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**This is a sample from the neuro portion of the E-book only**

## **Neuro**

### **Vocabulary**

**Cranial nerves** – originate in brain stem (Ipsilateral function)

**Anosmia** – no sense of smell

**Apraxia** – can't perform acts or manipulate objects, can't carry out learned purposeful movements (Ex: Hold a glass)

**Decorticate** – flexion towards the cord, extension of lower extremities / rigid spine, arms flexed inwards, legs extended c plantar flexion (mid-brain, diencephalon)

**Decerebrate** – extension away from the cord, adduction & rigid extension of upper & lower extremities / rigid spine, extended arms & legs c plantar flexion (brainstem ischemia)

**Brudzinski reflex** – when neck is flexed, involuntary flexion of ankle, knee & hip (meningeal irritation)

**Babinski reflex** – draw a line (with back of pen) from heel of foot along to the metatarsals, normal response is plantar flexion of all toes / Dorsiflexion of great toe & fanning out of other toes is abnormal of anyone >2 y.o. ( (+) Babinski can be due to alcohol intoxication, after a seizure) It's a decrease of CNS

**Kernigs reflex** – pain in hamstrings & reflex contraction when leg is extended after the thigh is flexed (meningeal irritation)

**Rhomberg test** – if a pt sways c both opened & closed eyes ((+) Romberg), if just with closed eyes it's a cerebellum/proprioception problem

**Dolls eyes** – (aka Occulocephalic reflex) when head of a comatose pt is turned (R) or (L), eyes go toward the center of body or to opposite side / (-) Dolls eyes is mid-brain ischemia

**Cushings triad** – widening pulse pressure (↑systolic, ↓diastolic), ↓ pulse, change in RR (late sign of ↑ ICP) (brain stem herniation)

**Cold caloric reflex** – when cool water goes into the ear (into comatose pt) eyes move toward the irrigated side & return to mid position / (+) Cold caloric = intact brain stem

**Clonic** – alternating contraction & relaxation

**Tonic** – tension / contraction of muscles

**Convulsion** – paroxysm (sudden sharp attack) of involuntary muscle contraction & relaxation

**Aphasia** – inability to swallow / or use verbal language

**Dysphasia** – difficulty swallowing

**Hemiparesis** – partial paralysis / weakness of half of the body

**Hemiplegia** – paralysis of half of the body

**Paraparesis** – partial paralysis from waist down

**Paraplegia** – paralysis from waist down

**Quadraparesis** – partial paralysis of 4 extremities

**Quadriplegic** – paralysis of 4 extremities

**Autonomic dysreflexia** - ↑BP, ↓P, headache, visual changes, pale below injury, flushing & diaphoresis above injury. It's an emergency of autonomic nervous system. T1 – T6 injury. Due to noxious stimuli: full bladder or bowel, decubitus ulcers, treatment / manipulation of groin, perineum, rectum or external genitalia.

**Supratentorial** – above the tentorium

**Infratentorial** – below the tentorium

**Skeletal traction** – used to immobilize, position or align a fracture (through a metal pin, tongs or wires) **Cervical traction** = **Halo traction** or **Grutchfield tongs**

**Neurogenic shock** - ↓ BP, ↓ HR (secondary to vagal response)

**Laminectomy** – surgically remove spinal vertebrae (due to disk herniation, injury or compression)

**Motor / Expressive aphasia (Broca's aphasia)** – can't read, write or speak, but understands everything

**Sensory / Receptive aphasia (Wernicke's aphasia)** – can't understand speech or written word (but can speak)

**Global aphasia** – can't talk or understand

**Diplopia** – double vision (helps to wear a patch & rotate)

**Alexia** – can't read

**Agraphia** – can't write

**Agnosia** – can't recognize people, objects, sounds, shapes or smells

**Hemianopsia** – vision in half of the eye/ happens in (R) CVA (startles pt's, ability to sense that someone is approaching from the effected side is ↓)

**Hemonymous Hemianopsia** – vision on same side in both eyes is ↓

**Unilateral neglect** – disorder of attention, pt can't integrate & use perceptions of affected side & ignores that part; (R) strokes - & damage to parietal lobe (center of attention)

**Nystagmus** – rapid eye movement

**Photophobia** – sensitivity to light

**Akinesia** – complete or partial loss of muscle movement

**Bradykinesia** – slowness of movement

**Dyskinesia** – difficulty moving

**Resting tremor** – involuntary movement at rest (Ex: Parkinson's – do pill rolling to control it)

**Occulogyric crisis** – eyes roll upward & stay in that position (complication of Parkinson's, due to stress, drug toxicity or psych. illness)

**Flaccidity** – absence of muscle tone

**Spasticity** - ↑ muscle tone

**Brain stem** – regulates BP, Resp. (includes midbrain, pons & medulla)

**Cerebellum** – coordinates motor function, movement & balance

**Dementia** – effects memory, attention, language, problem solving

## Glasgow Coma Scale

**4 points Eyes** Spontaneously ----- 4  
 To verbal command-----3  
 To pain-----2  
 No response-----1

**6 points Motor** Obeys commands-----6  
 Painful stimuli-----5  
 Flexion withdrawal----4  
 Decorticate-----3  
 Decerbrate-----2  
 No response-----1

**5 points Verbal** Oriented & talks-----5  
 Disoriented & talks----4  
 Inappropriate speech---3  
 Sounds-----2  
 No response-----1

\*\*\* For the painful stimuli, apply a pencil to a nail bed, if pt doesn't respond than supraorbital pressure, than trapezeus neck squeeze, than you can do sternal rub (c gloves)

\*\*\* 15 = highest score  
 3 = lowest score  
 7 or > = comatose  
 8 = major injury  
 9-12 = moderate injury  
 13-15 = minor injury



## Cranial Nerves

- 1 **Olfactory** – smell
- 2 **Optic** – tests visual field, acuity (Snellen chart)
- 3 **Oculomotor** – lateral eye movement / pupil constriction / bright light / near vision / rotation / nystagmus / ptosis (lid elevation)
- 4 **Trochlear** – PERLLA / Doll's eyes / downward eye movement
- 5 **Trigeminal** – sensation of face, scalp, teeth (pain, cold, hot, dull, sharp) / contraction of chewing muscles / sensation of mucous membranes (nose & mouth) – clench jaw, feel masseter & temporal muscles, any difference in (R) or (L) side? / Corneal reflex (use needless syringe) – if no blink response use natural tears & close lids c tape / Lids – stroke each lid for a response
- 6 **Abducens** – EOM (Extraocular movements)
- 7 **Facial** – Corneal reflex & lids / pain & temp from ears / deep sensation of face / taste from anterior 2/3 of tongue (salty, sweet, sour) / muscles from face & scalp / lacrimal, submandibular & sublingual salivary glands (saliva) & swallowing / facial symmetry – ask pt to smile, raise eyebrows, sniff, frown, puff cheeks, close eyes against resistance (observe for placid paralysis) / facial expression
- 8 **Vestibulococlear** / **Acoustic** – hearing, equilibrium (assess c ticking watch or by whispering) / Cold caloric / Rhine test & Webber test
- 9 **Glossopharyngeal** – taste from posterior 2/3 of tongue / pain & temp from ear / gag reflex (muscles of soft palate, larynx & pharynx) / saliva / swallowing / sensory of cardiac, BP, resp / speaking
- 10 **Vagus** – pain & temp from ear / muscles & sensations of soft palate, larynx, pharynx / gag reflex (cough-strong or weak? / touch the back of both sides of throat, a unilateral loss may be noted) / saliva / cardiac, smooth muscle, nerves, resp, BP / ↓ HR / peristalsis (R/F constipation), digestive secretions / speaking
- 11 **Spinal Accessory** – contraction of neck & shoulder muscles (turn head against hand, shrug shoulders) – sternomastoid & upper trapezius muscles / speaking
- 12 **Hypoglossal** – tongue movement (stick out tongue, move it from side to side against resistance, if there's a weakness the tongue will deviate toward the strongest side)

## Headaches

**Tension headache** – (like the one you get right before a test) Tylenol, Motrin

### **Migraine c an aura** –

- 1) **Prodromal stage** – “aura stage” – aura can occur several min to an hour before the headache (Flashing lights, spots, lines = visual disturbances)
- 2) **Headache stage** – pain begins in the temple & continuously ↑ in intensity, throbbing, pulse pulsates like a heartbeat, maybe N/V
- 3) **Dull stage** – pain changes from throbbing to dull pain (lasts hours, days or weeks)

### **Migraine s an aura**

No warning, the pain is as severe as c an aura (may also have N/V), can be caused by: stress, PMS, fluid retention, MSG, chocolate, red wine, sausage, aged cheese, perfume, fumes (gas, paint)

**Treatment & prevention** – if h/o migraines – Beta Blockers (ex: Inderal) or Ca. Channel Blockers (Procardia, Calan)

- To treat: NSAID's (1<sup>st</sup>), than Fiorcet, than Imitrex (no Imitrex if CAD, causes vasoconstriction)

Non-pharmaceutical – sleep (↓ stimulation, lights out) / control noise, relaxation techniques

**Cluster headaches** – less common than migraines / comes in clusters, lasts hours to days

**S/S**: (besides headache) ipsilateral tearing (same side as headache) / rhynorrhea / congestion / pale or flushed face / pt sits & rocks, walks or paces

**Treatment**: Pain control / 100% oxygen (↓ cerebral flow)

## ↑ICP

\*\*\* Earliest indicator in change of LOC (assess for early signs before it gets worse)

\*\*\* It's subtle, like all of a sudden the pt. will get quiet or restless (hypoxia) --- means there's fluid in the brain & skull can't expand & presses against the brain

**Early S/S:** *sudden change in LOC / irritability / confusion / restlessness / increasing drowsiness / unrelieved headache*

**Late S/S:** *LOC → Coma / posturing (decorticate, decerebrate)-breath sounds compromise / cushings triad (widening pulse pressure, ↑systolic, ↓diastolic, ↓P, change in resp. status) / ↑MAP / papillary changes / babinski reflex / loss of gag reflex / facial palsy / facial drooping*

### **Treatment:**

HOB – 45 degrees

Head in midline position (head bet. pillows)

Keep normal body temp. (prevent shivering) = ↑ temp = ↑ cerebral blood flow (so Hyperthermic blanket)

↓ environmental stimuli – to relax the brain (no light, no noise, tell family to bring familiar objects, quiet, monitors can also be muted)

**Mannitol** – osmotic diuretic – use a filter needle, its an IV push (monitor I & O, if no output can cause rebound ICP) / if a pt has no more urine output & still has the problem = it's a problem monitor K & Na (Mannitol is not for cardiac pts)

Hyperventilate (which means to Hyperoxygenate) - PaCO<sub>2</sub> should be **27-35**

Medication induced coma (so that ICP doesn't ↑ we sedate) Propaphol or Phentanol

CO = 4-8L

Intubate (if necessary)

Stool softeners (straining increases ICP)

F&E management – if brain injury, pt can have damage to the pituitary gland = so Diabetes Insipidus, so give **Vasopressin** (c a Foley)

\*\*\*Pt might have a different personality after, so family will need lots of teaching

## TBI – Traumatic Brain Injury

### Risk factors:

18-34 age group / MVA (major cause) - ↑ blood alcohol levels contribute to MVA's / falls / occupational / assaults / gunshot wounds (male 3:1 female) / sports s protective eqpt.

### Classified as:

Penetrating / Open & Closed

**Closed head injury** – blunt injury that doesn't result in an open skull fracture

1) **Concussion** – brief loss of consciousness

**S/S:** *immediate loss of consciousness (<5 min) / amnesia of event / headache drowsiness / dizziness / possible brief seizure c transient apnea, ↓BP, ↓P, pallor*  
(Post concussion syndrome – persistent headache, dizziness, irritability & insomnia, impaired memory & concentration, learning problems)

2) **Contusion** – brain knocked up against skull & bruised (bruise is on the surface of the brain)  
Often accompanied by small, diffuse venous hemorrhage. PH decreases due top accumulation of lactic acid & ↓ O2 may hinder cell function

**Open head injury** – (caused by knife, bullet, baseball)

### Mechanisms of craneocerebral trauma

**Acceleration** – head struck by moving object (Ex: baseball)

**Deceleration** – head hits a stationary object (Ex: wall)

**Acceleration – deceleration** (Coup-counter coup) – head hits an object & the brain rebounds within the skull, 2 or more areas may be injured

**Skull fracture** – break in the continuity of the skull (↑R/F intracranial hemorrhage), can cause cranial nerve injury, allow bacteria to enter the cranial vault or CSF to leak out

- 1) **Linear** – simple clean break in the skull (↓ R/F infection) (subdural or epidural hematoma could underlie the fracture) it's a low velocity injury
- 2) **Comminuted** – bone crushed into fragments (high impact injury)
- 3) **Depressed** – inward depression of bone fragments (bone is pressed in) due to powerful blow to the skull. Dura may or may not be intact. Bone fragments may be penetrated into skull.
- 4) **Basilar** – occurs at base of the skull (linear, comminuted or depressed) CSF leaks from nose & ears = ↑ R/F infection

**If dura is disrupted:**

Periorbital ecchymoses – raccoon eyes

Battles sign – black & blue behind ears, ecchymoses over mastoid

Rhinorrhea – nasal discharge (blood, CSF)

Otorrhea – ear discharge (blood, CSF)

### **Hematomas** (in the brain)

- 1) **Epidural** – arterial bleeding (space bet. dura & inner table of the skull, characterized by lucid (conscious) intervals that last minutes, followed by momentary unconsciousness (if not treated = rapid coma)
- 2) **Subdural** – venous bleeding (space bet. dura & above the arachnoid) bleeding is more slow, but highest mortality rate.

### **Treatments:**

- Before the paramedics arrive to the scene, **DO NOT** move the pt
- **“Golden Hour”** – within the 1<sup>st</sup> hr, body can still compensate, so do all interventions to ↓ ICP
- When sending a pt home, instruct the family to wake the pt Q2H & check the LOC (usually, the pt has no recollection of what happened before or after the injury)
- Paramedics put on a Cervical Collar & put him on a Long Board (must R/O spinal cord injury)
- Airway - check ABC's (1<sup>st</sup>), if not breathing – Intubate (esp. if brainstem injury, than problem c breathing) / assess for Cheyne Stokes breathing
- Look for Cushing's Triad (=deterioration), however ↑ ICP can happen later on, so monitor ICP & V/S Q5-15 min
- If the pt is normal, than all of a sudden restless or quiet = deterioration
- After spinal cord injury is R/O – HOB 30 degrees
- Suction gently (not frequent or vigorous) hyperventilate for 10 sec. before / make sure pt rests before suctioning (it ↑ ICP)
- Keep PaO2 = 80-100 & PaCo2 at 27-35 (low) – if PaO2 rises – hyperventilate & increase O2
- Medication induced coma
- If CSF (means it's a severe head injury) – will see a clear yellow halo “halo sign” in the blood (if on the street use a gauze to check, if in the hospital check for glucose – glucose strip or litmus paper)
- Folly (need to measure I&O, 1<sup>st</sup> Q1h, than Q2h, than Q4h)
- Restrict fluids
- Do not cluster activities
- Early rehabilitation
- Meds: diuretics (Mannitol), anticonvulsants (Dilantin), vasoactive meds, barbiturates, steroids (Decadron), Carafate (mucosal barrier)
- Craniotomy – for ↑ ICP (Burr hole), drill a hole in the skull, put catheter in to measure the pressure, also serves as a gravity drainage (can also surgically evacuate a hematoma)
- No straining, gagging or fighting
- Monitor urine specific gravity (If pituitary gland is damaged, will see DI)
- In the hospital have altered nutrition, so PEG or NG tube

### **Diagnoses:**

#### **R/F Infection**

Monitor for rhinorrhea or otorrhea (test for glucose)

Keep nose & ear clean (piece of gauze in ear & tape cotton pad loosely under nose (change dressing when wet)

No blowing nose, no sneezing (sneeze through open mouth)

Strict aseptic technique (gauze & pad's are sterile)

#### **Ineffective Airway Clearance**

Assess neuro S/S on a regular schedule, any changes may indicate  $\uparrow$  ICP &  $\downarrow$  jugular vein outflow c R/F further resp depression & can lead to resp. arrest  
Maintain neck & head alignment (no head rotation, no neck flexion) – pt is immobilized until injury is determined (prevents spinal cord injury, which can depress resp.)  
Clear nose & mouth of mucous & blood / suction airway as needed (limit to 10 sec)

### **Ineffective Breathing Pattern**

Monitor resp. for rate, depth & rhythm Q2h (if pt is not on a vent)  
 Assess breath sounds (Cyanosis? Restlessness? Use of accessory resp. muscles?)  
 Monitor pulse-ox & ABG's  
 If not intubated, prepared O2 &/or tracheal intubation (if resp distress occurs)

### **Home care:**

**Go to ER if:** growing drowsiness or confusion / hard to wake (wake Q2h the 1<sup>st</sup> night home) / vomiting / blurred vision / prolonged headache / slurred speech / blood or clear fluid (from nose or ears) / weakness in arm or leg / stiff neck / seizure / uncharacteristically emotional / hard to pay attention or c memory / seems very tired

**Head injury complications** – herniation / infection / DI (monitor I&O)

## **Spinal Cord injury**

**Causes:** Age 16-30, mostly males & in summer time / MVA / falls / sports / acts of violence

**Complete** – spinal cord damaged, no nerve impulses below level of injury

**Incomplete** – could have some function below the level of injury (time tells, the swelling must go down 1<sup>st</sup>)

**Quadriplegia** – all 4 extremities (mid-upper thoracic to cervical = T6 and up)


**Paraplegia** – lower extremities (lower thoracic, sacral, lumbar = T7 and down)

### **Interventions:**

Stabilize neck & back (Cervical collar & long board)

Do not move the pt

ABC's (if damage to C3-C5 = pt is going on a vent)



Assess for hemorrhage

Glasgow coma scale & neuro check

Assess for brain injury

Psychosocial assessment (these pt's are young)

Halo (fixation device) (T6 and up) - 4 pins into head & fits into vest so that pt is unable to turn head side to side / make sure there's no ↓ in circulation (should be able to put 2 fingers bet. neck & vest)

Drugs: Solumedrol - ↑ dose, within 8 hours of injury

Atropine – for bradycardia

Dopamine – for hypotension (brings it up) – if spinal shock

Heparin or Lovanox (DVT prophylaxis)

Quadriplegics – cough & deep breathe, prevents pneumonia (pillow behind & in front & cough)

T&P pt / ROM / prevent foot drop (booties at night & sneakers at day)

Get up slowly (R/F orthostatic hypotension)

Bladder control – intermittent cath.

Bowel control – teach manual disimpaction

Bowel retraining program - ↑ fluid, ↑ fiber, Colace

**Diagnostics:** CT scan or MRI

**Spinal shock** (aka neurogenic shock) – lasts days to months (it's a disruption in communication pathways bet. upper motor neurons & lower motor neurons)

**S/S:** *flaccid paralysis / loss of reflex activity below the level of lesion / ↓BP / ↓P*

**Autonomic dysreflexia** (usually happens c T6 & above injuries) neuro emergency, could have hypertensive stroke (due to: noxious stimuli, strong smell, fecal impaction, constipation, change in room temp., urine retention) So pt must be disimpacted

**S/S:** *rapid ↑ BP, ↓ P / severe headache / flushing above lesion / sweating / nausea / blurred vision*

## CVA – Stroke

**“Brain attack”**

#1 neuro problem in US

Sudden loss of brain function – from disruption of blood supply to part of brain

Temp. or permanent dysfunction (loss of movements, thought, memory, sensation)

**So if someone feels numb, tingling in one arm, can't talk – it's a medical emergency**

## 2 TYPES

**1) Ischemic** – blood supply to part of brain is interrupted by thrombus or embolus

Thrombus – gradual onset, usually in neck vessels (Carotid artery) stays & blocks blood flow (most strokes) / atherosclerotic plaque & pressure is increased

Embolus – sudden onset, it's a traveling clot (piece of the thrombus breaks off & travels)

**2) Hemorrhagic** – when a b.v. breaks open & blood spills into spaces surrounding nerves

**Risk factors:** *>65 / > in Afric. Americ. / HTN or Hypotension / DM (↑ R/F HTN) / Sickle cell (↑ viscosity, erythrocytes clump & occlude small cerebral vessels) / alcohol / nicotine / heroin / cocaine / amphetamines / Atherosclerosis / obesity / sedentary lifestyle / hyperlipidemia / A. Fib. / Cardiac disease / previous TIA / oral contraceptives / hormone replace. therapy*

**Prevention** – 81-325 mg. Aspirin/day (Males >50 & females after menopause)

- ▷ When blood flow & oxygenation are **↓** or interrupted, trouble begins in 4-5 min. / severe or prolonged ischemia leads to cellular death
- ▷ Contralateral deficit – loss or impairment of sensory-motor function on the side that's opposite to the side of the brain damaged

## TIA

Brief period of localized cerebral ischemia, causing neurological deficits / it's transient / it's a warning sign / deficits may last for minutes or last for a few hours / sudden onset

**Causes:** inflammatory artery disorders / sickle cell anemia / atherosclerosis / thrombosis or emboli

**S/S:** *facial paralysis / contralateral numbness / other paralysis / weakness of arm, corner of mouth / aphasia / visual disturbances (blurring, double vision) / blindness in one eye / ataxia / dizziness / unilateral numbness / tingling / slurred speech / dysarthria / dysphasia*

- ▷ Pt needs to find out the cause
- ▷ There are no residual deficits, 100% recovery
- ▷ The key is prevention (Diabetes, HTN)
- ▷ **Surgery** – **Carotid Endarterectomy** – removes sclerotic plaque from lining of artery (to have free blood flow) Risks – can shoot a clot (embolus), but 1<sup>st</sup> stabilize S/S

## Thrombotic stroke

Occurs when resting or sleeping (BP is lower during sleep, so there's less pressure to push blood through an already narrowed artery)

Occurs rapidly (progresses slowly), begins c a TIA & worsens over 1-2 days =

### Stroke in Evolution

Maximum neuro deficits are reached by 3 days = **Completed Stroke**, by then the area is edematous & necrotic

### **Embolic stroke**

Seen in younger pt's; occurs when **awake & active**  
Sudden onset & immediate deficits

### **Hemorrhagic stroke** (aka intracranial hemorrhage)

Occurs during **activity**, when cerebral b.v. ruptures (most lethal & fatal)

↑ Pressure in artery, until it bursts

Directly related to HTN & Cerebral aneurism, erosion of b.v. by tumor or anticoagulant

Rapid onset

**S/S**: vomiting / headaches / seizures / hemiplegia / loss of consciousness / ↑ ICP ⇔ coma & death (but S/S can vary according to area of brain involved & artery involved)

**S/S of all strokes**: weakness in face, arm, leg / numbness on one side / visual disturbances / loss of vision / blurred vision (in one eye or to the side) / homonymous hemianopsia / speech difficulties / balance problems / difficulty walking / loss of consciousness / drooling / facial drooping / seizure (esp. c Hemorrhagic) / incontinence / proprioception problems / language disorders / sudden headache / behavior changes / hemiplegia / hemiparesis / flaccidity / spasticity

### **Complications of a stroke**

**Immobility** (causing orthostatic hypotension, ↑ thrombus formation. ↓ CO, impaired resp. function, osteoporosis, kidney stones, contractures, decubitus ulcers)

**Elimination** – frequency, urgency, incontinence, change in bowel elimination

**Visual disturbances** – hemianopsia, homonymous hemianopsia

Agnosia, apraxia, spatial & proprioceptive dysfunction, aphasia, dysarthria

Cognitive & behavioral changes – mild confusion to coma

Emotionally labile (laughs or cries inappropriately)

Loss of self control (cursing or doesn't want to wear clothing)

***Memory loss, ↓ attention span, poor judgment, hostility, frustration, ↓ cooperation, can't problem solve or make decisions, headache, dizziness***

▷ **Frontal lobe** – learning, memory, intellect, attention span, comprehension, motivation

▷ **(R) Sided stroke** – affects proprioception, visual & spatial awareness, unilateral neglect (ignore (L) side of the body, so a nurse must constantly reinforce it) ↑ R/F Injury, have Hemianopsia, disoriented to time & place, impulsive, poor judgment, get up quick

▷ **(L) Sided stroke** – it's the center for language, math & analytical thinking, aphasia, alexia, agraphia, slow & cautious

### **What to do if S/S of a stroke:**

1<sup>st</sup> 72 hours - ↑ risk period

V/S, GCS, HOB-30 degrees (↓ ICP)

No clustering of nursing activities

Hyperoxygenate (before, during & after suctioning)

Headaches (so quiet the environment)

Photophobia (so turn off bright exam lights)

BP at 150/100 (don't let it fall below, we want to keep tissue adequately perfused, and don't want BP going up or down)

### Diagnostics:

Physical & neuro exams

CT scan - distinguishes type of stroke (Ischemic (-) scan, Hemorrhagic (+) scan)

MRI – detects shifting of brain

Transcranial Ultrasound Doppler – evaluates velocity of blood flow

PET – checks blood flow & metabolic activity in brain

### Management:

TPA (Thrombolytic therapy) – for this, a thrombotic stroke must be witnessed, because it can only be done within 3 hours / reverses effects of CVA, but can cause massive hemorrhage (dissolves cerebral artery occlusion, prevents cerebral infarction)

Excluded pts: stroke or head injury within 3 months, pregnant, hemorrhagic stroke, recent MI, anticoagulated ( ↑ PTT)

Post-TPA: V/S Q15 – for 2 hrs / Q30 – for 6 hrs / Q1h – for 16 hrs

BP - Systolic <180, Diastolic <100

Monitor for bleeding (H&H)

Fluids (I&O)

Neuro assessment Q4h – R/F ↑ ICP 1<sup>st</sup> 72 hrs

Manage ↑ ICP

Total ADL care

HOB – 30 degrees

Head in midline position

No extreme hip & neck flexion

No clustering care

Hyperoxygenate before suctioning (no suctioning >10-15 sec

Quiet environment, lights low

Monitor Resp. & airway patency

Monitor ABG's

Monitor cardiac for dysrhythmias (murmurs & A. Fib)

Monitor temp, I&O (DI may develop)

Monitor for seizures (pad rails, give Dilantin)

### Meds

Antiplatelets (Ex: Aspirin 81 mg. – 162 mg. if >150 lbs) treat TIA's or if previous stroke / doesn't resolve formed clots, but prevents formation of new clots (never given if hemorrhagic stroke) (Anticoagulants are also Plavix (no food ↑ in vit K), Persantine, Trental, Ticlid)

Heparin – Ischemic stroke (also prevents further clots)

Coumadin – contraindicated c ulcers, uremia, hepatic failure, no food ↑ in vit K (leafy green vegetables), no contact sports, bleeding precaution, routine blood work (make sure Coumadin level is not too ↑)

**Ca. Chan. Blockers** – treats cerebral vasospasm (Nimotop)

**Corticosteroids** – treats cerebral edema (Prednisone or Dexamethasone)

**Mannitol**

**Dilantin** – if seizures

**Streptokinase** – if not doing TPA (drug used for the same purpose), followed by Heparin drip, than Coumadin to ween off

**Colace** – if don't want pt to strain

**Ativan** – for anxiety

**Pain meds**

**Surgery - Carotid Endarterectomy** (see TIA)

**Diagnoses:**

**Ineffective Cerebral Tissue perfusion**

**After a stroke:**

- ▷ Before feeding, assess gag reflex (nutritionists do speech & swallow test)
- ▷ If pt has difficulty swallowing liquids can use Thick it
- ▷ Potential complications: DVT / ↑ ICP / Seizures / Hypoxemia / Atelectasis / Pneumonia
- ▷ If Expressive aphasia – yes/no questions only


**R/F Aspiration** – place food on unaffected side / check for food left in the mouth (pt can aspirate & choke) / when established already, CNA can feed the pt, instruct well, make sure CNA understands instructions / put fingers lightly on each side of the throat & ask pt to swallow & you will feel movement / HOB 90 degrees when feeding / HOB 30 degrees after meal / pt should be on schedule for bowel & bladder training (after meals)

**Impaired Physical Mobility** – encourage active ROM for unaffected extremities & passive ROM for affected extremities Q4H (support joint during passive ROM) (Passive ROM doesn't strengthen muscles, just maintains joint stability & flexibility) Turn Q2H (support c pillows) / monitor lower extremities for thrombophlebitis / Assess ↑ warmth & redness in calves, measure circumference of calves & thighs – R/F DVT / Maybe splint on hand to keep it straight / Prevent foot drop (sneakers at day, booties at night) / they may need to learn how to walk again, how to compensate for benefits, overcome unilateral neglect

**Self Care Deficit** – encourage use of unaffected arm to bathe, brush teeth, comb hair,

dress, eat (promotes independence) / put clothing on affected area 1<sup>st</sup> & than dress the affected / Encourage use of assistive devices

**Impaired Urinary Elimination & R/F Constipation** – assess for frequency, urgency & incontinence / encourage voiding training (voiding Q2h) / Kiegel exercises (contract muscles like you're stopping urination, hold contraction for 5 sec & release / Fluids – 2000 ml/day & ↑ fiber / ↑ physical activity (as tolerated)



Colace, ↑ fiber, antidepressants / at home – grab bars in shower, no scatter rugs, no skid pads

Reorient due to confusion (calendars & clocks)

Always tell them who they are & where they are

Tell family to bring stuff from home

Speak clearly & slowly (not loudly) (writing tablets & picture boards are helpful), allow enough time for pt to respond (**Impaired Verbal Communication**)

Use short & simple statements & questions (If you don't understand something, say so)

Meals in common dining area (not alone), they must be supervised (may choke to death)

Teach to chew well, no talking or drinking while eating (**Impaired Swallowing**)

Eat upright, c neck slightly flexed / Pureed or soft food

Check mouth for “Pocketing” on affected side

Have suction available (in case of choking or aspiration)

▼ Distractions

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