

Rehabilitation Progression after Stroke

Hospital Discharge and Beyond

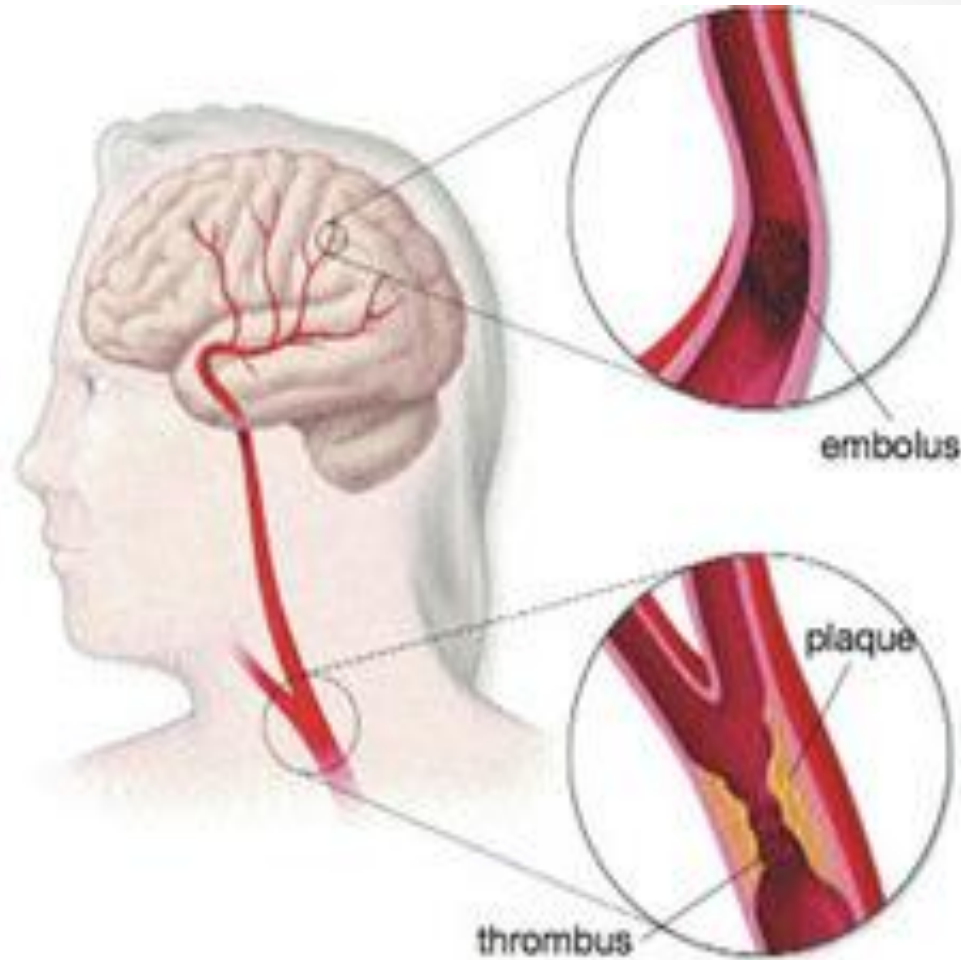
Kyle A. Smith MPT, ATC, CSRS

Owner

ORION Physical Therapy

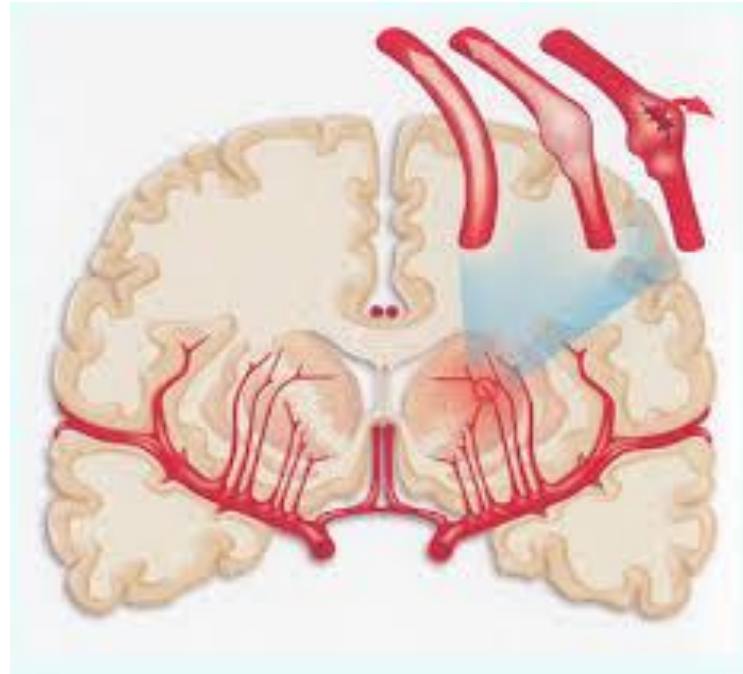
Ischemic= ξ

- Thrombotic
- %35
- Embolic
• %30



Ischemic

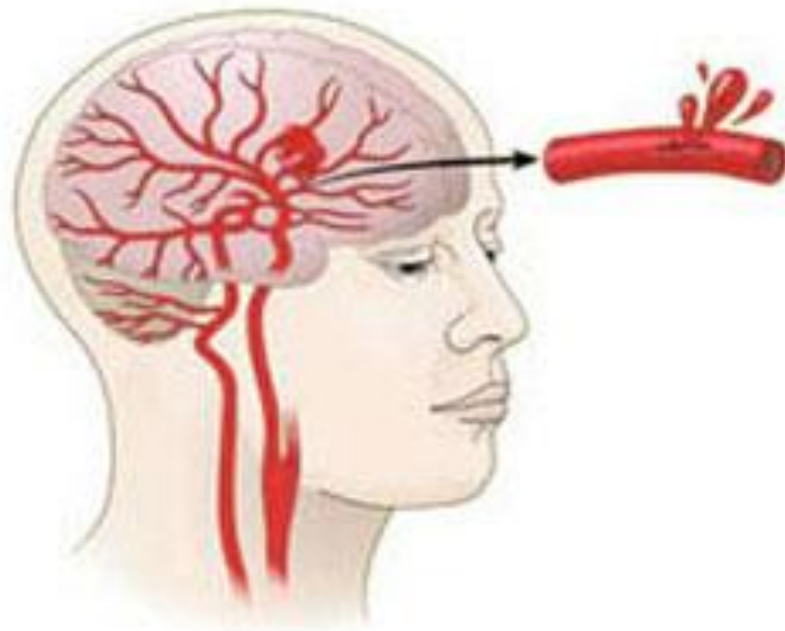
- Lacunar
 - %20



- small (0.2 to 15 mm in diameter) noncortical infarcts caused by occlusion of a single penetrating branch of a large cerebral artery that arise at acute angles from the large arteries of the circle of Willis.

Hemorrhagic= 15%

- Intracerebral (hypertensive) hemorrhage
 - 10%
- Subarachnoid Hemorrhage
 - 5%



Outcomes

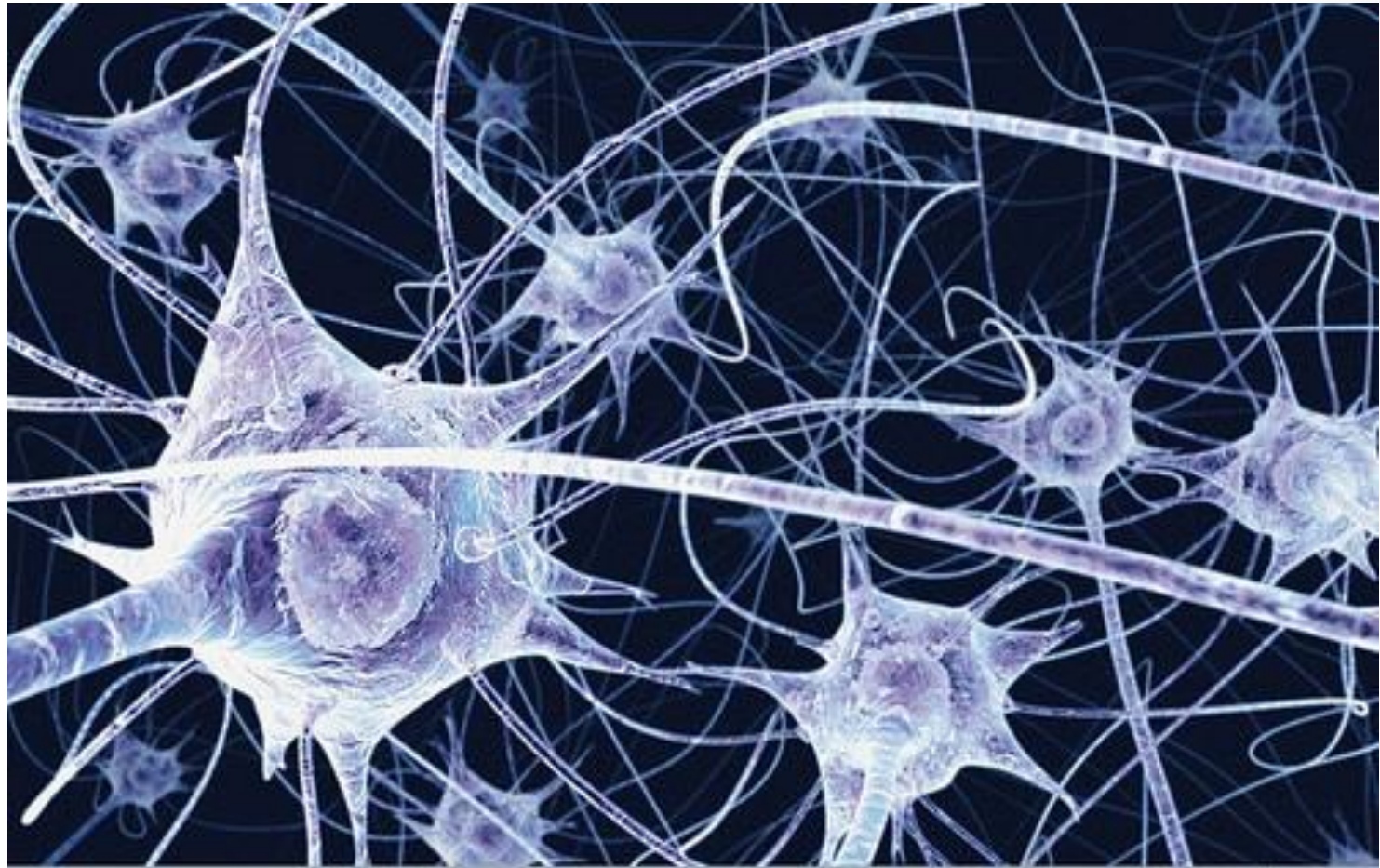
- The patients with ICH had greater functional impairment than the cerebral infarction patients at admission, but made greater gains. Patients with the most severely disabling ICH improved more than those with cerebral infarction of comparable severity. Initial severity of disability, age, and duration of therapy best predicted functional outcome after rehabilitation.

[Arch Phys Med Rehabil.](#) 2003 Jul;84(7):968-72.

Functional recovery following rehabilitation after hemorrhagic and ischemic stroke.

[Kelly PJ¹](#), [Furie KL](#), [Shafqat S](#), [Rallis N](#), [Chang Y](#), [Stein J](#).

Bottom line: Cerebral Hemorrhages tend to be associated with more edema, which take longer to subside, but which may in turn be associated with a more dramatic recovery.

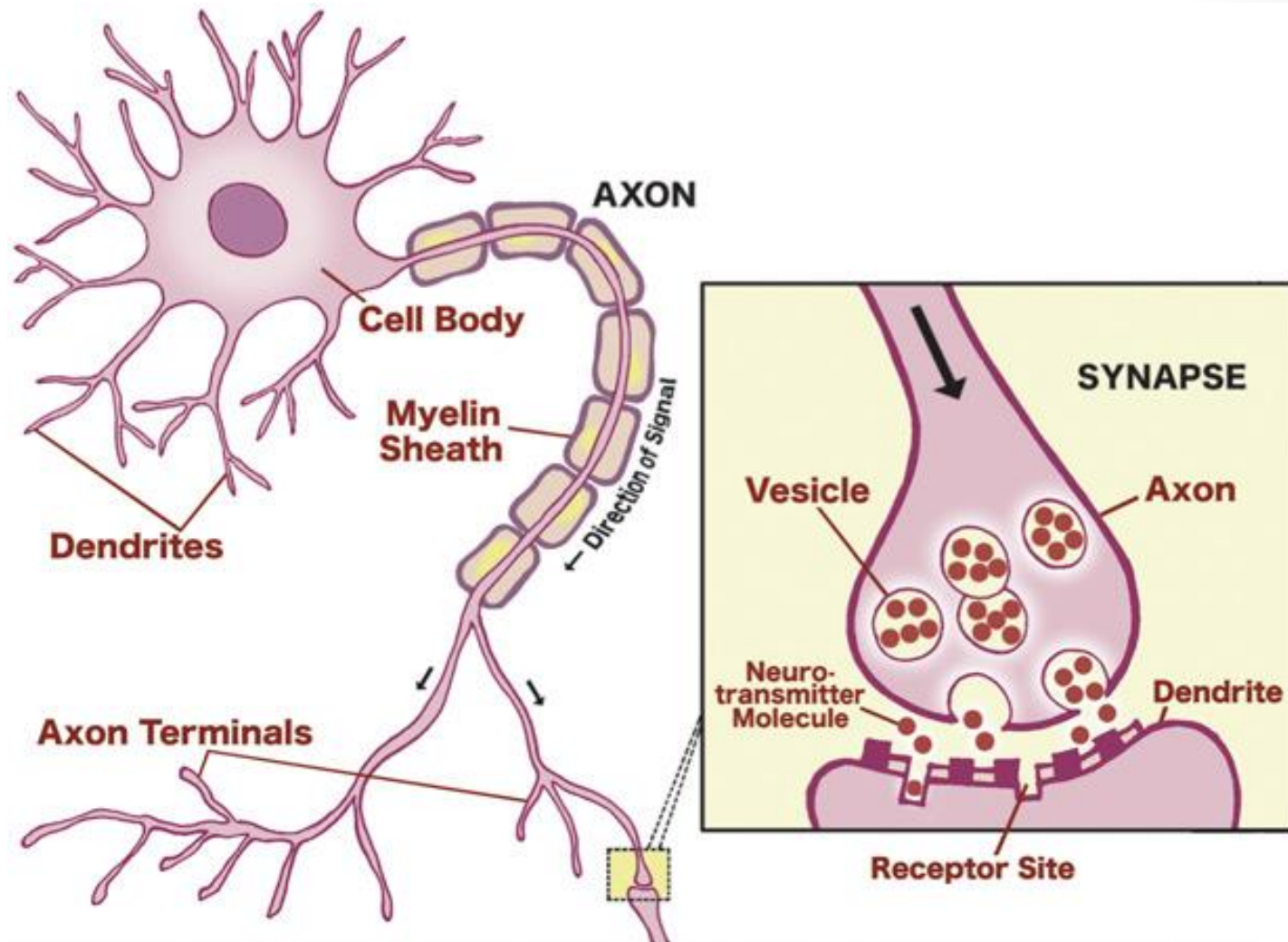


Wellcome Images

Neuroplasticity

- Promote Neural reorganization
- How do we make these connections?
 - Use it or lose it
 - Use it and improve it
 - Specificity and Repetition matter
 - Intensity, Time, Salience
 - Age matters

Kleim & Jones 2006



Is there evidence that Repetition based therapies change the brain? Liepert, et al., 2001

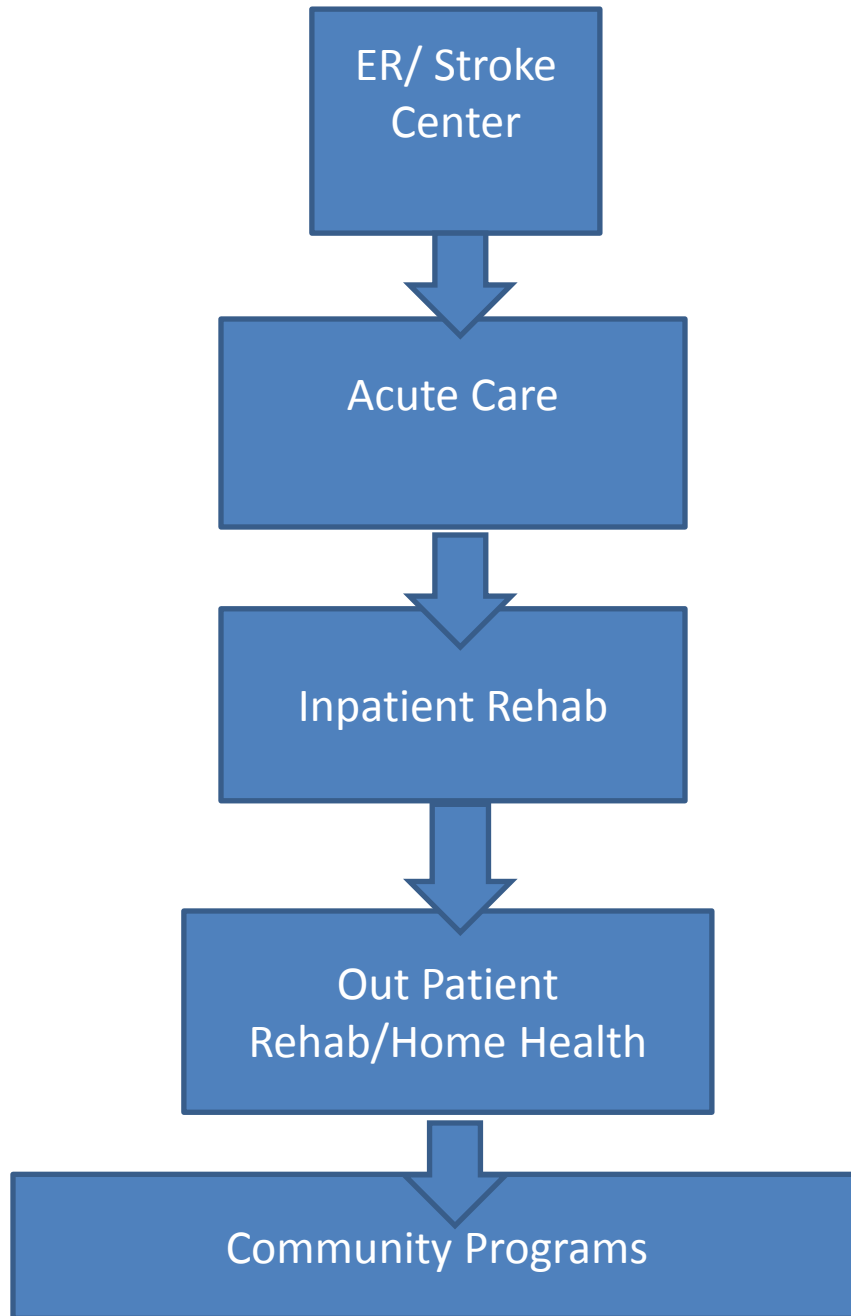
- Certain types of Estim
 - Mental Practice
 - Modified Constraint Induced Therapies
 - Certain Robotics.
-
- FMRI Studies show increased activity in the lesioned hemisphere with practice
-
- Must avoid learned non use

Interventions that promote Neural Reorganization

- Functional task training
 - Constraint induced movement therapy (Wolfe et al 2006)
 - Robot assisted therapy (Volpe et al 2008)
 - Repetitive task training (Page et al 2007)
 - Arm Ability training (Platz et al 2001)
 - Circuit training for the LE and UE

Objective Measures

- We are all take part in the justification of length of stay.
- Objective measures provide evidence of patient progress toward goals
 - FIMS
 - Reach
 - Gait-Dynamic Gait Index, Timed up and go(TUG)
 - Reach & BERG(balance measure)
 - Mini Mental, Montreal Cognitive Assessment(MOCA)



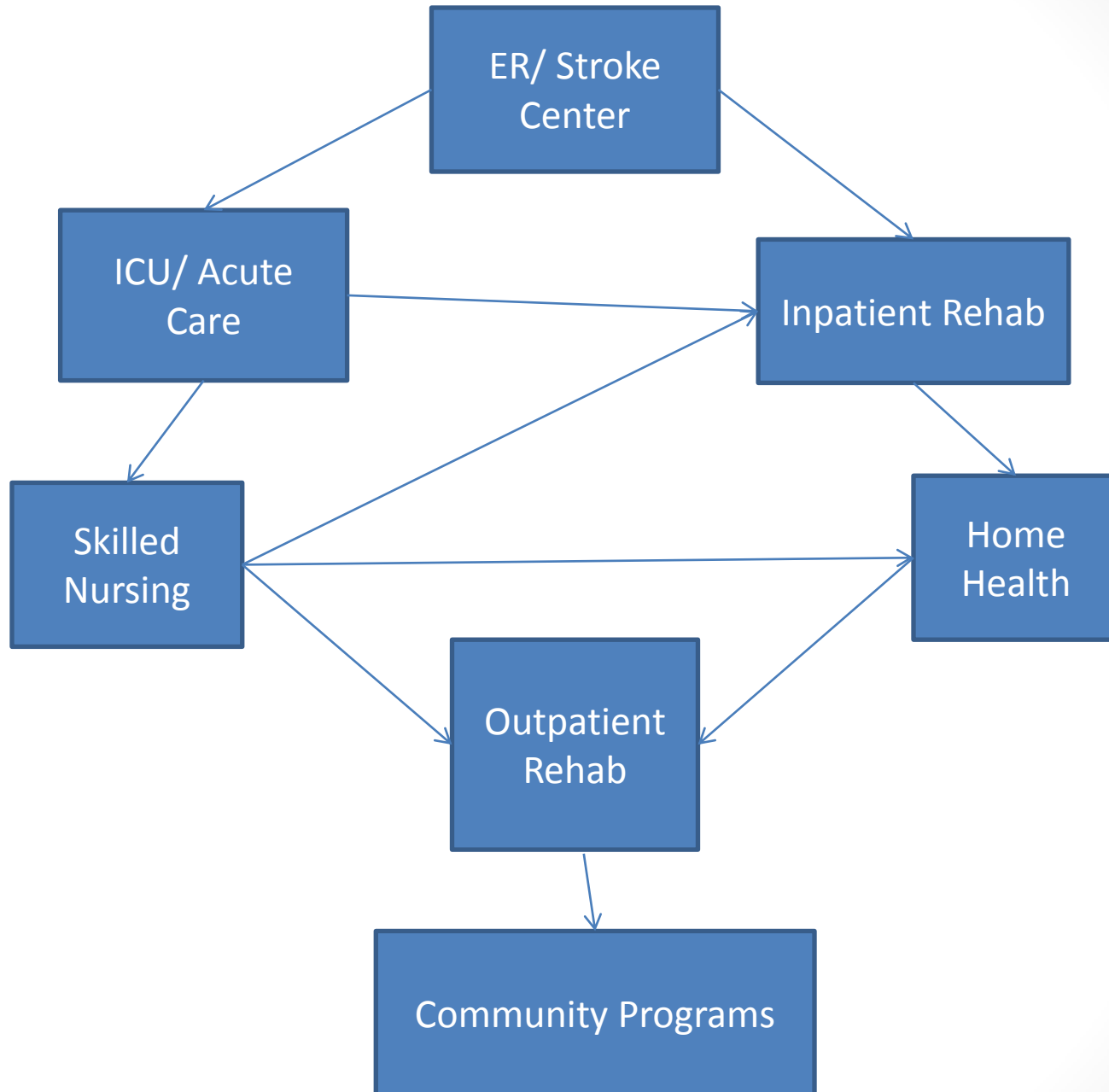
ER/ Stroke
Center

Acute Care

Inpatient Rehab

Out Patient
Rehab/Home Health

Community Programs



The Team approach

- Every patient interaction is an opportunity
- Rehab begins at day 1
 - Studies have shown a correlation between how early stroke rehabilitation is administered and improved functional outcome
 - Very intense therapy immediately post stroke may worsen outcomes as shown in animal studies
 - Much of early recovery is caused by resolution of edema around the infarct (Lo 1986)
- Consistency is vital across disciplines

Phases of Physical Therapy

- Acute care

Neuro ICU-

- Typically very limited PT
- Focus on medically stabilizing the patient

Acute

- PT begins with basic functional mobility training
- Bed mobility, transfers, balance training, gait training

Acute Physical Therapy

- Focused on Basic functional mobility

Bed mobility- Rolling, Scooting, Bridging

Transfers- supine to sit, sit to supine, bed to wheelchair, commode transfers, Sit to stand

Balance training- Static sitting at the edge of the bed in midline.

Increase sitting tolerance, in WC, Geri chair, bed.



Hooklying



Side lying to Sit



Squat Pivot

Acute Physical Therapy

Static standing : Pt may require an assistive device

Progress to midline stance

Gait training- May require an assistive device-walker, quad cane, single point cane, AFO

Progress- quality not quantity

Midline orientation

Acute PT BID until DC

Rehab Goals

- Maximize Function
- Maximize Independence
- Restore Quality of Life

Phases of Physical Therapy

- Rehab unit
 - Must be able to tolerate minimum of 3 hours per day of therapy. Combined PT, OT, SLP, Rec
 - Length of stay based on progress (theoretically)
 - Typically 1-3 weeks
 - Goal is to enable the patient to return home safely
 - If unable to reach basic goals, Skilled nursing facility(SNF) or long term care may be appropriate

In Patient Rehab

- Admit to Rehab- 3 hour rule
- Progress Functional mobility to enable Pt to return to home environment (ideal)
- Home assessment prior to DC, With Pt
- D/C when goals are met/Pt safe for household mobility

Phases of Physical Therapy

- Rehab D/C planning
 - Care conference with family discussing options including ability of family members to care for patient at home safely
 - In home caregivers may be needed to assist the family if the patients functional level is too low



Bath Bench, & 3 in 1 commode seat



Ramp

Home Health

- Goal is for patient to achieve safe functional mobility in the home, and to ambulate into and out of home.
- PT will address specific mobility obstacles in patients individual environment.
- Provide assistive device and equipment recommendations to achieve safe mobility in/out, and throughout home.
- Start to Address Community ambulation



Home Health

- Training family and caregivers to safely assist in patient transfers, gait, bathing, toileting, and home exercise program execution.

Out Patient Rehab

- Patient is able to safely get in and out of their home as well as complete car transfers.
- The patient has the strength and endurance to complete the journey to the outpatient clinic, all therapy sessions, and safely return home.
- Physical Therapy continues to progress functional mobility and endurance to maximize patient independence
 - Community ambulator

Out Patient Rehab

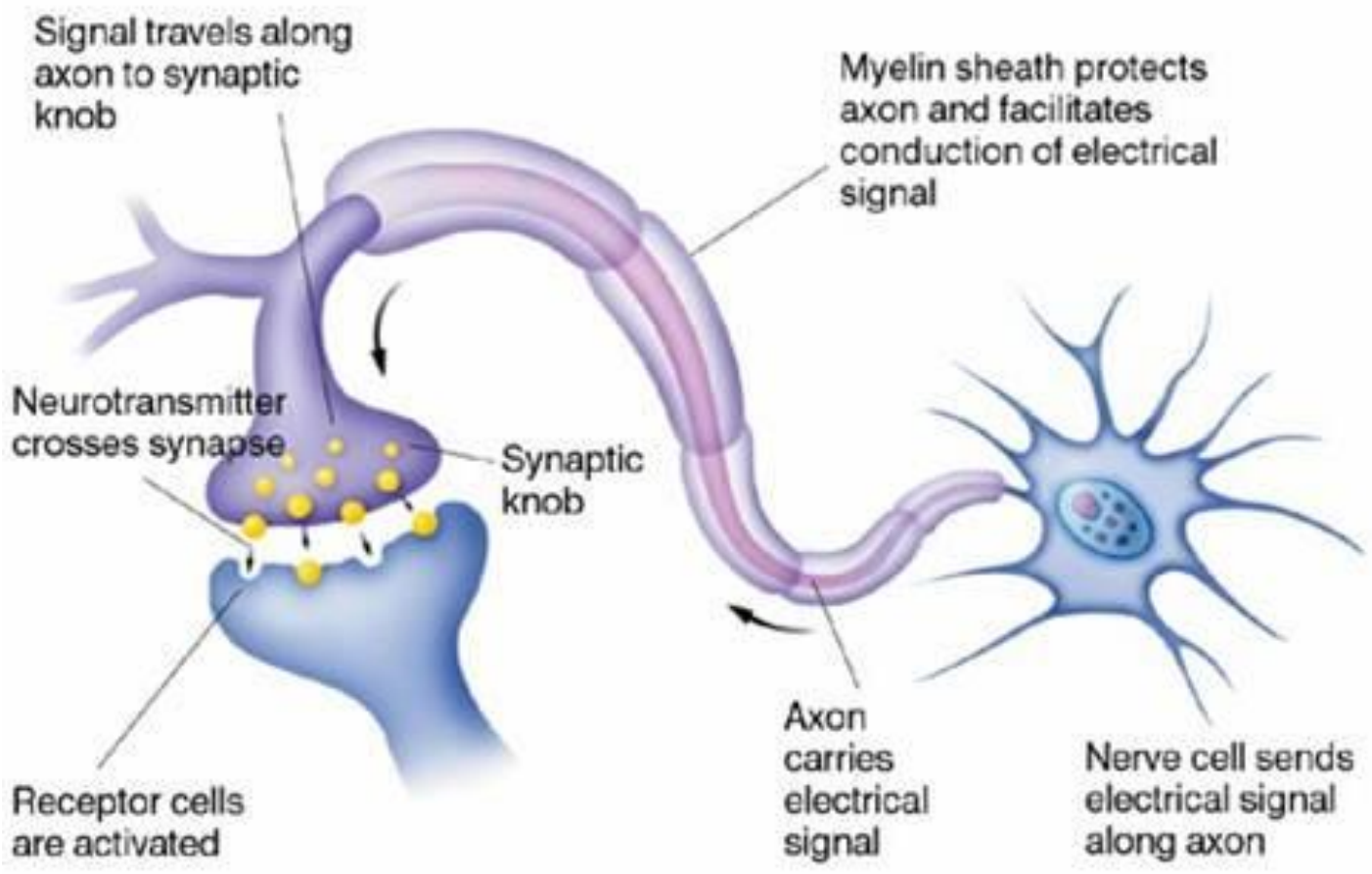
- Frequency can range from 1-3x/wk
- Duration often determined by insurance
- Outpatient visits may include multiple disciplines

Community Programs

- Patient can work on long term goals and maintenance
- Programs often in group settings
 - Group leaders PT, PTA, Adaptive PE specialist, Aids
 - Caregivers often welcome

Frequency 1-3x/wk

Often Private pay



Signal travels along axon to synaptic knob

Myelin sheath protects axon and facilitates conduction of electrical signal

Neurotransmitter crosses synapse

Synaptic knob

Receptor cells are activated

Axon carries electrical signal

Nerve cell sends electrical signal along axon



Community Programs

- Adaptive PE
 - West Valley College
 - Foothill College
 - De Anza College
 - Mission College
 - College of San Mateo
 - Evergreen College

Group Programs

REACH, Skills plus, YMCA

Recreation Programs

BORP-Bay Area Outreach and Recreation Program-adaptive cycling, Fitness Center (BORP.org)

Community Programs

Group Programs

REACH (www.foothill.edu/al/reach.php), Skills plus (www.skillsplus.us), YMCA

Recreation Programs

BORP-Bay Area Outreach and Recreation Program-adaptive cycling, Fitness Center (BORP.org)

- Disabled Sports USA Far West (www.dsusafw.org)
- Stroke awareness foundation

National Programs

- Disabled Sports USA
- National Sports Center for the Disabled
- YMCA



Long Term

- It is well documented this patient population can continue to make progress years after onset.
- Neuroplasticity principles are present at any age, any time after initial onset



Long Term

As with all of us, it is just as important for this population to practice good healthy living habits and enjoy life

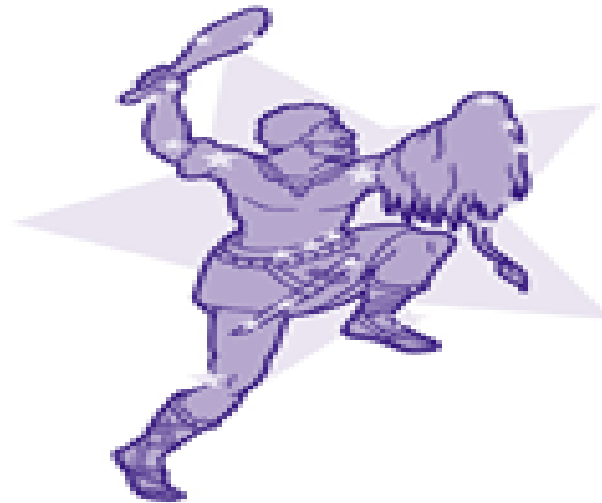




Video



Thank You!



ORION

Outpatient Rehabilitation Integrating Orthopedics & Neurology

P H Y S I C A L T H E R A P Y