Stroke: Primary Prevention and Recovery

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Objectives

- Review Ischemic and Hemorrhagic Stroke Overview
- Understand Modifiable (and Nonmodifiable) Risk Factors for Stroke
- Understand Expected Recovery Course for Different Neurological Symptoms
- Review General Counseling to Give to Stroke Survivors and Caregivers

Ischemic and Hemorrhagic Stroke

Ischemic Stroke
88%

Hemorrhagic Stroke
12%

Images: INFARCT.jpg: Lucien Monfils ; Anatomy & Physiology, Connexions Web site

Nonmodifiable Risk Factors

- Age
- Female
- Black Race (in the U.S.)
- Genetics

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Images: Micky Aldridge from Finland

Modifiable Risk Factors

Blood Pressure

Diet

Sleep

Diabetes

Tobacco

Physical Activity

Weight

Lipids

82% of Population Attributable Risk


Blood Pressure


Diet


Sleep


Diabetes


Tobacco


Physical Activity


Weight


Lipids

Blood Pressure

Single Biggest "Lifestyle" Risk Factor for stroke

- **35% of strokes worldwide** would be prevented if blood pressure were controlled

Hypertension Definition:

- Stage 1: SBP 130-139 mmHg, DBP 80-89 mmHg
- Stage 2: SBP >140 mmHg, DBP >90 mm Hg

46% of US adults have HTN

Source: O'Donnell MJ, Xavier D, Liu L, et al. Risk factors for ischaemic and intracerebral haemorrhagic stroke in 22 countries (the INTERSTROKE study): a case-control study. *Lancet*. 2010;376(9735):112-123. doi:10.1016/S0140-6736(10)60834-3

Tobacco Use

11.5% of US population smoke cigarettes

- High regional variation, up to 20% in parts of the Southeast
- Responsible for 19% of stroke deaths worldwide
- Current users at higher risk than former users

Combo of counseling and medication therapy most effective

- Bupropion (Wellbutrin)
- Varenicline (Chantix)
- Nicotine Replacement Therapy (gum, lozenge, patch)

Hajizadeh A, Howes S, Theodoulou A, et al. Antidepressants for smoking cessation. *Cochrane Database Syst Rev*. 2023;5(5):CD000031. Published 2023 May 24. doi:10.1002/14651858.CD000031.pub6

Physical Activity

AHA/US HHS/WHO Recommendation

- 150 min/week of moderate activity
  - Brisk walking
  - **30 min, 5 days per week**
- 75 min/week of vigorous activity
  - Running/Jogging
  - Swimming
  - Cycling, etc
  - 25 min, 3 days per week

Source: Bushnell C, Kernan WN, Sharrief AZ, et al. 2024 Guideline for the Primary Prevention of Stroke: A Guideline From the American Heart Association/American Stroke Association *Stroke*. 2024;55(12):e344-e424. doi:10.1161/STR.0000000000000475

Diet – Mediterranean

Recommended	Goal
Olive Oil	4 tbsp/day
Tree nuts and peanuts	3 servings/wk
Fresh Fruits	3 servings/day
Vegetables	2 servings/day
Fish, Seafood	3 servings/wk
Legumes	3 servings/wk
White Meat	Instead of Red

Discouraged	Goal
Soda	<1 drink/day
Commercial Baked Goods	<2 servings/wk
Spread Fats	<1 serving/day
Red/Processed Meat	<1 serving/day

5 year absolute risk: 5.7% ->3.6%
NNT: 53

Vitamins

Maybe

- Folic acid
- B complex vitamins (vitamin B12, B6)

Not Effective

- Vitamin C
- Vitamin E
- Selenium
- Anti-oxidants
- Calcium
- Calcium with vitamin D
- Multivitamin

Source: Bushnell C, Kernan WN, Sharrief AZ, et al. 2024 Guideline for the Primary Prevention of Stroke: A Guideline From the American Heart Association/American Stroke Association *Stroke*. 2024;55(12):e344-e424. doi:10.1161/STR.0000000000000475

Weight

- Increase in BMI of 5 = 10% increased risk of stroke
- Calorie Counting – low cost, labor intensive
  - Awareness of portion size, read labels
  - MyFitnessPal
  - Lose It!
  - Easier the more you use them
- Bariatric Surgery
- GLP-1 agonists
  - Stimulate insulin release, slow gastric emptying, promote satiety
  - Semaglutide, Tirzepatide, etc

Diabetes + Lipids

- Diabetes:
  - 1% A1c reduction = 12% decrease in stroke risk
- Lipids:
  - 10% LDL reduction = 13.5% relative risk reduction for stoke
  - Statins primarily tested
  - Other agents: Ezetimibe, PCSK9 Inhibitors

Stratton IM, Adler AI, Neil HA, et al. Association of glycaemia with macrovascular and microvascular complications of type 2 diabetes (UKPDS 35): prospective observational study. *BMJ*. 2000;321(7258):405-412. doi:10.1136/bmj.321.7258.405

Amarenco P, Labreuche J. Lipid management in the prevention of stroke: review and updated meta-analysis of statins for stroke prevention. *Lancet Neurol*. 2009;8(5):453-463. doi:10.1016/S1474-4422(09)70058-4

Obstructive Sleep Apnea

- Independently associated with mortality, stroke, HTN, AFib, heart disease
- CPAP improves daytime sleepiness and Quality of Life in moderate-severe OSA
  - CPAP more effective than dental implant device
  - Inspire stimulator is a new option

Modifiable Risk Factors

Blood Pressure

Diet

Sleep

Diabetes

Tobacco

Physical Activity

Weight

Lipids

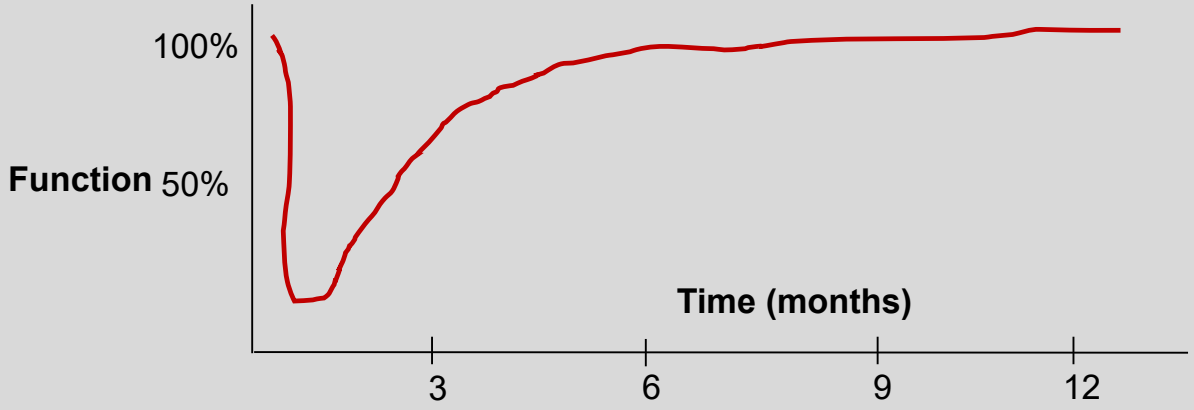
JUMP to Stroke Recovery

Physical Symptom Recovery

- Realistic hope for improvement
- Acknowledge ambiguity
- Recovery timeline depends on function impacted
  - Motor/language
  - Vision
  - Sensory
  - Fatigue/Cognitive Slowing
  - More severe cognitive impairment

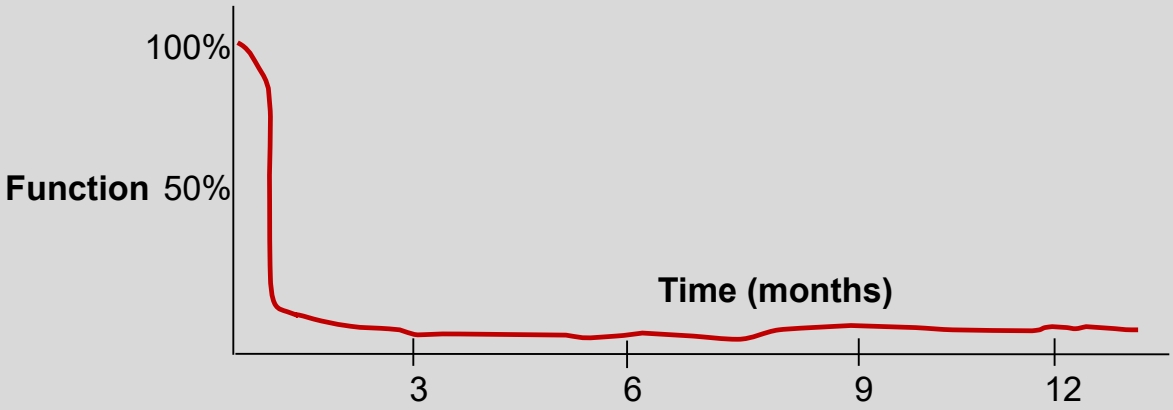
Motor/Language

- Classic timeline
  - Most rapid improvement in first 3 months
  - Keep recovering out to 1.5-2 years



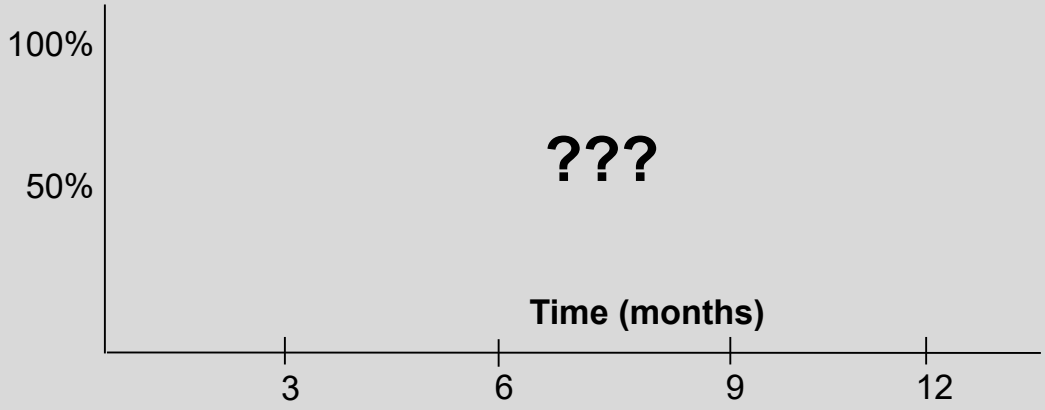
Vision – CRAO, Parieto-occipital infarct

- "Bad News and Good News"
- Poor recovery but….
- Very good adaptation



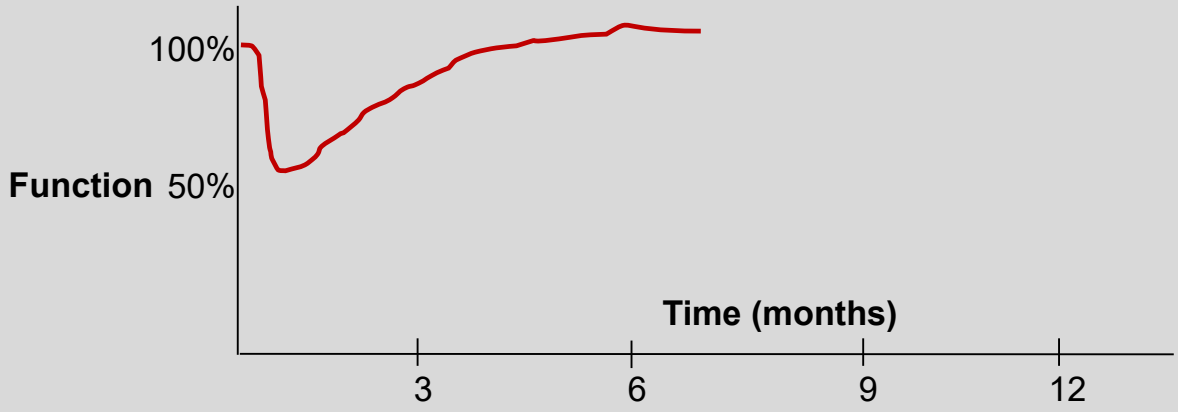
Sensation

- SUPER variable
- Most are mild, but can be debilitating



Cognitive Impairment and Fatigue

- Vey Common, can be debilitating
- Requires the patient to "give yourself grace"
- Improves over 3-6 months (strongly age dependent)



Neuropsychological Testing

- Particularly useful for:
  - Working age with few motor deficits -> objective evidence of disability
  - Baseline Cognitive Function for young patients
  - Identifying specific cognitive adaptive strategies

Specific Physical Concerns

- Dysarthria/Dysphagia – SLP. PEG removal?
- Spasticity – Baclofen is my first line. Botox is treatment of choice – PM&R referral
- Movement/adaptive equipment – wheelchair clinic
- Neuropathic pain – gabapentin, pregabalin, duloxetine. Exercise.
- Headache
  - Preventative: Usual headache treatment (BB, topiramate, CGRP)
  - Abortive: CGRP (Ubrelvy). Triptans and NSAIDS contraindicated

Emotional Recovery

- Orient to the process of recovery
- Validate/name feelings and normalize experience
- Instill realistic hope – "There is life after stroke"

- Months 0-1: "Survival Mode"
- Months 2-4: "Stabilizing"
  - Effort directed inward
- Months 5+: "Re-engaging"
  - Effort directed outward
  - Sometimes people need a push
  - Service is important to provide meaning to your days

Depression and Anxiety

- Some degree is totally normal
- Needs treatment if:
  1. Impairing recovery
  2. Preventing from living their life

- Treatment Options:
  1. SSRI
  2. Psychology for psychotherapy

- Special consideration: Bupropion to double dip depression and smoking cessation

Specific Activities

- Activities limited by function, less by stroke risk

- Typically mention no restriction of:
  1. Travel
  2. Sex*
  3. Exercise*
     1. Dissection is special circumstance: no heavy lifting or vigorous exercise fo 3-6 months afterward.

*Especially critical in RCVS or TGA which can be triggered by exercise or sex

Specific Activities - Driving

- Judgement Call
- Want approval from:
  - Patient
  - Caregiver
  - Provider
- Occupational Therapy driving evaluation
  - Vision deficit
  - Cognitive Deficit
  - Motor – if borderline
- Special case: CDL drivers – NO DRIVING FOR A YEAR
  - Professional truck drivers
  - School Bus Drivers