Stroke 3+4+5

Voluntary Movement.

- Determining the amount and quality of voluntary movement a patient can produce is one of the first steps in assessing movement potential. The patterns of motion available are different for each stroke patient.
- Factors to consider when evaluating motor control of the involved upper extremity include the following:

❑Can the patient perform reflexive but not voluntary movement? Example: Patient demonstrates active elbow extension in the involved arm when balance is disturbed (equilibrium reaction) or flexes the hemiparetic elbow while yawning (associated reaction) but cannot perform these movements on request .

- Do proximal segments (neck, trunk, shoulder, hip) stabilize as needed to provide fi rm support for movement of the distal parts, or do they substitute for distal movement? Example: A patient can raise his hemiparetic arm only with pronounced lateral bending of the trunk and excessive elevation of the shoulder girdle.
- Can voluntary movement be performed unassisted against gravity, or is it possible only with assistance in the form of positioning, support, or facilitation? Example: A patient can bring her hand to her mouth only by flexing her elbow in a horizontal plane with gravity eliminated.

- Can voluntary movement be performed in an isolated fashion or only in a synergistic pattern? Example: A patient can reach for an object on a table only with a pattern of shoulder abduction, elbow flexion, and trunk flexion rather than with the more efficient pattern of shoulder flexion and elbow extension.
- Can reciprocal movement (the ability to perform agonist/ antagonist motion in succession in an individual joint) be performed with practical speed and precision? Examples: A patient cannot produce a smooth pattern of elbow extension-flexion-extension needed to grasp a glass, take a drink, and set it back on the table but can perform each movement separately. A patient cannot perform the rapid alternating movements necessary to brush teeth.

- One of the major movement difficulties following stroke is attaining the capacity and ability to isolate and control single muscle actions and combine them in a pattern appropriate for the task at hand. In motor patterns typical in hemiplegia, movement initiated in one joint results in automatic contraction of other muscles linked in synergy with that movement. This results in limited, stereotyped movement patterns rather than adaptive, selective motions.

- In Brunnstrom’s theory of hemiplegic limb synergies (Brunnstrom, 1970), typical stereotyped patterns are described as flexor or extensor synergy patterns according to the motion at the elbow. The flexor synergy presents with scapular retraction and/or elevation, shoulder abduction and external rotation, elbow flexion, and forearm pronation. The extensor synergy presents with scapular protraction, shoulder horizontal adduction and internal rotation, elbow extension, and forearm pronation. Wrist and hand position varies

- There is considerable variation in synergistic patterning, and other causes of abnormal stereotyped patterns include compensatory movements, unnecessary movement, muscle tension resulting from exertion or stress, and movement in response to gravity (e.g., pronation). According to Brunnstrom (1970), movement recovery after stroke is determined by an individual's ability to move independently of synergies. More contemporary clinical studies suggest that in addition to pathological limb synergies, loss of strength or centrally mediated impaired inter joint coordination can contribute to movement disturbances and impaired function.

- Valid and reliable tools for evaluating voluntary movement poststroke recommended by both the AHA/ASA clinical guideline and the AOTA practice guideline are the Fugl-Meyer Assessment of Motor Function and the Motor Assessment Scale. The Fugl-Meyer Assessment is an adaptation of Brunnstrom's original Hemiplegia Classification and Progress Record and incorporates Brunnstrom's six stages of motor recovery with an underlying predicted sequence of recovery. The Fugl-Meyer Assessment of the Upper
- Extremity (FMA-UE) is the most commonly used research assessment to describe upper extremity motor impairment and evaluate the success of new interventions, but its focus on synergy patterns no longer forms the basis for newer function-oriented treatments.

- After investigating the dimensionality and construct validity of the FMA-UE, researchers suggest that assessment of reflexes in the FMA-UE gives little information about volitional movement. They also challenge the stepwise orderly sequence of motor recovery described by Brunnstrom and Fugl-Meyer and suggest instead that “UE motor behaviour during recovery may be a dynamic interaction of neural factors with the task-specific difficulty of a movement”

Strength and Endurance.

- Muscle weakness ranging from slightly less than normal strength to total inability to activate muscles has been recognized as a limiting factor in the occupation and participation of patients with hemiplegia. The measurement of muscle strength to monitor recovery after stroke has been controversial because traditional neurological rehabilitation frameworks link muscle resistance to increased upper extremity tone and pain.
- A meta-analysis of randomized controlled trials examining the evidence for strength training of the paretic upper extremity found evidence that strengthening can improve upper limb strength and function without increasing tone or pain in individuals with stroke.

- Methods used to quantify muscle strength after stroke include assessments of motor performance (e.g., Fugl-Meyer), manual muscle testing, dynamometry to measure grip strength, and measurements of active range of motion.
- Reduced endurance, seen as a decrease in the ability to sustain movement or activity for practical amounts of time, is an important limiting factor in the motor performance of stroke patients because it affects the patient's ability to participate fully in rehabilitation and occupation.
- Decreased endurance can be the result of physical and/or mental fatigue caused by the exertion required to move weakened limbs or the result of comorbid cardiac or respiratory conditions.

Functional Performance.

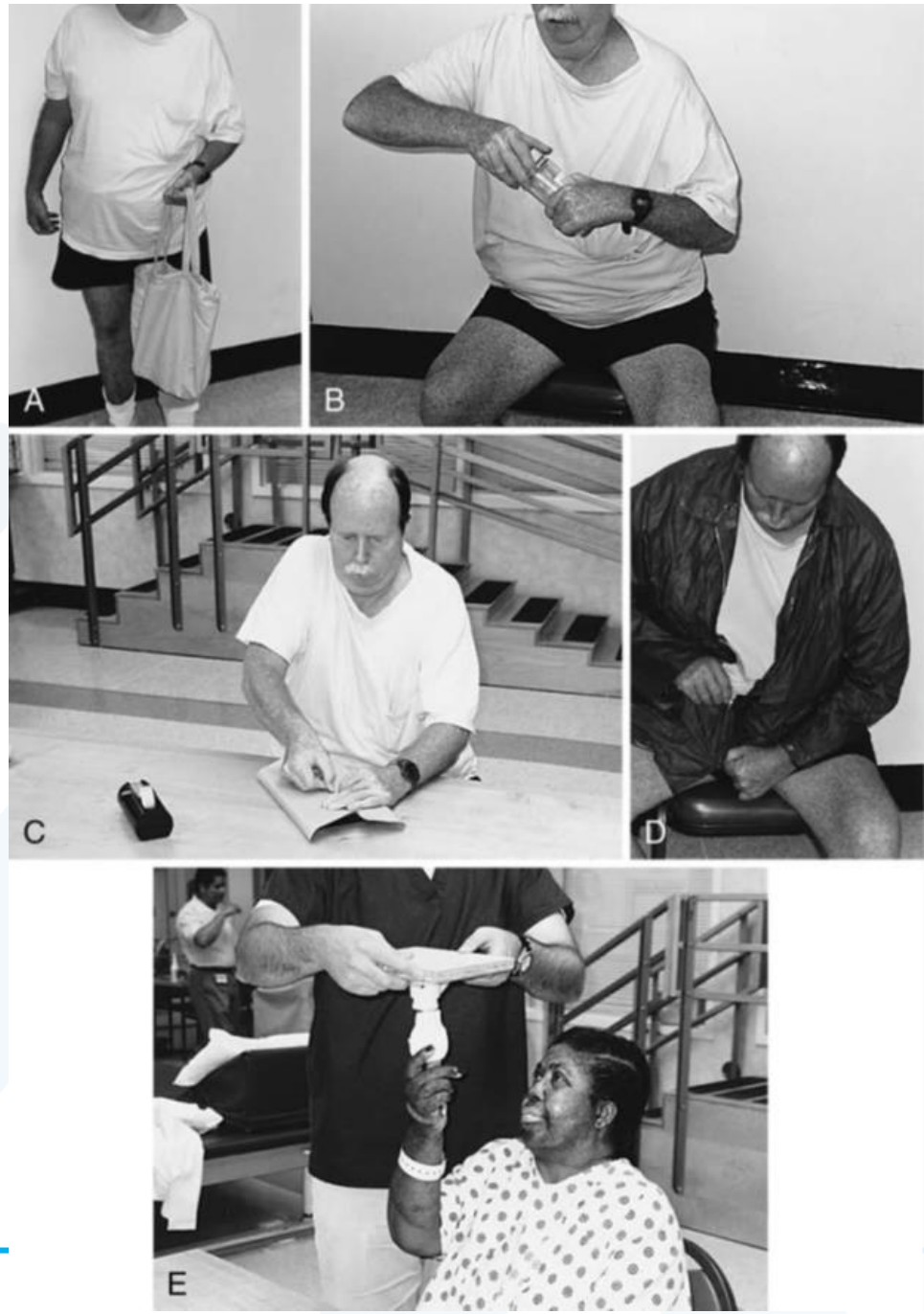
- Assessing functional use of a hemiparetic arm poststroke is problematic, because although occupational performance evaluations identify deficits in ADL and IADL, they do not accurately reflect a patient's ability to use the affected arm for tasks. As observed in a population-based study, recovery of function in more than half of patients with significant upper extremity paresis was achieved only with compensatory use of the unaffected arm

- Similarly, evaluations of client factors and motor or process skills may predict a patient's potential for functional use of a hemiparetic arm but are not measures of occupational performance.
- Reimbursement trends in fact encourage focus on a client's ability to perform daily self-care activities after stroke rather than performance skills of the hemiparetic arm.
- Further, many tests described in the literature as useful for evaluating function of the involved upper extremity can be categorized as task-oriented evaluations, with portions or simulations of familiar activities rather than relevant real-life activities.

- One difficulty in measuring function after stroke results from the normal differences in performance ability between dominant and nondominant arms. Eating with utensils, combing hair, and writing, for example, are normally performed by the dominant arm; testing the ability of a hemiparetic nondominant arm to perform these tasks is not relevant or useful to a patient. The arm has a wide range of functions, and any single test assesses only a portion of the actual possible functions. Therapists must choose tests that seem best suited for the individual patient.

- Functional tests listed in AOTA's Practice Guideline for Adults with Stroke include the Functional Test for the Hemiplegic/Paretic Upper Extremity The Functional Test for the Hemiplegic/Paretic Upper Extremity is a standardized test developed by occupational therapists specifically to evaluate patients' ability to use the hemiplegic upper extremity for purposeful tasks. This test consists of 17 tasks divided into seven functional levels that range from absence of voluntary movement to selective and coordinated movement. The tasks follow a pattern of increasing difficulty and complexity

- Functional Test for the Hemiplegic/Paretic Upper Extremity, sample tasks.
- A. Holding a pouch with a 1-pound weight.
- B. Stabilizing a jar while removing lid.
- C. Stabilizing a package while wrapping.
- D. Hooking and zipping a zipper.
- E. Putting in a light bulb.



LEVEL	TASK	DATE: 6-17-13 EXAMINER: AMW GRADE	TIME	DATE: 7-13-13 EXAMINER: AMW GRADE	TIME	DATE: 8-12-13 EXAMINER: AMW GRADE	TIME
1	Patient is unable to complete higher level tasks						
2	A. Associated reaction	(NA)		(NA)		(NA)	
	B. Hand into lap	+	2 sec	+	2 sec	+	2 sec
3	C. Arm clearance during shirt tuck	+	5 sec	+	5 sec	+	3 sec
	D. Hold a pouch	+	15 sec	+	15 sec	+	15 sec
	E. Stabilize a pillow	+	25 sec	+	14 sec	+	8 sec
4	F. Stabilize a jar	+	12 sec	+	8 sec	+	5 sec
	G. Stabilize a package	+	75 sec	+	66 sec	+	40 sec
	H. Wringing a rag	+	32 sec	+	15 sec	+	10 sec
5	I. Hold a pan lid	+	20 sec	+	20 sec	+	19 sec
	J. Hook and zip a zipper	+	55 sec	+	22 sec	+	15 sec
	K. Fold a sheet	–	>3 min	+	90 sec	+	50 sec
6	L. Blocks and box	+	35 sec	+	20 sec	+	18 sec
	M. Box on shelf	–	helped w/ L hand	+	15 sec	+	7 sec
	N. Coin in coin gauge	–	unable to pick up dime	–	dropped dime	+	15 sec
7	O. Cat's cradle			–		+	45 sec
	P. Light bulb			–		+	30 sec (difficult)
	Q. Remove rubber band					+	15 sec

Motor Learning Ability

- Motor learning refers to an individual’s acquisition of strategies for solving movement challenges in changing contexts, enabling one to adapt to his or her environment . Successful motor learning after stroke requires regaining an adequate person-environment-occupation fi t for optimal occupational function. In this context, therapists should assess factors that can affect a patient’s ability to learn or relearn, including visual function, speech and language disorders, motor planning ability, cognitive disorders, and psychosocial adjustments. Although discussed as separate categories, these factors operate as parts of an integrated system.

- It is often difficult to discern or separate, for example, cognitive functioning from visual-perceptual or speech-language skills. Does a patient fail to respond to a request to brush his teeth because he cannot locate the toothbrush in his visual field, because he has forgotten how to sequence this task, because he cannot understand the verbal request, or because he is not motivated to perform grooming tasks? These classifications are meant to assist the therapist in recognizing the components of learning impairments that follow stroke.

Visual Function

- The visual system is a complex of many parts of the central and peripheral nervous system; therefore, any type or degree of brain damage is expected to have some effect on the function of the visual system.
- VFD is the most common visual disturbance associated with stroke, and homonymous hemianopsia is the type of VFD occurring most often. Hemianopsia affects half of the visual fi eld. Homonymous means the deficit involves both eyes. A patient with left homonymous hemianopsia has decreased or absent vision in the nasal field of the right eye and the temporal field of the left eye.

- Deficits in visual attention in stroke patients are hemi-inattention and hemi-neglect or unilateral neglect . Hemi inattention describes a patient’s tendency to ignore objects on one side of the visual fi eld and can occur with or without a measurable VFD.
- Similarly, patients can have hemianopsia without hemi inattention or neglect. Neglect, a complex deficit that can affect personal (body) perception as well as near or far extra personal space is almost always associated with right parietal lobe damage and is highly predictive of poor functional recovery

- Patients with VFD only will usually learn that there are objects in the area of loss and adapt their head and eye movements in order to complete tasks. For the patient with neglect, however, objects in the area of loss simply do not exist, and adaptation is difficult if not impossible.
- Because visual defi cits are disabling to the degree that they prevent completion of necessary ADL, observation of the patient's occupational performance provides the most valuable information concerning the visual system.

- Evaluation of patients with visual deficits therefore should focus on this capability and assess the space demands of ADL as well as the patient's ability to locate and discern features of objects necessary to complete tasks effectively and safely. The study identified personal hygiene-grooming and feeding as the BADL most difficult for patients with VFD (e.g., behaviours such as not noticing food on the left side of the tray, shaving only the right side of the face). The most challenging IADL were driving, shopping, financial management, and meal preparation, all requiring one or more of the performance skills of mobility, reading, or writing

Speech and Language

- Disturbances in the ability to communicate or to comprehend oral or written information can significantly affect the ability to resume or relearn usual activities.
- The speech and language disorders associated with stroke include **aphasia**, **dysarthria**, and **apraxia of speech**.

- **Aphasia**
- Aphasia is an acquired multimodality disorder that can result in impaired understanding or input (listening, reading) and/or impaired expression or output (speaking, writing, using gestures) .
- Stroke is the leading cause of aphasia, with damage to the left cerebral hemisphere the usual origin.
- Systems for classifying and diagnosing the various types of aphasia have evolved and remain controversial, but a **simplified clinical classification** of aphasia recognizes **fluent and nonfluent** aphasias based on the patient's ability to produce speech.
- Other considerations in classification include auditory comprehension , repetition, and word retrieval .

- In the fluent aphasias, patients can easily produce spontaneous speech, but auditory comprehension and understanding of language is limited. The most common type of fluent aphasia is **Wernicke's aphasia**, or "receptive aphasia," characterized by the smooth articulation of speech but marked by incorrect word or sound substitutions and the inability to name objects, repeat phrases, or follow commands.
- Nonfluent aphasia is speech output that is difficult to produce and is characterized by slow, awkward articulation with limited vocabulary and grammar usage in the presence of relatively well-preserved auditory comprehension. An example is Broca's aphasia, or "expressive aphasia," in which the patient can follow commands but cannot name objects, repeat phrases, or convey ideas.

- A patient with large or multiple lesions in the left hemisphere may exhibit “global aphasia,” with all language modalities severely impaired.
- Most individuals with aphasia demonstrate reading and writing difficulties .
- It is important to remember that speech and language disorders are complex, highly individualized, and rarely seen in pure forms of the types just described .

- **Dysarthria** is a speech disorder caused by paralysis, weakness, or incoordination of speech musculature resulting in problems in speech production (poor articulation, poor phonation, poor voice quality) as well as drooling or decreased facial expression.
- **Apraxia** of speech is a communication problem in which the patient has difficulty initiating and sequencing the movements necessary to produce speech .

- The occupational therapist needs to work collaboratively with the speech-language pathologist to :

✓ learn the results of a patient’s communication evaluation .

✓support the patient’s language goals .

✓request suggestions for communication strategies with patients in order to enhance their participation poststroke .

Motor Planning

- Motor planning deficits, or apraxia, are deficits of skilled, organized, purposeful movement sequences used to achieve a goal.

- Apraxia cannot be explained by motor or sensory impairments or inability to follow a command .

- These deficits are best identify ed during performance of daily living tasks.

- Clinical manifestations of motor planning difficulties include the following :

❖Failure to orient the head or body correctly to a task, such as a patient attempting a toilet transfer who tries to sit on the toilet before correctly positioning the body in front of it.

❖Failure to orient the hand properly to objects and/or poor tool use, such as a patient who has to be reminded of the correct way to hold a pen when writing with the uninvolved hand.

❖Diffi culty initiating or carrying out a sequence of movements, such as a patient with nearly normal motor performance who cannot put on a shirt without step-by-step verbal and physical cueing.

❖Movements characterized by hesitations and perseveration, such as a patient who, after brushing his teeth, is handed a razor and asked to shave. After a delay, the patient brings the razor to his mouth and tries to brush his teeth with it.

❖Movements that can be performed only in context or in the presence of a familiar object or situation, such as a patient who does not follow a command to move hand to mouth unless given something to eat or drink.

- These deficits are most pronounced during learning sessions, such as when training in wheelchair propulsion or one-handed buttoning, and in activities with multiple steps, such as making a sandwich.

Cognition

- Disorders in cognitive functioning, including problems with attention, orientation, memory, and executive functioning, are common after stroke .
- Higher level executive abilities allow individuals to form goals, plan how to achieve them, and complete the plans effectively in order to perform an array of complex ADL necessary for independent living .
- Patients impaired in these abilities may have decreased safety awareness and difficulty learning new techniques for performing tasks .

- Wolf, Baum, and Connor (2009), while analyzing a large population of individuals after stroke, found that increasing percentages of patients who have mild to moderate severity of stroke at a younger age (< 65 years old), are discharged directly home, and although they may have received rehabilitation services including OT, are unable to resume IADL requiring complex cognitive behavioral strategies.
- This suggests a need for greater focus by therapists on the subtle deficits in executive functioning that interfere with family and community participation.

- Although mental status screening tests such as the Mini-Mental State Examination (Folstein, Folstein, & McHugh, 1975) are often used during the acute phase after stroke, occupational performance-based assessments focusing on the adaptive abilities of planning, initiation, organization, sequencing, judgment, and problem solving are more predictive of real-world ability (Baum et al., 2008).
- Therapists must be careful to differentiate between cognitive deficits and communication difficulties common to stroke

Psychosocial Aspects.

- Adjustment to disability is a critical component of rehabilitation, although effective measures of adjustment have not been described.
- Most patients have natural emotional reactions to their stroke, including denial, anxiety, anger, and depression .

- **Poststroke depression** is the most frequently reported reaction, affecting 25%–40% of patients within the first year after a stroke .
- Depression in stroke is both a physiological result of biochemical changes in the brain and a reaction to the personal losses of patients who realize, with time, that they will not fully recover .
- Although poststroke depression has been found to have a negative effect on recovery and independence for patients with stroke, assessment is difficult: there is no universally accepted assessment tool for poststroke depression, and cognitive and language deficits can make assessment difficult .

- Other common psychological manifestations poststroke include **anxiety and emotionalism**.
- **Anxiety disorders** have been found to frequently coexist with depression in individuals with stroke and can create feelings of worry or fear as well as physical symptoms that can decrease participation in rehabilitation or family/community roles.

- For individuals poststroke, emotional responses to situations are expected. For many stroke survivors, however, a more extreme form of emotional reaction occurs, referred to as emotional lability.
- This is an involuntary emotional response, such as uncontrollable laughing or crying, that is disproportionate to the emotional stimulus. A patient may, for example, cry whenever seeing a family member or when asked about a valued activity.

- Emotional reactions, compounded by cognitive, perceptual, and language impairments, may lead to behavioral outcomes including denial, frustration, anger, impatience, irritability, overdependence, apathy, aggression, insensitivity to others, and rigid thinking .
- These responses can further result in impaired personal interactions, decreased social participation, and eventual , isolation.
- Evaluation of the patient's and family's adjustments to the stroke, to rehabilitation, and to the prospect of living with the aftermath of the stroke can be done through interview and observation and by sharing information with other members of the rehabilitation team.

TREATMENT

- A careful interpretation of evaluation results helps determine a patient's assets and deficits in areas of occupational functioning.
- General goals of OT intervention with stroke survivors are to :

✓prevent secondary impairments .

✓restore performance skills .

✓modify activity demands and contexts as necessary .

✓promote a healthy and satisfying lifestyle .

✓maintain available performance and health .

- Intervention is always a collaborative process between therapist and client/family or caregiver .

- Possible goals for individuals recovering from stroke include the following:

1. The patient will gain competence in valued and necessary BADL and IADL in order to perform at the highest level of independence possible in the desired postdischarge setting.
2. The patient will improve postural control in order to perform daily living tasks requiring balance and changes in body position.
3. The patient will gain increased somatosensory perception and/or will employ compensatory strategies in order to perform ADL safely.
4. The patient and/or caregiver will demonstrate appropriate management techniques for the hemiparetic upper extremity to prevent pain and other secondary mechanical or physiological movement restrictions.

5. The patient will gain the necessary strength, endurance, and control of movement of the involved upper extremity in order to use the involved upper extremity spontaneously during the performance of ADL.
6. The patient will gain visual function or will employ compensatory strategies in order to safely resume previously performed ADL.
7. The patient will improve motor planning ability in order to relearn old methods or learn new methods of performing ADL.
8. The patient and/or caregiver will demonstrate appropriate strategies for improving or compensating for cognitive deficits during the performance of ADL.

9. The patient and/or caregiver will be able to verbalize the reality and impact of emotional reactions to stroke and identify coping strategies or resources to help adjust to living with a stroke.
10. The caregiver will demonstrate appropriate methods and problem-solving strategies for assisting the patient with ADL and with home activities to improve/preserve performance skills.
11. The patient will gain competence in tasks and activities necessary to resume valued roles or to assume new meaningful roles in the community.

- Intervention will vary with the patient’s stage of recovery, intervention setting, living environment, extent of impairment, and personal goals and preferences .
- Safety of the patient, during and after treatment, is a concern during all phases .

Acute Phase

- Stroke rehabilitation begins “as soon as the diagnosis of stroke is established and life-threatening problems are under control”.
- Length of stay in acute hospital beds is typically just long enough for necessary diagnostic tests, for initiation of appropriate medical treatment, and for making decisions and arrangements for the next phase of rehabilitation.
- Priorities during this early period are to prevent recurrent stroke and complications, mobilize the patient as soon as possible, encourage performance of self-care activities, and provide emotional support to patient and family.
- Patients who have just had a stroke may need to be seen bedside because of precautions, monitoring, and varying levels of consciousness.
- During this phase, the patient must adjust to the sudden, unexpected shift from usual life roles to the role of patient.

Early Mobilization and Return to Self-Care

- The patient with acute stroke should be mobilized and encouraged to perform self-care as soon after admission as is medically feasible.
- The early introduction of BADL, such as rolling in bed, sitting on the side of the bed, transferring to a wheelchair or commode, self- feeding, grooming, and dressing, helps the patient reestablish some control over the environment and begin to improve occupational functioning and component abilities and capacities .
- Even at this early stage, the occupational therapist's assessment of a patient can help determine the most appropriate setting for rehabilitation and discharge.
- The goals of discharge planning during the acute phase are to determine the need for postacute rehabilitation, arrange the best possible living environment, and ensure continuity of care after discharge

Lowering Risk for Secondary Complications

- As part of the stroke care team, the occupational therapist should practice methods to prevent or lessen complications resulting from stroke.
- **Skin Care**
- **Maintaining Soft-Tissue Length**
- **Fall Prevention**
- **Patient and Family Education**

- **Skin Care.** It is estimated that up to 21% of patients with stroke develop pressure sores .
- Those who are comatose, malnourished, or incontinent or who have diabetes, peripheral vascular disease, abnormal sensation, severe paralysis, or muscle spasticity are at greatest risk .

- The occupational therapist helps patients maintain skin integrity by doing the following:

➢ Using proper transfer and mobility techniques to avoid undue skin friction

➢ Recommending appropriate bed and seated positioning and participating in scheduled position changes as needed

➢ Assisting with wheelchair and seating selection and adaptation

➢ Teaching patient and caregiver precautions to avoid injury to insensitive skin and involved side of body

➢ Watching for signs of skin pressure or breakdown on a patient (bruising, redness, blisters, abrasions, ulceration), especially over bony areas, and alerting nursing or medical staff as appropriate

- **Maintaining Soft-Tissue Length.** Contractures, or shortening of skin, tendons, ligaments, muscles, and/or joint capsules, may result from the immobilization following stroke.
- Risk factors include muscle paralysis, spasticity, and imbalance between agonist and antagonist muscle groups.
- Contractures restrict movement, may be painful, and may limit functional recovery .
- The appropriate management is therefore a preventive program of proper positioning and soft tissue and joint mobilization.
- Suggested bed positioning for patients with stroke, based on a literature review (Carr & Kenney, 1992), is summarized in **Procedures for Practice**

- However, bed positioning, like any treatment, must be adapted to meet the individual needs of the patient.
- Care must be taken to protect the weak upper extremity during treatment because improper handling, positioning, and transferring techniques can exert great stress on the vulnerable shoulder early after stroke .
- Specific techniques for supporting the hemiparetic shoulder are discussed later in this chapter.
- Resting hand splints are often applied to prevent soft tissue shortening, but their use has not been found to significantly prevent or reverse contracture of wrist and finger flexor muscles

- Controlled and frequent soft tissue and joint mobilization is the preferred method to prevent contractures
- When a patient cannot use the involved side to engage in meaningful activities, therapists should initiate supervised active or active-assistive movement activities.
- When active movement is not possible, therapists should see that immobile body parts go through PROM at least once daily.
- If performing PROM on the involved arm, ensure mobility of the scapula on the thoracic wall before elevation of the arm and manually assist upward rotation of the scapula if needed.
- ***Safety Message: Do not attempt overhead ranges unless the scapula glides freely in upward rotation***

- The humerus should be externally rotated during abduction to prevent impingement of the supraspinatus between the greater tubercle of the humerus and the acromion process .
- As soon as possible, patients should learn strategies for safe ROM activities they can perform independently or with assistance of caregivers.

Procedures for Practice

Recommended Bed Positioning for Patients with Hemiplegia

❖ **Supine Positioning**

- Head and neck slightly flexed
- Trunk straight and aligned
- Involved upper extremity supported behind scapula and humerus with a small pillow or towel, shoulder protracted and slightly flexed and abducted with external rotation, elbow extended or slightly flexed, forearm neutral or supinated, wrist neutral with hand open
- Involved lower limb with hip forward on pillow, nothing against soles of feet .

❖ **Lying on the Unaffected Side**

- Head and neck neutral and symmetrical
- Trunk aligned
- Involved upper extremity protracted with arm forward on pillows, elbow extended or slightly flexed, forearm and wrist neutral, and hand open
- Involved lower extremity with hip and knee forward, flexed, and supported on pillows.

❖ **Lying on the Affected Side**

- Head and neck neutral and symmetrical
- Trunk aligned
- Involved upper extremity protracted forward and externally rotated with elbow extended or slightly flexed , forearm supinated, wrist neutral, and hand open
- Involved lower extremity with knee flexed
- Uninvolved lower extremity with knee flexed and supported on pillows

Fall Prevention

- For patients hospitalized with stroke, falls are the most common cause of injury .
- Factors that increase the risk of falls include advanced age, confusion, comorbidity, impulsive behavior, mobility deficits, poor balance or coordination, visual impairments or neglect, and communication deficits that interfere with a patient's ability to request assistance in a timely manner.
- Treatment that helps to prevent falls includes detecting and removing environmental hazards, scheduled routine toileting, optimizing motor control, recommending appropriate adaptive devices, and teaching safety measures to the patient and family.

Patient and Family Education

- Early in recovery, support for patients who have had strokes and their families may best be provided in the form of education to promote a realistic understanding of the causes and consequences of stroke and the process, goals, and prognosis of rehabilitation .
- All aspects of OT assessment and treatment for survivors of stroke should be considered opportunities for education: to engage cooperation and participation in the identification of meaningful treatment goals, to highlight residual abilities as well as disabilities, and to promote carryover of treatment gains.
- Because the period after stroke is stressful, emotional, and tiring for both the patient and family, education sessions provided during the acute phase should be brief, simple, and reinforced as needed with repetition or appropriate learning aids .

Rehabilitation Phase

- Part of discharge planning during the acute phase of stroke is screening for rehabilitation services. The AHA/ASA guideline recommends that “patients who have sustained an acute stroke should receive rehabilitation services if their poststroke functional status is below their prestroke status,and if there is a potential for improvement”.
- Rehabilitation choices depend on a patient’s condition, the social support system, and the resources available in a community.
- To qualify for further treatment in an inpatient rehabilitation facility, a patient must require active and ongoing intervention of multiple therapy disciplines, require an intensive rehabilitation therapy program (generally consisting of at least 3 hours of therapy per day at least 5 days per week), and reasonably be expected to actively participate in and significantly benefit from the rehabilitation program

- Patients who do not qualify for this level of rehabilitation may receive multidisciplinary rehabilitation services at a skilled nursing facility or long-term care facility or treatment by one or more disciplines in home care or in an outpatient clinic.
- During this phase of recovery, the patient and family are focused on getting better and are usually more concerned with recovering lost function than on adapting to a life of chronic disability .
- Successful OT intervention coordinates a patient’s striving for restoration of function with the potential for compensation and alternative occupational roles.