowing screening test (water).
- High risk: Patients who are non-cooperative; failed the simple swallowing screening test (wet, hoarse voice or coughing are noted, or volume of water consumed is below population norms); or have a history of swallowing problems, aspiration, or dysphagia.

When screening results indicate the patient is at high risk for dysphagia, the patient should be referred to a speech-language pathologist for further evaluation and management.

Dysphagia following stroke is associated with an increased risk of complications such as

- Aspiration pneumonia
- Dehydration
- Increased mortality and co-morbidity
- Poor long-term outcome
- Increased healthcare costs

Did You Know?

Swallowing disorders, also called dysphagia, can occur at different stages in the swallowing process:

- Oral Phase: Sucking, chewing, and moving food or liquid into the throat
- Pharyngeal Phase: Starting the swallowing reflex, squeezing food down the throat, and closing off the airway to prevent food or liquid from entering the airway (aspiration) or to prevent choking
- Esophageal Phase: Relaxing and tightening the openings at the top and bottom of the feeding tube in the throat (esophagus) and squeezing food through the esophagus into the stomach

(American Speech Language Hearing Association (ASHA), 2017)

Dysphagia:

Signs and Symptoms

General signs of dysphagia may include:

- Drooling and poor oral management
 - Food or liquid remaining in the oral cavity after the swallow
 - Inability to maintain lip closure, leading to food and/or liquids leaking from the oral cavity
 - Food and/or liquids leaking from the nasal cavity
 - Complaints of food "sticking"
 - Globus sensation or complaints of a "fullness" in the neck
 - Complaints of pain when swallowing
 - Wet or gurgly sounding voice during or after eating or drinking
 - Coughing during or right after eating or drinking
 - Difficulty coordinating breathing and swallowing
 - Recurring aspiration pneumonia/respiratory infection and/or fever
 - Extra effort or time needed to chew or swallow
 - Changes in eating habits—specifically, avoidance of certain foods/drinks
 - Weight loss or dehydration from not being able to eat enough
- (ASHA, 2017)

Diagnosis

A speech-language pathologist, who specializes in swallowing disorders, can evaluate individuals who are experiencing problems eating and drinking by:

- Take a careful history of medical conditions and symptoms
- Examine the strength and movement of the muscles involved in swallowing
- Observe feeding to see posture, behavior, and oral movements during eating and drinking
- Perform special tests to evaluate swallowing, such as a modified barium swallow or an endoscopic assessment, such as video fluoroscopy and video endoscopy

Management

Current American Stroke Association stroke management guidelines recommend completion of a comprehensive clinical assessment for any stroke patient suspected to have dysphagia.

Management depends on the cause, symptoms, and type of swallowing disorder and may include:

- Specific swallowing treatment (e.g., exercises to improve muscle movement)
- Positions or strategies to help the individual swallow more effectively
- Specific food and liquid textures that are easier and safer to swallow
- Consider the use of feeding tubes to prevent or reverse the effects of malnutrition in patients who are unable to safely eat and those who may be unwilling to eat
- Oral supplementation may be considered for patients who are safe with oral intake but do not receive enough to meet their nutritional requirements

Malnutrition & Dehydration:

Food and fluid intake should be monitored in all patients, and body weight should be determined regularly.

Avoiding malnutrition and dehydration requires treating the specific problems that interfere with intake, providing assistance in feeding if needed, consistently offering fluid by mouth to dysphagic patients and catering to the patient's food preferences. If intake is not maintained, feeding by a feeding gastrostomy may be necessary (Veterans Health Association & Department of Defense, 2010).

Patients at high risk for or who have problems with nutrition should receive counseling, along with their family/caregiver, from a Registered Dietitian upon discharge regarding healthy diet and food choices.

Compromised Skin Integrity:

It is recommended that a thorough assessment of skin integrity be completed upon admission and monitored at least daily thereafter. The risk for skin breakdown should be assessed using a valid and reliable standardized assessment tool.

The Braden Scale for Predicting Pressure Ulcer Risk is such a tool. Developed by Braden and Bergstrom to assess a patient's risk of developing a pressure ulcer and assesses six criteria:

1. Sensory Perception
2. Moisture
3. Activity level
4. Ability to Adjust Body Position Independently
5. Nutrition
6. Friction and Shear

For more information regarding the use of this scale please follow this link:

<http://www.bradenscale.com/images/bradenscale.pdf>

In addition to assessing the risk for pressure ulcers the nurse must understand his/her role in maintaining skin integrity in the post-stroke rehabilitation period.

The use of proper positioning, turning and transferring techniques can prevent the buildup of pressure on any one area and maintain healthy circulation and perfusion. The judicious use of barrier sprays and lubricants can also assist in protecting the integrity of the skin.

It is recommended that special mattresses, protective dressings and padding be used in the stroke rehabilitation period to avoid skin injury due to maceration, friction, or excessive pressure (Veterans Health Association & Department of Defense, 2010).

Venous Thromboembolism

Venous thromboembolism (VTE) is a common and preventable complication after a stroke. Venous thromboembolism (VTE) is the formation of a venous blood clot; usually in a large vein in the lower extremities. Deep vein thrombus and pulmonary embolism are manifestations of VTE.



All post-stroke patients should be closely assessed and monitored for DVT formation. Signs and symptoms of a VTE include: pain, swelling, redness, warmth in the affected extremity, and superficial veins may be engorged. The most serious manifestation of a VTE is that the clot could dislodge and travel to the lungs, causing a pulmonary embolism (PE). VTE is a medical emergency; all limb swellings, however trivial, should be regarded as a VTE until proven otherwise.

Management

Mobility is the key to preventing VTE. All patients should be mobilized as soon as possible. When early ambulation is not appropriate, mechanical or pharmacologic prophylaxis should be implemented (Centers for Medicare and Medicaid Services, ND).

For more detailed information on VTE, please see RN.com's course entitled: *Venous Thromboembolism: A Life-Threatening Condition.*

Bowel & Bladder Dysfunction

Problems with bladder and bowel function are common but distressing for stroke survivors. Urinary and bowel incontinence may occur temporarily in the early post-stroke recovery phase, or may be permanently affected.

A structured and comprehensive assessment of bladder function in acute stroke patients includes:

- Assessment of urinary retention using a bladder scanner or an in- and-out catheterization
- Measurement of urinary frequency, volume, and control
- Assessment for presence of dysuria (painful urination)

Consider removal of the indwelling catheter within 48 hours to avoid increased risk of urinary tract infection; however, if a catheter is needed for a longer period, it should be removed as soon as possible, and the use of a silver alloy-coated urinary catheter is recommended.

An individualized bladder training program (such as pelvic floor muscle training in women) should be developed and implemented for patients who are incontinent of urine. The use of prompted voiding in stroke patients with urinary incontinence has also been found to be effective.

For patients suffering from constipation or bowel incontinence, a bowel management program can also be implemented.

Risk of Falls

Falls are the number one complication after acute stroke not only in the acute phase, but throughout the post-stroke life span (Cho, Yu, & Rhee, 2015). Stroke survivors are at high risk for falls in all post-stroke stages, which has severe consequences, both physically and psychosocially. Individuals with stroke have an increased risk for hip fractures, and balance and gait deficiencies.

All post-stroke patients should have a complete fall risk assessment done regularly, using a valid and reliable standardized fall risk assessment tool. Fall prevention precautions should be implemented for all patients identified to be at risk for falls while they are in the hospital.

The patient, family, and caregiver should be educated on fall prevention measures, both in the hospital setting and in the home environment.

Pain

An assessment of pain should be conducted regularly, using a valid and reliable standardized pain assessment rating scale. Pain assessment tools consider the following factors:

- Location of pain
- Quality of pain

- Quantity of pain
- Duration of pain
- Intensity of pain
- Aggravating or relieving factors

The benefits of pain control, either with pharmacologic or non-pharmacologic treatment, should be considered. Careful evaluation of the possible adverse effects of medications on an individual's ability to participate in and benefit from rehabilitation need to be carefully evaluated.

Management

Musculoskeletal pain syndromes can respond to correcting the underlying condition such as reducing spasticity or preventing or correcting joint subluxation (partial dislocation of a joint), and non-steroidal anti-inflammatory drugs (NSAIDs) may also be useful in treating musculoskeletal pain.

Neuropathic pain usually responds best to agents that reduce the activity of abnormally excitable peripheral or central neurons. Opioids and other medications that can impair cognition should be used with caution.

Centrally acting analgesics can cause confusion and deterioration of cognitive performance and interfere with the rehabilitation process (Veterans Health Association & Department of Defense, 2010).

Assisting with Activities of Daily Living

The following table indicates the activities of daily living that should be evaluated and included in the rehabilitation plan of care.

Activities in ADL and IADL	
ADL	IADL
Mobility <ul style="list-style-type: none"> • Bed mobility • Wheelchair mobility • Transfers • Ambulation • Stair climbing 	Home Management <ul style="list-style-type: none"> • Shopping • Meal planning • Meal preparation • Cleaning • Laundry • Child care
Self-Care <ul style="list-style-type: none"> • Dressing • Self-feeding • Toileting • Bathing • Grooming 	Community Living Skills <ul style="list-style-type: none"> • Money/financial management • Use of public transportation • Driving • Shopping • Access to recreational activities
Communication <ul style="list-style-type: none"> • Writing • Typing/computer use • Telephoning • Using special communication devices 	Health Management <ul style="list-style-type: none"> • Handling medication • Knowing health risks • Making medication appointments
Environmental Hardware <ul style="list-style-type: none"> • Keys • Faucets • Light switches • Windows/doors 	Safety Management <ul style="list-style-type: none"> • Fire safety awareness • Ability to call 911 • Response to smoke detector • Identification of dangerous situations

Modified from: Pedretti LQ. Occupational Therapy: Practice Skills for Physical Dysfunction. 7th ed. St. Louis: Mosby; 2012.

Providing Support

Patients and caregivers should be educated throughout the rehabilitation process to address the patient's rehabilitation needs, expected outcomes, procedures, and treatment, as well as appropriate follow-up in the home/community.

Patient and caregiver education should be provided in both interactive and written formats, and caregivers should be trained to provide a variety of treatment options based on patients' specific needs, cognitive capability, and local resources.

Comprehensive discharge planning should be done prior to discharge to ensure that all necessary support services are available as needed.

Case Study

Mr. X is a 63-year-old male admitted to an acute care rehabilitation facility following an acute stroke. On admission to the Rehabilitation Unit, his disabilities are:

1. Receptive and expressive dysphasia
2. Right-sided weakness, with paralysis in the right upper limb

On admission, Mr. X scored a 7 on the NIHSS which indicates that he has suffered a moderate stroke.

During rehabilitation Mr. X develops severe painful spasticity in his right upper right arm from subluxation of the shoulder, which is hindering Mr. X's ability to continue with rehabilitation.

Test Yourself

What are your concerns?

1. **Permanent disability**
2. **Chronic pain**
3. **Increased subluxation of the shoulder**
4. Discharge from the rehabilitation program due to inability to participate

If you chose all but the fourth option, you are correct.

Rationale: His pain is caused from the paralysis in his right arm which causes him not to use this arm. It is possible that his arm has not been supported during transfers, mobility, or while in bed to maintain natural alignment.

Conclusion

The multidisciplinary team ensures that each stroke survivor receives the best plan of care to optimize recovery.

Utilizing valid and reliable standardized tools to quantify disability and treatment options allows the team to report objectively and enhance recovery.

Resources

American Speech-Language-Hearing Association (ASHA)

<http://www.asha.org>

Tel: 800-638-8255

American Stroke Association: A Division of American Heart Association

strokeinfo@heart.org

<http://www.strokeassociation.org>

Tel: 888-4STROKE (478-7653)

National Aphasia Association

naa@aphasia.org

<http://www.aphasia.org>

Tel: 212-267-2814 / 800-922-4NAA (4622)

Fax: 212-267-2812

National Institute of Child Health and Human Information Resource Center

<http://www.nichd.nih.gov>

Tel: 800-370-2943 / 888-320-6942 (TTY)

National Rehabilitation Information Center (NARIC)

naricinfo@heitechservices.com

<http://www.naric.com>

Tel: 301-459-5900 / 301-459-5984 / 800-346-2742 (TTY)

National Stroke Association

info@stroke.org

<http://www.stroke.org>

Tel: 303-649-9299 / 800-STROKES (787-6537)

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