Stroke rehabilitation
Occupational therapy services

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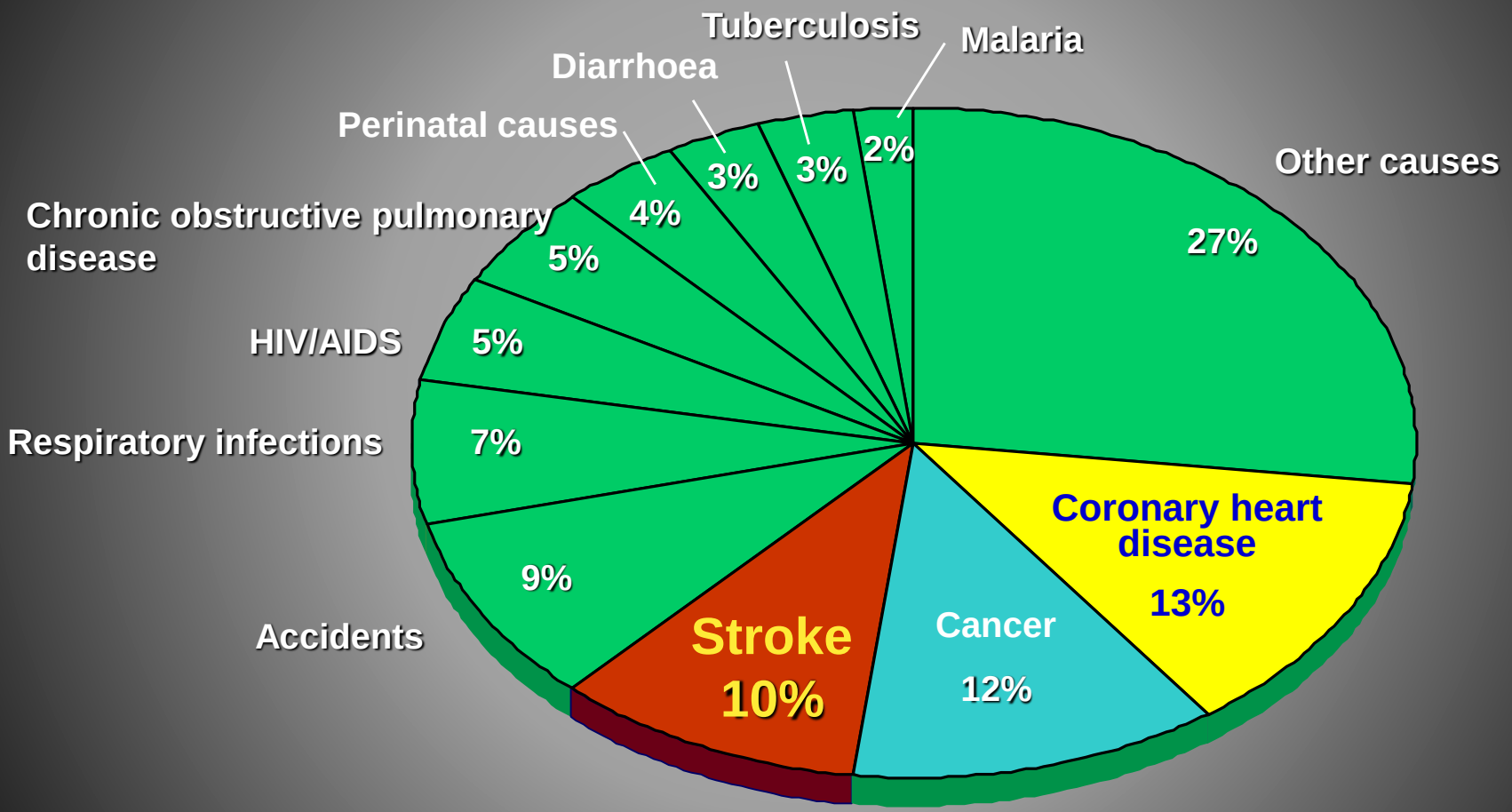
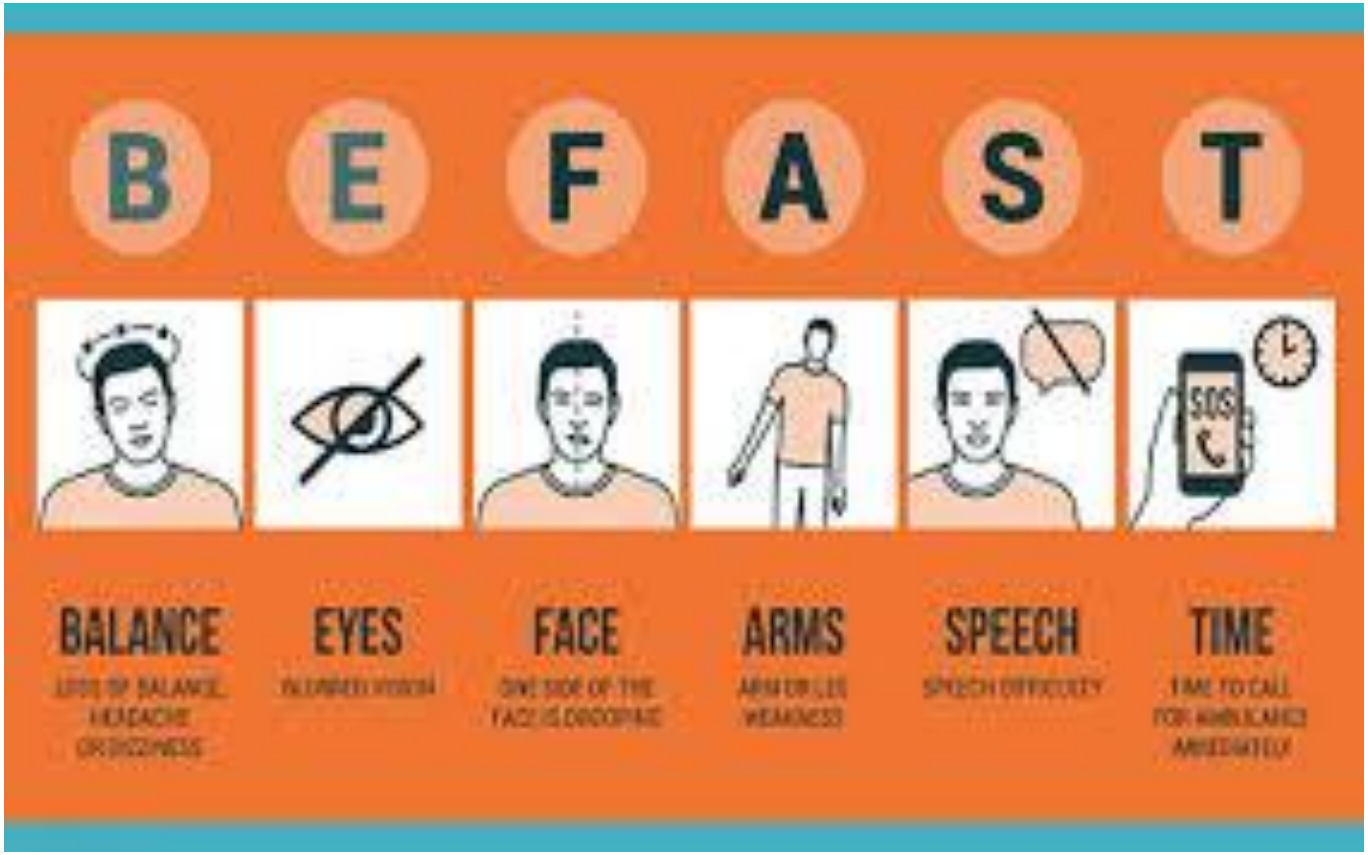
Stroke accounts for 10% of all-cause mortality



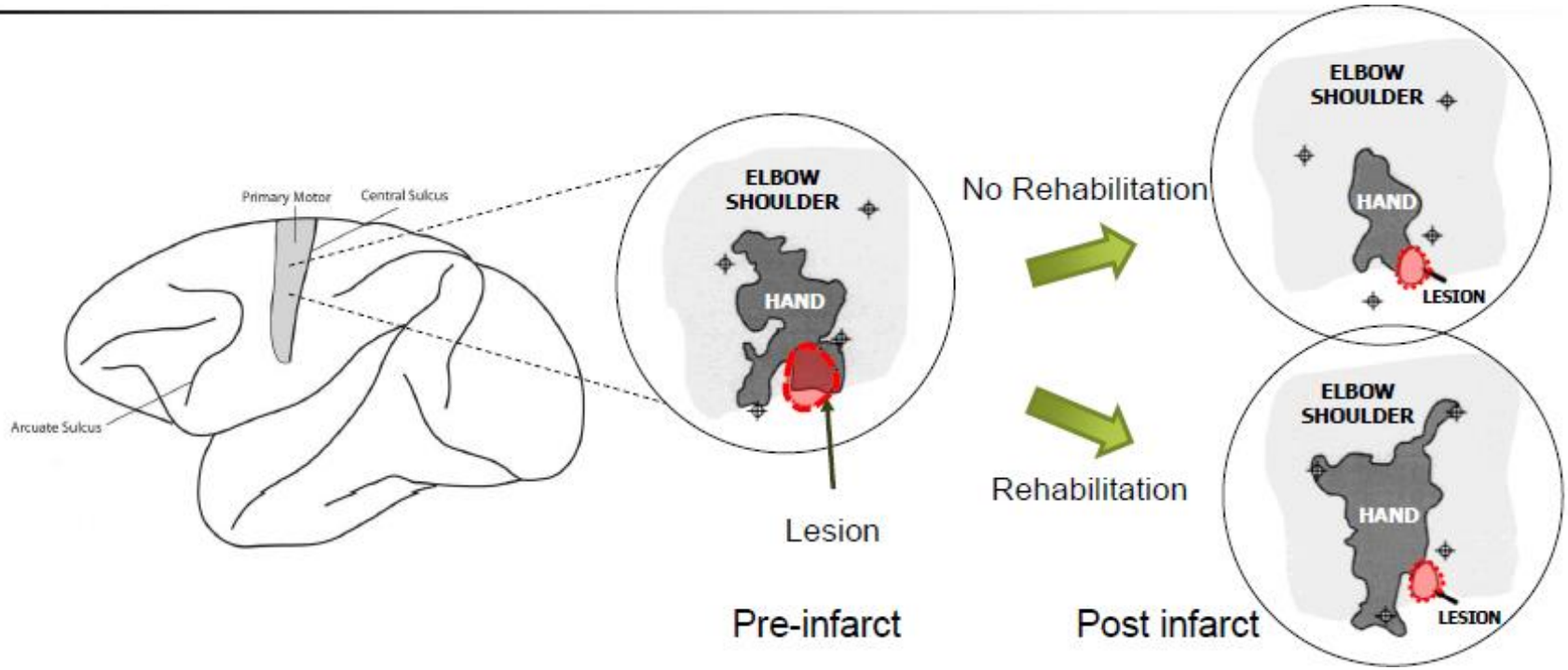
Modifiable and Nonmodifiable Risks

Type of Risk	Relative Risk (per 1000 Persons)
Modifiable Risks	
Hypertension	4.0 to 5.0
Cardiac disease	2.0 to 4.0
Atrial fibrillation	5.6 to 17.6
Diabetes mellitus	1.5 to 3.0
Cigarette smoking	1.5 to 2.9
Alcohol abuse	1.0 to 4.0
Hyperlipidemia	1.0 to 2.0
Nonmodifiable Risks	
Age	1 to 2/1000 at age 45 to 54 years old to 20/1000 at age 75 to 84 years old
Gender	1.2 to 2.1
Race (black or Hispanic)	2.0
Heredity	1.8 to 3.1


B E F A S T
BALANCE
EYES
FACE
ARMS
SPEECH
TIME
SOS

Rehabilitation

- Rehabilitation therapy should start as early as possible, once medical stability is reached
- Spontaneous recovery can be impressive, but rehabilitation-induced recovery seems to be greater on average.
- Even though the most marked improvement is achieved during the first 3 months, rehabilitation should be continued for a longer period to prevent subsequent deterioration.


Primary Motor
Central Sulcus
Arcuate Sulcus
ELBOW
SHOULDER
HAND
Lesion
Pre-infarct
No Rehabilitation
Rehabilitation
ELBOW
SHOULDER
HAND
LESION
Post infarct
ELBOW
SHOULDER
HAND
LESION

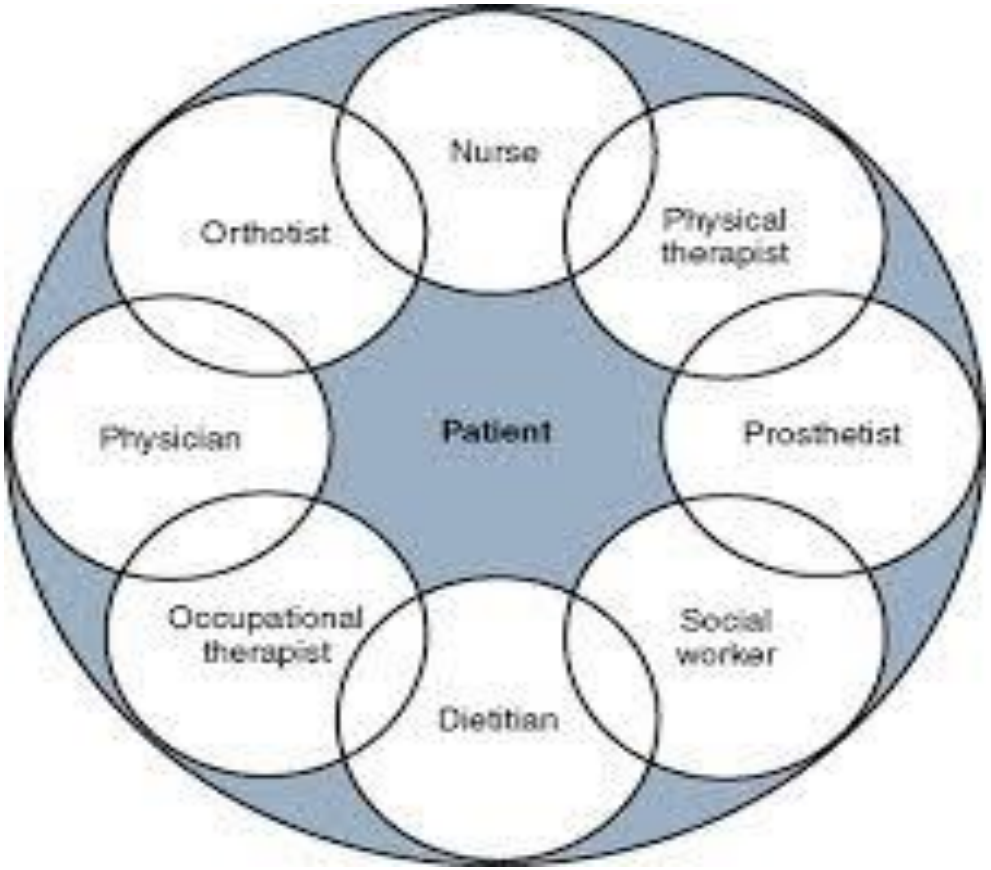
Rehabilitation

- No patient should be excluded from rehabilitation unless he is too ill or too cognitively devastated to participate in a treatment program.
- Proper positioning and early passive ROM exercises help to avoid complications at a flaccid stage.
- The family should also be referred to community groups that offer psychosocial support such as stroke clubs at the time of discharge.

Stroke Rehabilitation Phases

- Phase I: In patient
- Phase II: Early post discharge
- Phase III: Out patient
- Phase IV: Long time

MultidisciplinaryRehabilitation Team



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Successful Rehabilitation

Depend on

- how **early** rehabilitation begins
- the **extent** of the brain injury
- the survivor's **attitude**
- the rehabilitation **team's skill**
- the **cooperation** of **family** and **caregiver**

- age , cognitive status, functional status, psychological condition, …

Basic Principles of Rehabilitation

- To begin as possible early (first 48 to 72 hours)
- To assess the patient systematically (first 2-7 day)
- To prepare the therapy plan carefully
- To include the type of rehabilitation approach specific to deficits
- To evaluate patient's progress regularly

Effect of a Stroke

- Weakness
- Spasticity
- balance and/or coordination
- language
- bodily neglect or inattention
- Pain
- cognitive problems
- swallowing
- bowel or bladder control
- Fatigue
- Depression
- daily tasks

Motor impairment after stroke

49% balance

44% arm movement

52% hand movement

44% leg movement

54% walking

31% require assistance

20% need help walking

16% institutionalized

71% vocationally impaired after 7 years

34% unemployed at <65 years

Rehabilitation Goal

- To restore lost abilities as much as possible
- To prevent stroke-related complications
- To improve the patient's quality of life
- To educate the patient and family about how to prevent recurrent strokes
- Promote re-integration into family, home, work, leisure and community activities

Types of rehabilitation service

- preventive interventions against secondary complications of stroke

- dedicated rehabilitation service

preventive interventions against secondary complications of stroke

- pressure ulcer
- decreased ROM and joint contracture
- shoulder pain
- DVT
- edema
- falling

dedicated rehabilitation service

- functional mobility
- positioning
- muscle tone modulation
- balance
- upper limb function
- sensory reeducation
- visual intervention
- non language cognitive intervention
- self care and ADL

dedicated rehabilitation service (con't)

- Cardiopulmonary rehabilitation
- gait
- management of urinary incontinence
- splinting
- Transfer
- language disorder
- swallowing
- communicative disorder
- family and patient education

Pressure ulcer causes:

- Urinary tract infection
- Increased risks of intensive care unit stay,
- Prolonged length of stay
- High medical expenditure
- In-hospital mortality
- Debridement and use of antibiotics for pressure ulcer care may also impact post stroke mortality

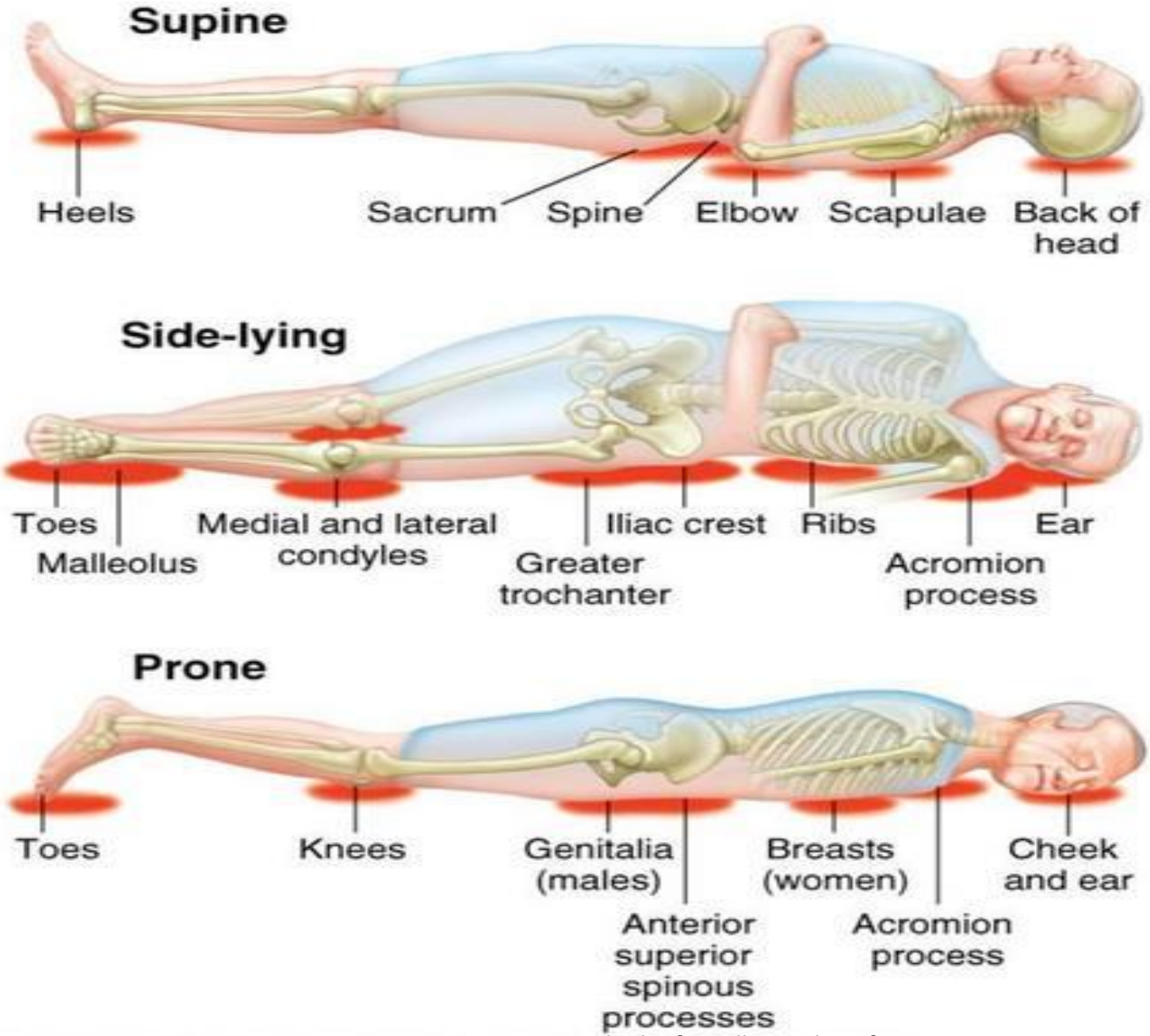

Fig. 33-2. Bony prominences subject to pressure, ischemia, necrosis, and ulceration in the supine, side-lying, and prone positions.

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pressure ulcer

- Daily monitoring and recording of the patient's skin condition in high-risk areas such as ankles, heels, and elbows
- Training in high-risk areas prone to pressure ulcers
- Advice on skin hygiene, no wrinkles and clean sheets
- Prescribe the use of special mattresses or heel and elbow protectors
- Prevent abrasion of the skin with clothing, sheets or objects, especially when moving in or out of bed ,chair and weelchair

Range of motion and contractures

- wrist and finger contracture is more prevalence
- Perform passive movements on paralyzed limbs
- Encourage active movements of the joints, especially in the half-involved body
- Daily stretching of the involved limbs and trunk
- Implementation of upper limb joint mobilization techniques in cases where there is limited movement

Shoulder pain

- Sensorimotor dysfunction of upper extremities
- 72% of stroke patient in first year
- Delay rehabilitation
- A patient prone to shoulder dislocation should have a warning sign installed to avoid pulling the injured shoulder during movement.

Causes of Shoulder Pain

- etiology of hemiplegic shoulder pain is probably multifactorial.
- Spasticity and hemiplegic shoulder pain are related. particularly of the subscapularis and pectoralis muscles
- It is uncertain whether shoulder subluxation causes hemiplegic shoulder pain
- the sustained hemiplegic posture: shoulder contractures or restricted shoulder range of motion

Causes of Shoulder Pain

- Poor handling and positioning of the affected upper limb in stroke patients contribute toward shoulder pain.

- Many types of shoulder pathology have been suggested as causes of shoulder pain including shoulder subluxation, capsulitis, tendonitis, rotator cuff injury, bursitis, impingement syndrome, spasticity, brachial plexus injury, and proximal mononeuropathies

Prevent injury and reduce shoulder pain

- Put the patient's shoulder in the maximum outward rotation, daily, for 30 minutes in the supine position
- Maintain shoulder range of motion
- Avoid excessive and violent repetition of shoulder movements up and down
- Avoid passive raising the shoulder with the arm rotated inward
- Active exercises in the range without arm pain

- Avoid using pulleys to raise the arm
- Avoid weight bearing on the upper limbs at angles greater than 80 degrees of wrist extension
- Awareness of the patient of the dangers of repetitive movements of the affected arm by a healthy hand
- Proper handling training for caregivers and families
- Electrical stimulation
- Modalities : ice, heat, massage
- Shoulder strapping

deep vein thrombosis (DVT)

- Using Intermittent pneumatic compression device
- Use elastic compression stockings to improve blood circulation
- Active movements of the lower limbs
- limbs elevation

limb edema

- Move the limbs as fast as possible
- The position of the affected limb, above the level of the heart
- Massage
- Use of pressure gloves and special socks or sometimes elastic bands

falling

- About 14 to 65% of patients fall during hospitalization
- And 73% experience falls in the first 6 months after discharge
- The most important consequence of a fall is a fracture, especially in the hip and pelvis
- Falling risk factors such as muscle weakness, gate disorder, imbalance, visual, cognitive disorders, drug side effects, osteoporosis, etc.

Prevention of falling

- Identify the risk factors for falling in the patient
- Informing the patient of complications such as fractures and subsequent immobility
- Strengthen the muscles of the lower limbs
- Teaching balance exercises
- Use walking aids
- Informing the patient about the impact of low ambient light, construction barriers, floor material, etc. on falling

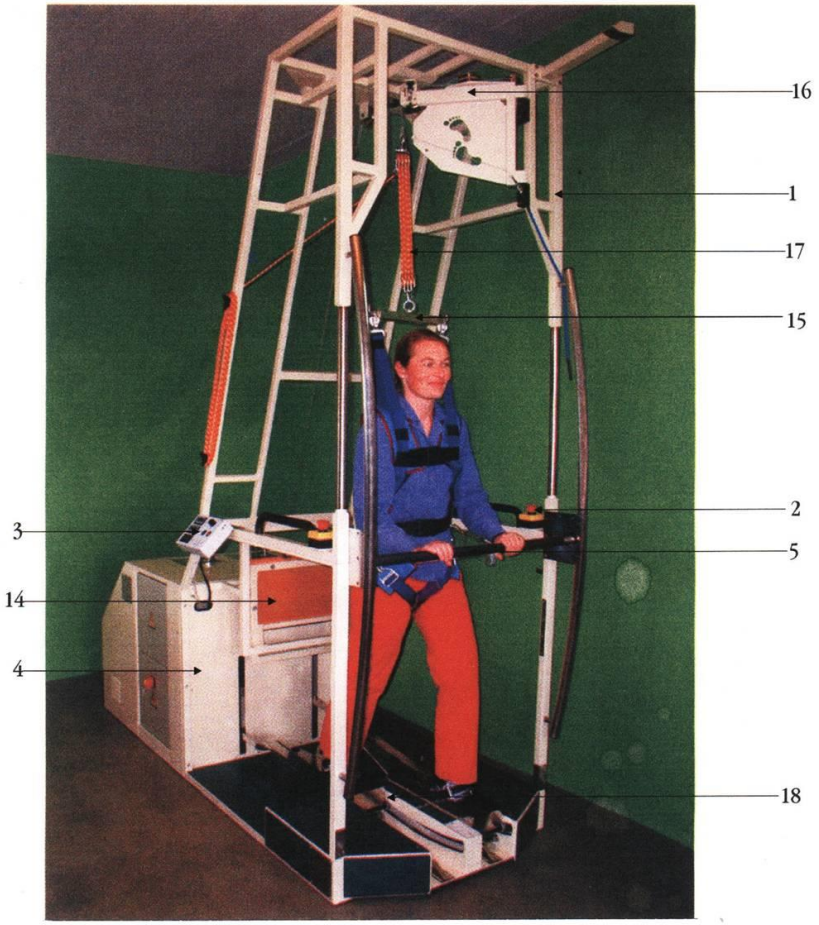
Early Mobility

- If patient's condition is stable, however, active mobility should begin as soon as possible, within 24 to 48 hours of admission
- Early mobility is beneficial to patient outcome by reducing the complication
- It has strong positive psychological benefit for the patient
- Specific tasks (turning from side to side in bed, sitting in bed) and self-care activities (self-feeding, grooming and dressing) can be given for early mobility.

Maintain mobility

- Explain the need for mobility in bed to the patient
- Emphasis on observing mobility safety in bed
- Inform the patient of the dangers of not using the affected limbs in the long run
- Encourage the patient to perform active movements, especially in the semi-involved
- Bridging practice training

Treadmill training with body weight support



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Robotics

positioning

positioning goals in the acute phase

- prevention of pressure ulcers
- prevention of contracture
- increase of sensory awareness
- improvement of respiratory function
- prevention of exacerbation Spasticity is in the subacute and chronic phase

positioning

- Positioning in supine , side lying and sitting
- Layout of the environment
- Therapists teach team members how to position the patient to avoid skin damage
- Reduce the risk of contractures and ensure joint comfort and alignment

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Tone modulation

- Muscle tone is the amount of resistance shown to passive movement
- Shock, muscle tone tends to decrease, and after a few days to a few weeks, muscle tone begins to increase.
- Muscle tone is a prerequisite for muscle activity

Aim of treatment

- Pain ↓
- ROM ↑
- Cosmatic
- Hygiene
- Mobility
- Easy use orthosis ↑
- Delay surgery

Tone modulation

- Apply tone facilitation techniques
- Weight bearing on involved limbs
- Proper positioning of the limbs in a position outside the pattern of spasticity

Balance retraining

- Balance is a prerequisite for the activities of daily living
- Weigh bearing on the upper limb with sitting and standing positions
- Emphasis on symmetrical weight distribution on both pelvic / leg halves
- Perform techniques to improve static balance sitting and standing
- Implement techniques to improve the dynamic balance of sitting and standing

- Help the patient stand with the help of protective splints behind the knee
- Stretching the trunk muscles in the half involved by performing exercises in a sitting position
- Reach out to grasp the object in different directions and distances

Upper limb function

- Positioning of upper limb in bed and chair
- Techniques to maintain soft tissue length and avoid upper limb pain
- passive , active assistive and active motion
- task specific exercise
- mental practice
- mirror therapy
- virtual reality

Constraint-Induced Movement Therapy (CIMT)

- Principle of FORCED USE to avoid the Learned Nonuse of the paretic side for Stroke patients
- Mainly for training of upper extremity
- 20 degree active wrist ext. & 10 active finger ext.
- dynamic splint

Sensory re education

- Prevalence of sensory disorders after stroke

Tactile 64%–94%

Proprioception 17%–52%

Vibration 44%

2PD, streognosis, graphestesia ,kinesthesia

- Sensory impairment have negative consequences on motor function, motor learning, and rehabilitation outcomes

Sensory re education

- Teaching the safety of anesthetized organs to the patient and family
- Using compression techniques, weight bearing on the involved limbs
- Use of electrical and thermal stimulation
- Use of vibrators

Non-linguistic cognitive interventions

- Cognitive problems after stroke increase the length of hospital stay and reduce functional independence

- The purpose of cognitive interventions is to improve social participation and independence in the activities of daily living

- including: motor praxis, memory, attention, executive function, problem solving,…

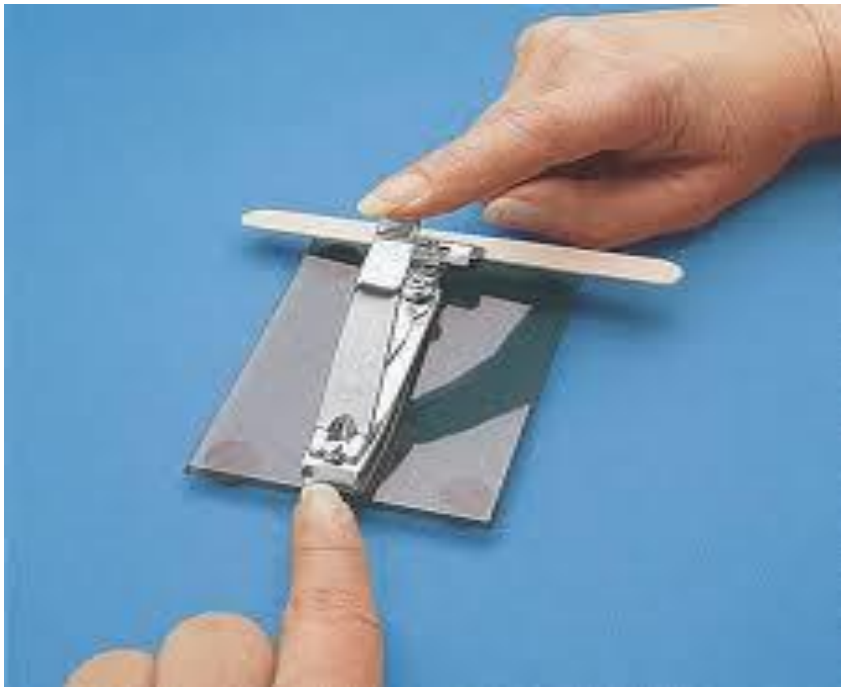
recommendations

- Cognitive assessment
- Informing families of risky situations for patients with severe pathology
- Adaptive approaches
- Cognitive rehabilitation

Activity of daily living

- Initial evaluation 72 hours after stroke according to the patient's medical condition
- bed mobility
- Adaptive and one-handed methods for performing activities of daily living
- assistive technology
- Educate family and caregiver to facilitate daily activities such brushing , washing hands and face ,…
- grading of activities

Activity of daily living



gait

- Fear of walking
- assistive aid
- assistive technology

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Orthosis and splinting

- Shoulder slings
- Hand splint
- Foot slings
- Ankle foot orthosis

Shoulder slings

Hand splints

- Flaccid = functional position
  - Wrist extend 20 – 30 degree
  - Flex MCP joint 45 degree
  - Flex PIP joint 30 - 45 degree
  - Flex DIP joint 20 degree

Hand splints

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Foot slings

Ankle Foot Orthosis

Plastic AFO

Metal AFO

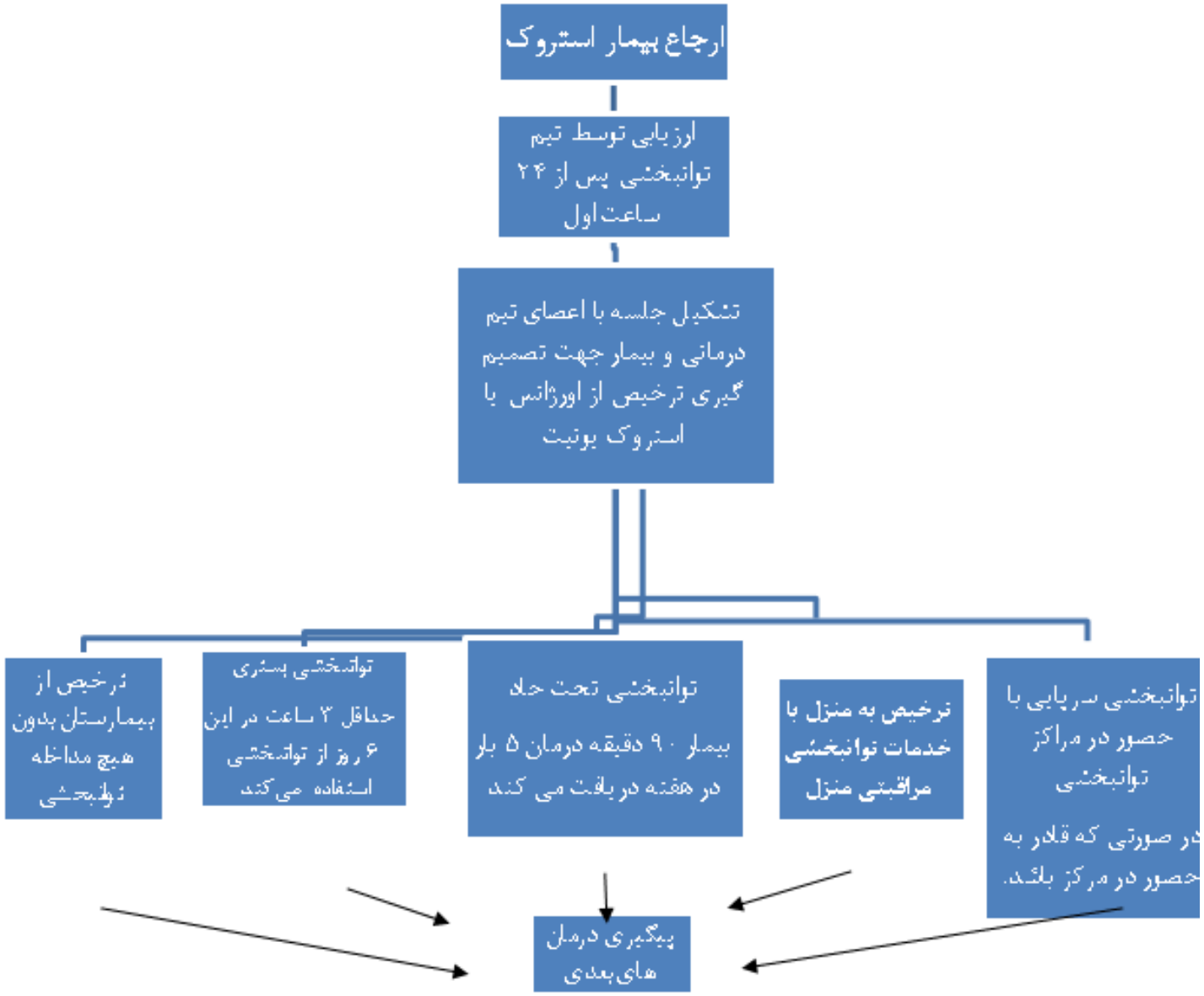

Electrode pads

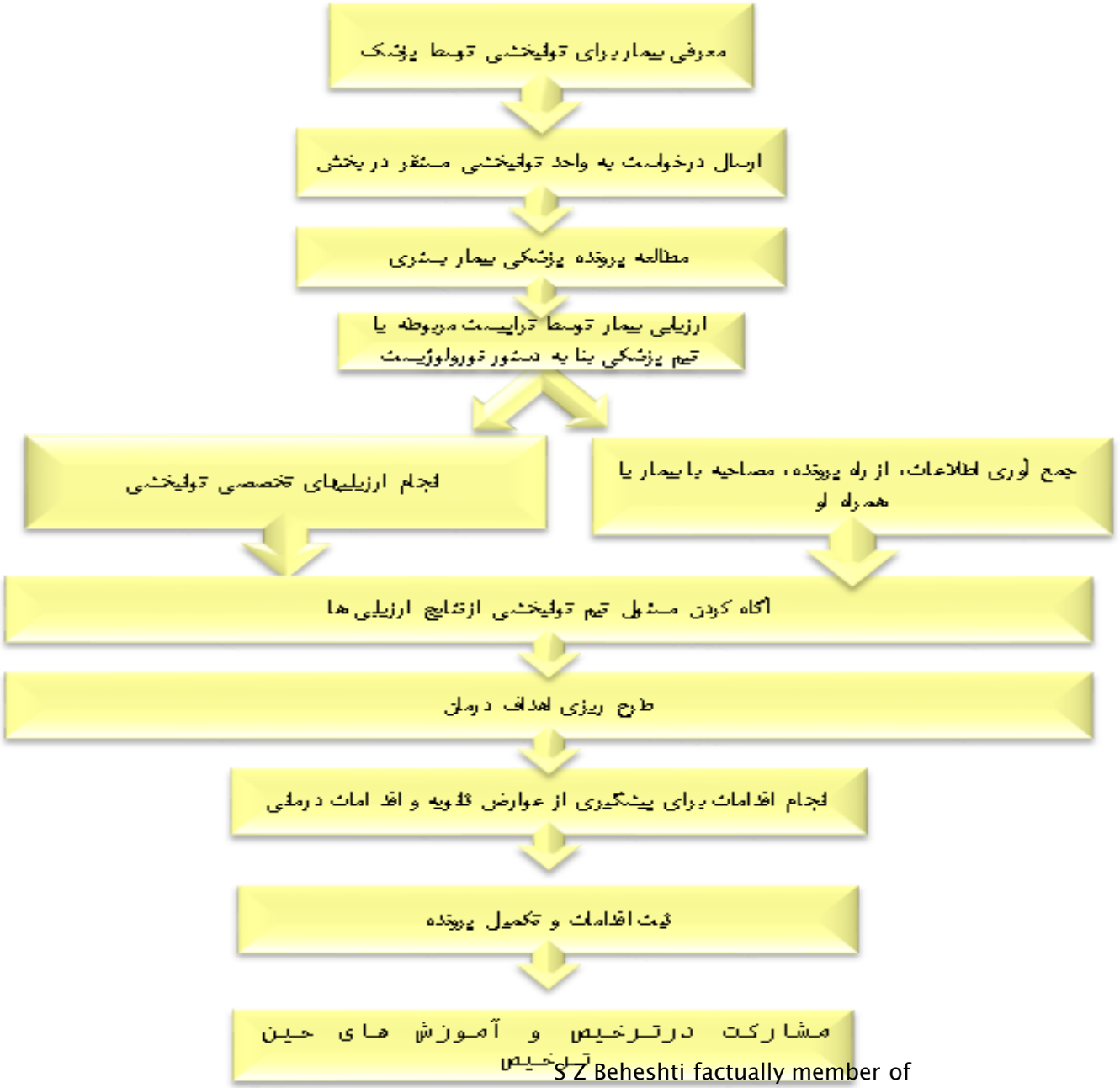
transfer

- Teach proper and safe transfer to family and Patient
- Training to get up from a lying position by rolling from both sides of the body with observance of safety
- training from bed to wheelchair by stand pivot transfer
- Weight shift training on hips
- training to stand from a sitting position
- Coordinating with a relevant neurologist or specialist for transfer training

Discharge program

- Decisions are made in coordination with changing patient needs, new goals and progress in the recovery process
- The discharge process is an organized collaboration between the treatment team, patient, family and caregivers
- Assessing the home environment is essential for a patient being transferred home
- Pre-discharge assessment of the patient
- Caregiver training according to the patient's existing needs
- Planned, purposeful and specific visits


ارجاع بیمار استروک
ارزیابی توسط تیم توانبخشی پس از ۲۴ ساعت اول
تشکیل جلسه با اعضای تیم درمانی و بیمار جهت تصمیم گیری ترخیص از اورژانس یا استروک یونیت
ترخیص از بیمارستان بدون هیچ مداخله توانبخشی
توانبخشی بستری
حداقل ۳ ساعت در این ۶ روز از توانبخشی استفاده می کند
توانبخشی تحت حاد
بیمار ۹۰ دقیقه درمان ۵ بار در هفته دریافت می کند
ترخیص به منزل با خدمات توانبخشی مراقبتی منزل
توانبخشی سرپایی با حضور در مراکز توانبخشی
در صورتی که قادر به حضور در مرکز باشد.
پیگیری درمان های بعدی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ارسال درخواست به واحد توانبخشی مستقر در بخش
مطالعه پرونده پزشکی بیمار بستری
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جمع آوری اطلاعات، از راه پرونده، مصاحبه با بیمار یا همراه او
آگاه کردن مسئول تیم توانبخشی ازنتایج ارزیابی ها
طرح ریزی اهداف درمان
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Thanks for your attention