

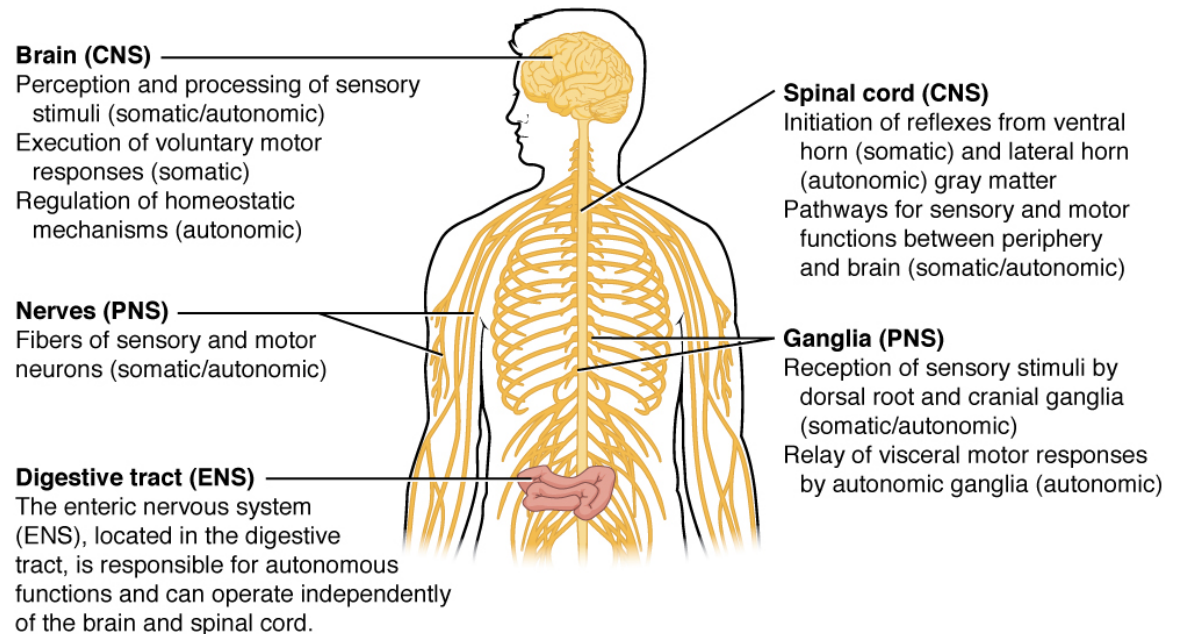
Neurological Disorders

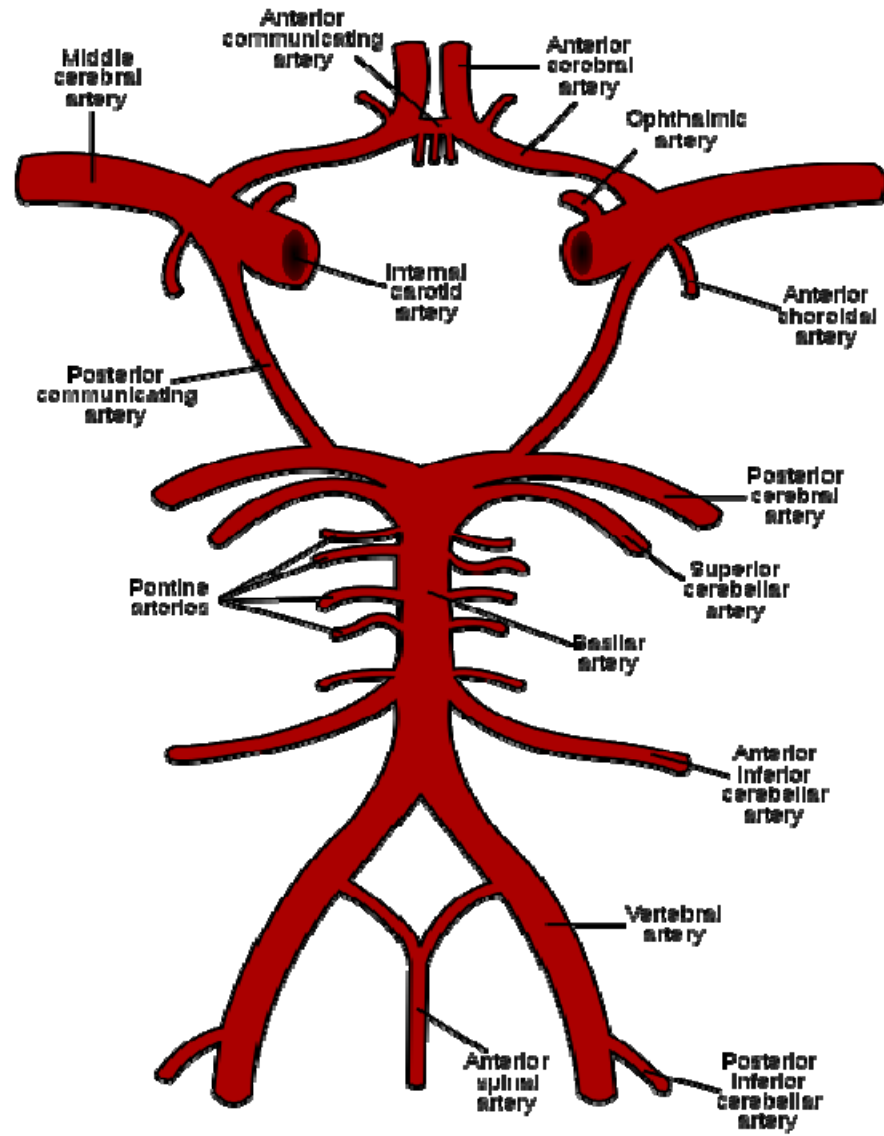
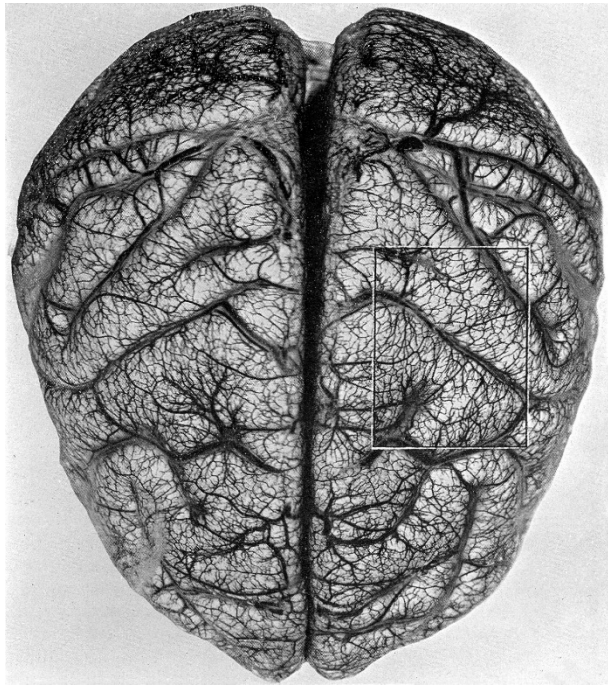
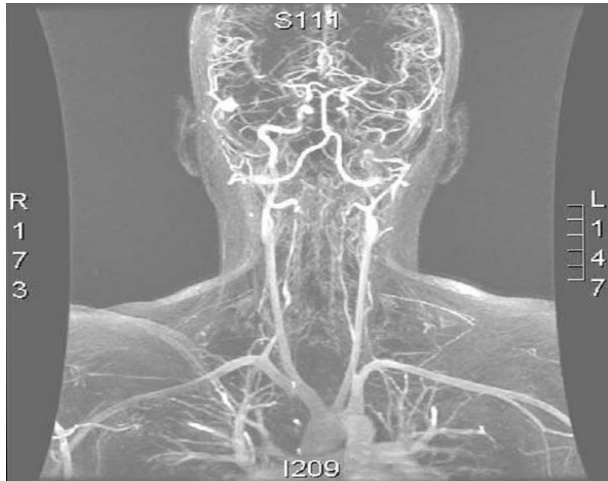
CAA108

Lisa Bowerman
Janelle White

A & P Review

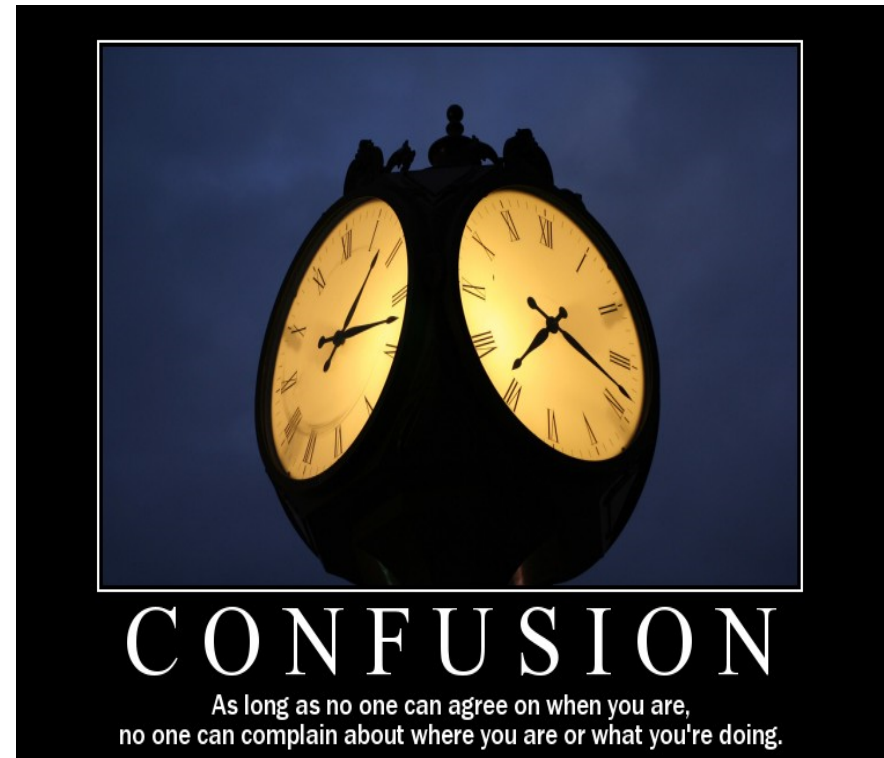
- Basic Functions of NS
- NS – 2 divisions...
- CNS...
- Brain...
- Blood supply...
- BBB...
- RAS...
- Spinal cord...
- PNS...





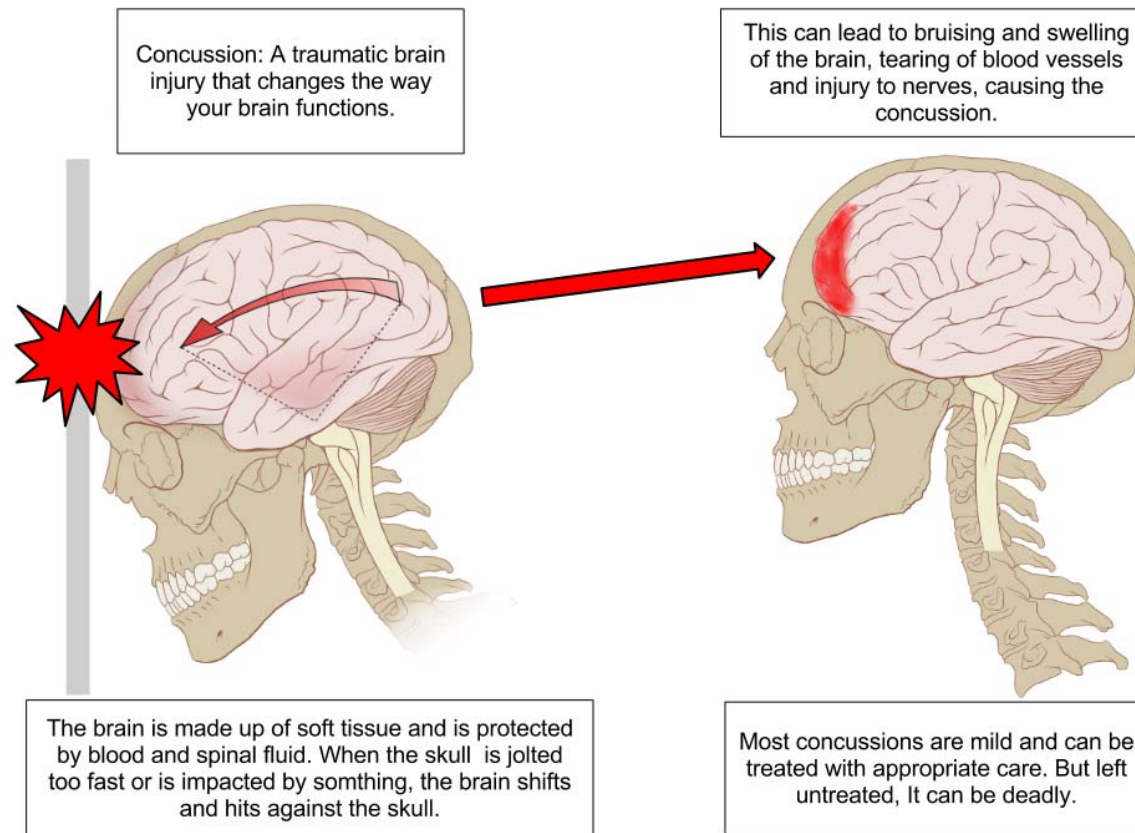
Altered Mental State (AMS)

- Definition?
- How do we determine if our patient has an AMS?
- What tools do we have to use?



AMS

Concussion



Fully reversible brain injury that does not involve any bruising or structural damage to the brain.



- Mild to moderate impact to skull
- Brief LOC (< 5 min)
- Temporary disturbance of function
- ? Mild Retrograde amnesia
- Drowsiness, irritability, confusion.
- True concussion – does not get worse!

Unconsciousness: the ultimate AMS

Definition...

“What’s *blood* got to do, got to do with it!”

4 Broad Causes:

- Blood oxygenation problems?
- Blood circulation problems?
- Metabolic problems?
- CNS problems?



May be a combination, such as?

The Greedy Brain

Glucose

Oxygen



- A – Alcohol?
- E – Epilepsy?
- I – Insulin?
- O – Overdose/Oxygen?
- U – Underdose/Uraemia?
- T – Trauma/Temperature?
- I – Infection?
- P – Poisoning/Psychosis?
- S – Stroke/Shock/Structural?

Scenario #1

C/T 79 year old male - collapsed. *Thoughts?*

Upon arrival you are greeted at the door by an anxious wife stating that she cannot wake her husband.

You walk to the back bedroom and find an elderly man lying in bed. As you enter the room, you can hear his gurgling respirations.

What are your initial actions?



Primary Survey

No detectable 'dangers'

Response – patient opens his eyes to your voice. Unable to communicate or speak.

A – airway

B – breathing

C – circulation

D – disability /dysfunction

E – exposure/environment

F – focused history & adjuncts

Secondary Survey

Designed to identify & rectify other injuries/illness not identified in the primary survey.

- ◆ Head to toe examination – ask and you shall find!
- ◆ Take the history (from relative)
 - ◆ What questions will you ask?
- ◆ Reassess what?
- ◆ Do you have an DDX and illness script in mind?



S & S

F.A.S.T

Decreased LOC

Unequal pupils

Facial droop

Inability to speak

Paralysis (hemiplegia)

Loss of bladder control
(incontinence)

Other S&S not necessarily
presented in this case.....



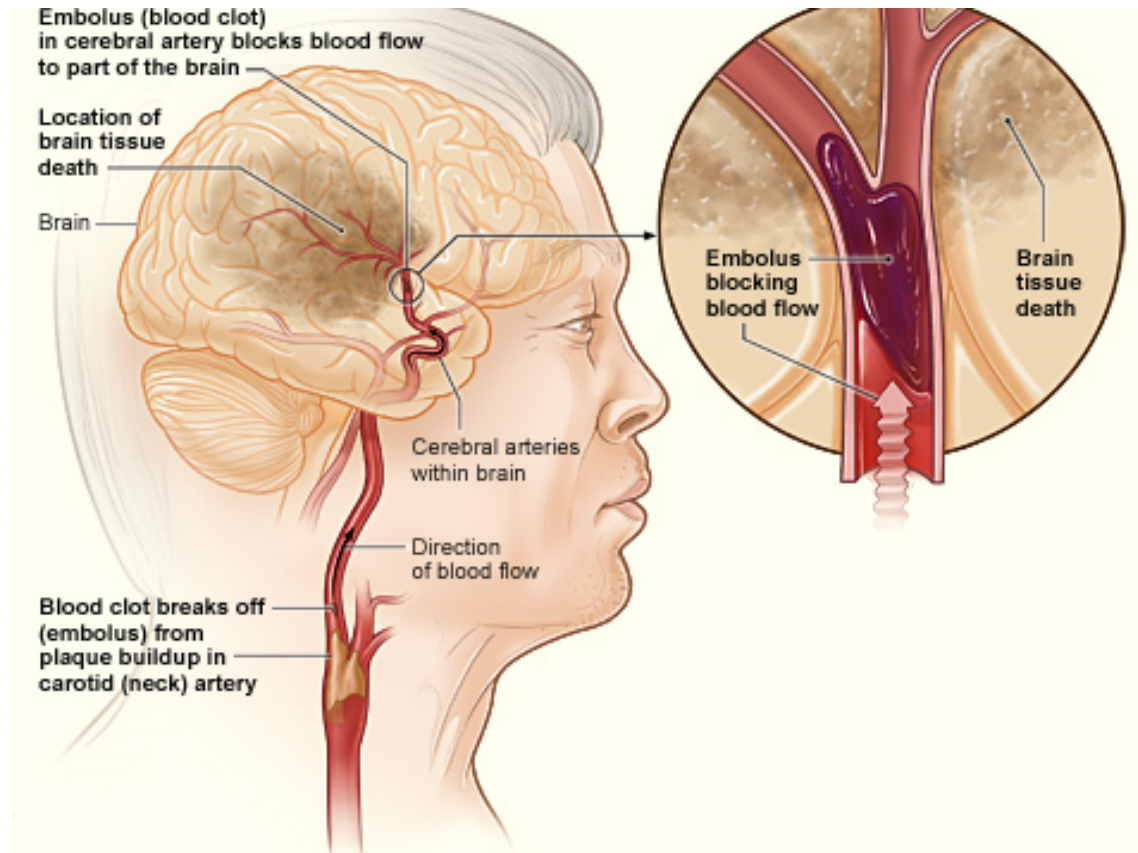
Pathophysiology of CVA or 'Brain Attack'

- Caused by an interruption of blood supply to the brain
 - Atherosclerosis is usually a contributing factor to clot formation & narrowing of cerebral arteries
 - Blockage → Ischaemic Stroke
 - Rupture → Haemorrhagic Stroke

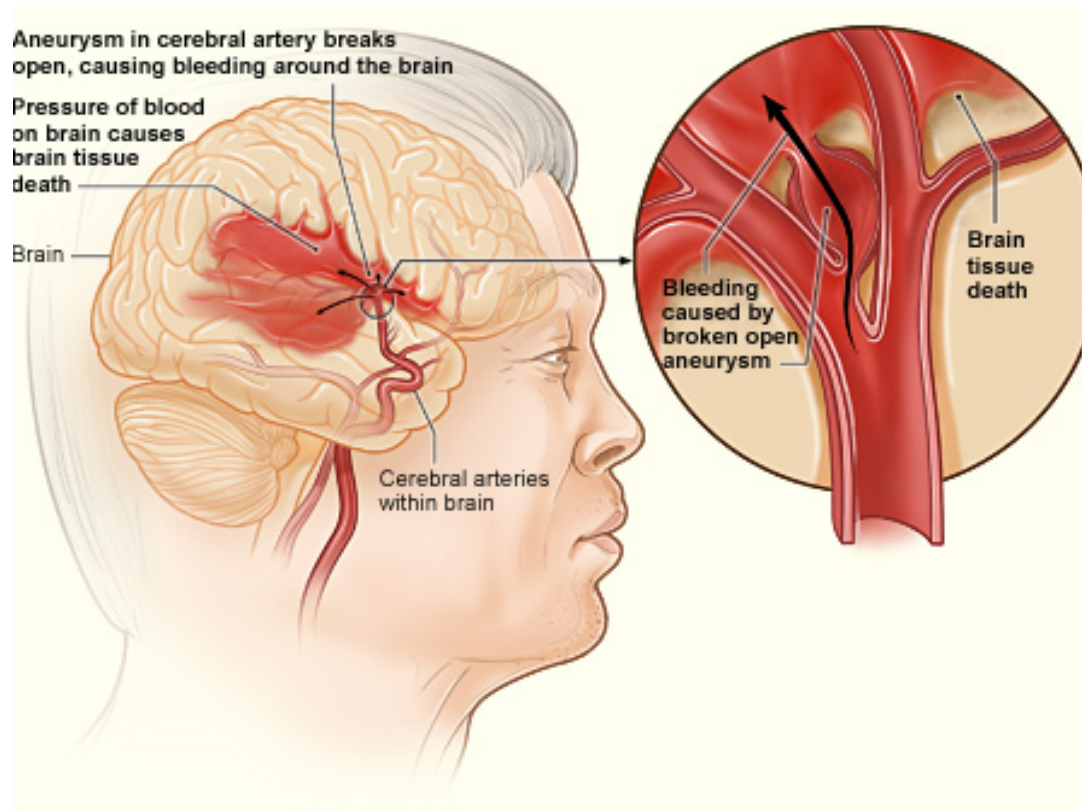
Stroke - 'The Window'

Ischaemic Stroke (around 80%)

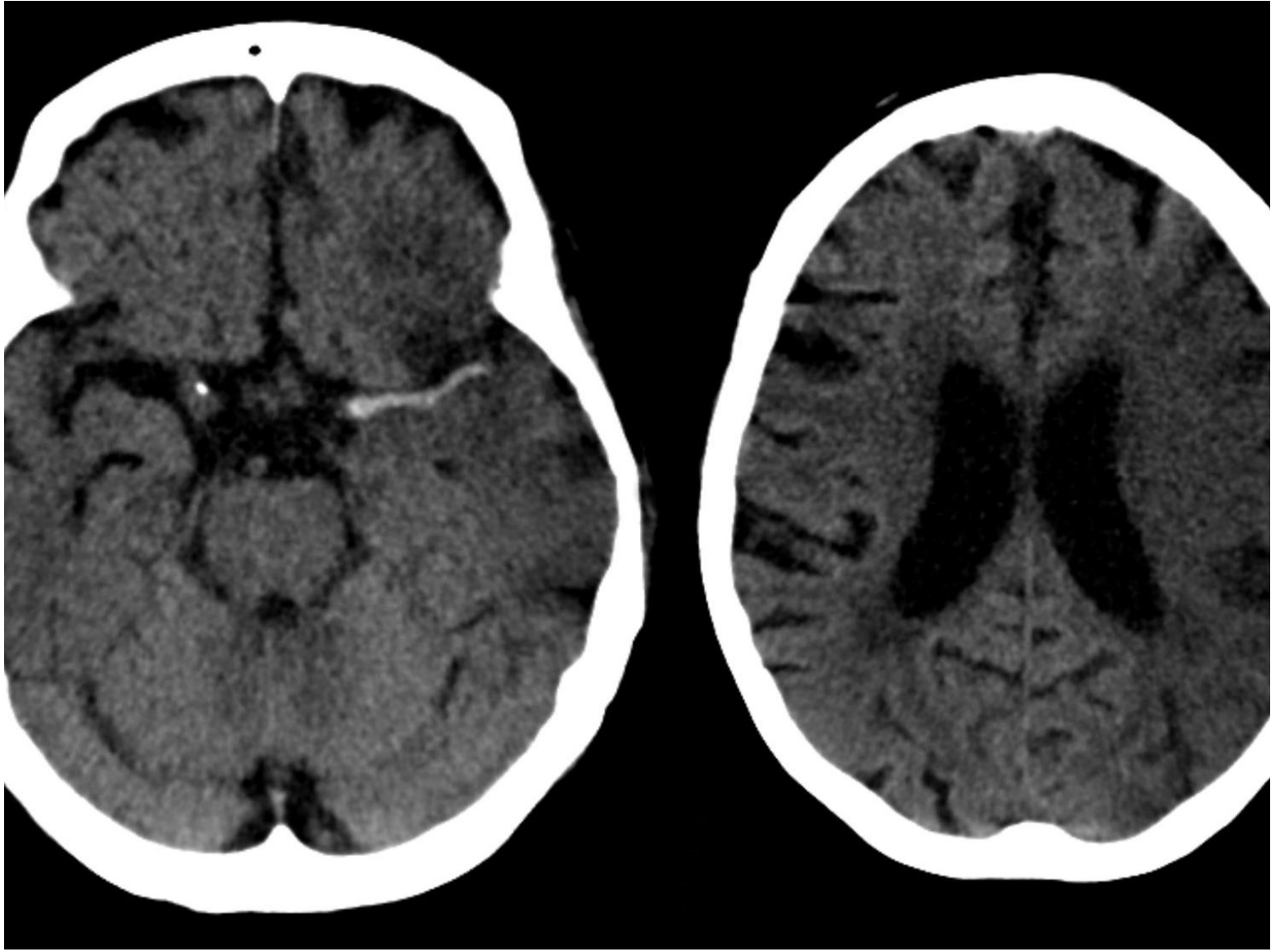
- Cerebral artery is blocked by a clot or other foreign matter
 - Thrombotic stroke (most common type)
 - Embolic stroke



Haemorrhagic Stroke



- Rupture of an artery causing bleeding within the brain ICH or in the space around the outer surface of the brain SAH
 - Often associated with hypertension
 - Subarachnoid (SAH) often associated with aneurysms
 - SAH commonly due to trauma



Differentiating CVAs

- Can only be done in hospital...
- Hospital diagnosis essential to treat correctly....
 - Ischaemic stroke → fibrinolytics (clot busters)
 - *What would happen if you gave this to a patient suffering from a haemorrhagic stroke?*

3 things we must do is!

- *Recognise, Notify, Transport!*

CVA Vs TIA

- What is a TIA?
- CVA Vs TIA?
- How to treat CVA/TIA?
 - Usually very frightening for the patient and family
 - Primary & secondary survey as usual
 - Reassurance +++
 - Reassess
 - *Supplement with O₂ **only** if Sats <95% - **Why?***

Scenario #2

You are called to a 32 year old female complaining of severe headache in an 'office' in the CBD.



DRABCDE – Primary Survey

The patient is lying down on a couch. When you approach her, she opens her eyes and states...

“Thank goodness you’re here, I can’t take this pain anymore”.

While doing your primary survey. What questions do you want to ask?

Primary Headache Disorders

- **Can have vascular, muscular, and nerve aetiologies**

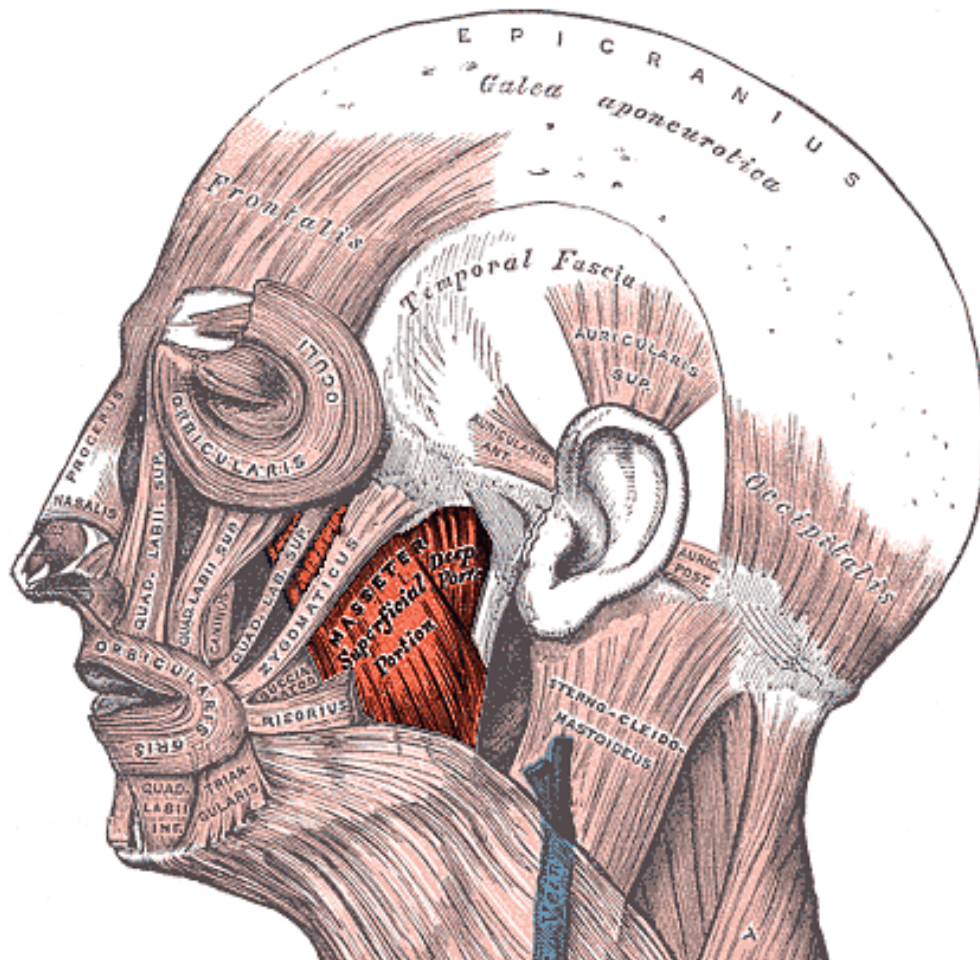
3 Main Primary

- **Migraine**
- **TTH**
- **Cluster**

According to the WHO 35 types! Within the Primary and Secondary categories.

MIGRAINE - International Headache Society criteria
Should have 2 from column A and 1 from column B

Column A	Column B
One-sided headache	Nausea and Vomiting
Throbbing	Sensitivity to light and sound
Moderate - Severe and restricts function	
Worsened by activity	



TTH
(Tension Type
Headache)
The most
common!

Serious Causes of Headaches

- Brain tumour
- SAH
- ICH
- Meningitis
- Hypertension
- Hypoglycaemia
- CO poisoning, other toxic inhalation
- Fever
- Hypoxaemia
- Stroke
- Depression



Headache Symptoms to Take Seriously

- Persistent headaches that progressively worsen over days or weeks
- Headaches that start suddenly (especially important if never had them before and over 50 years old)
- Headaches that come on suddenly **after** coughing, straining, or exertion
- Changes in vision, double vision, increased weakness, or loss of sensation
- Confusion or changes in memory, personality, or behaviour
- General weakness, numbness or slurred speech
- A stiff neck with a fever or a rash, or a seizure
- An unexplained fever or breathing problems (i.e. shortness of breath), which accompany the headache
- A sudden or dramatic change in the severity of your headaches
- Headache after a head injury or accident, or after a sore throat or respiratory infection
- A constant headache with no relief
- Persistent or severe vomiting
- Experiencing three or more headaches a week
- Use of a pain reliever every day or almost daily to relieve headache symptoms
- A very sudden and excruciating headache unlike any ever before

Management

- Symptomatic treatment – PAIN relief!?
Options...
- Position of comfort – lights/noise
- Beware pt. deterioration.
- Consider (warning signs/serious causes)
- REASSESS!
- Which observations will be particularly important?

Scenario # 3

- You are called to the local cricket ground to a 29 year old male pt having a ?seizure
- You find your pt lying on his side?
- As approach you note there are no dangers



Primary Survey reveals....

- Pt unresponsive to verbal stimuli
- Pt withdraws from painful stimuli
- RR – 14 & deep, note loud snoring
- Pulse - 112
- Skin pink, warm, moist

Bystanders provide the following information

“One minute he was playing cricket when all of a sudden he collapsed to the ground and began shaking all over”.



What Q's and what pt. observations will be important?

Secondary Survey

You begin your head to toe assessment...

- NAD
- Pupils – PEARL (slightly dilated...why?)
- Patient starts to stir, moving all limbs, looking about. Seems dazed.
- What do you do now?

Post Ictal

5 minutes later...

- Pt now alert and oriented.
- Pt states he has was diagnosed with epilepsy 10 years ago.
- Normally takes Tegretol and Epilim but ran out of Epilim 2 days ago.

–Thoughts so far??

- While talking he begins to have another seizure...
 - What do you do now?

Back to our patient who is seizing...

ABC's of Seizure Treatment:

- A – AIRWAY *Arrange protection/remove dangers?
- B – BREATHING *Be prepared to give medication?
- C – CIRCULATION *Consider/treat associated conditions?
- D – DISABILITY *Determine patient disposition?
- E – EXPOSE *Epileptic or not?

- **Approximately 1 in 120 people have epilepsy and up to 5% of the world's population may have a seizure at some time in their lives.**
- **Anyone can be affected by seizures at any age, most frequently diagnosed in infancy, childhood, adolescence and old age.**
- **Epilepsy is diagnosed when the seizures are unprovoked and recurrent – in other words they happen more than once.**
- **It is estimated that around 50 million people in the world have epilepsy at any one time. Incidence in developing countries is almost double that of developed countries.**
- **Approximately 70% of people who have epilepsy surgery become seizure free.**
- **Treatment options for people who cannot get seizure control with medications include Vagus Nerve Stimulation and the Ketogenic Diet.**
- **Epilepsy is a condition of the brain, not a mental illness.**
- **People with epilepsy can obtain a driver's licence if their seizures are controlled by medication or if they fulfil the guidelines set out by the driving authorities.**
- **There are around 40 different types of epilepsy and epilepsy syndromes and is not necessarily a lifelong disorder.**
- **Epilepsy is associated with an increased risk of death. (SUDEP)**

The A-Z of other causes of seizures

- Abnormal levels of sodium or glucose in the blood
- Brain infection, meningitis
- Brain/Head injury
- Brain tumor (rare)
- Drug abuse
- Eclampsia
- Electric shock
- Fever (particularly in young children)
- Heat stroke
- Idiopathic seizures
- Illicit drugs, such as angel dust (PCP), cocaine, amphetamines
- Kidney or liver failure
- Phenylketonuria (PKU), which can cause seizures in infants
- Poisoning
- Stroke
- Very high blood pressure (malignant hypertension)
- Venomous bites and stings (see snake bite)
- Withdrawal from alcohol
- Withdrawal from certain drugs, some painkillers, benzodiazepines, valium

→ MEDICAL EMERGENCY

“Status Epilepticus (SE)”

CSE, NCSE & RSE

- CSE = Convulsive seizure that lasts for > 5 minutes or 2 or more consecutive seizures without return of consciousness between (More critical)
- NCSE = Non-convulsive change in mental state from baseline for >30 minutes evidenced on EEG
- RSE = Refractory seizure activity that continues post AED therapy – considered when continued AMS

A note about Febrile Seizure

- Caused by sudden high fever often $>39^{\circ}$ C
- Most common in children 6 months to 6 years
- 5% of febrile children will have seizure
- Secondary Seizure
 - Often short and may not require emergency care
 - Reassurance is essential
 - Does not mean child is or will become an epileptic
- These seizures will be covered in Paediatric subject next year.



It's a hot summers day at 1500hrs, when you are called to a person collapsed at the local RSL.

What provisional diagnosis is going through your mind?

What do you do when you arrive on scene?

Scenario # 4





Primary Survey

- Nil Danger noted
- Responds to verbal command- however seems a little vague
- Responds appropriately when you ask who and where she is.
- RR – 22 regular, nil dyspnoea
- Weak radial pulse 102, regular
- Skin cool, moist, pale.
- TESTS?
- THOUGHTS?
- QUESTIONS?

Pt states she got up to go to the toilet and the next thing she remembers is everyone standing around her...

- Never happened before.
- Medications – Metoprolol
& Lasix (furosemide)
- Nil allergies
- Played bowls all morning.
- Too hot to eat much lunch.

- DIAGNOSIS??
- THOUGHTS??

Syncope

- aka 'Fainting'
- Sudden & temporary loss of consciousness.
- Temporary lack of blood flow to the brain and the brain is deprived of O_2 for a brief period.
- Peripheral Nervous System frequently to blame

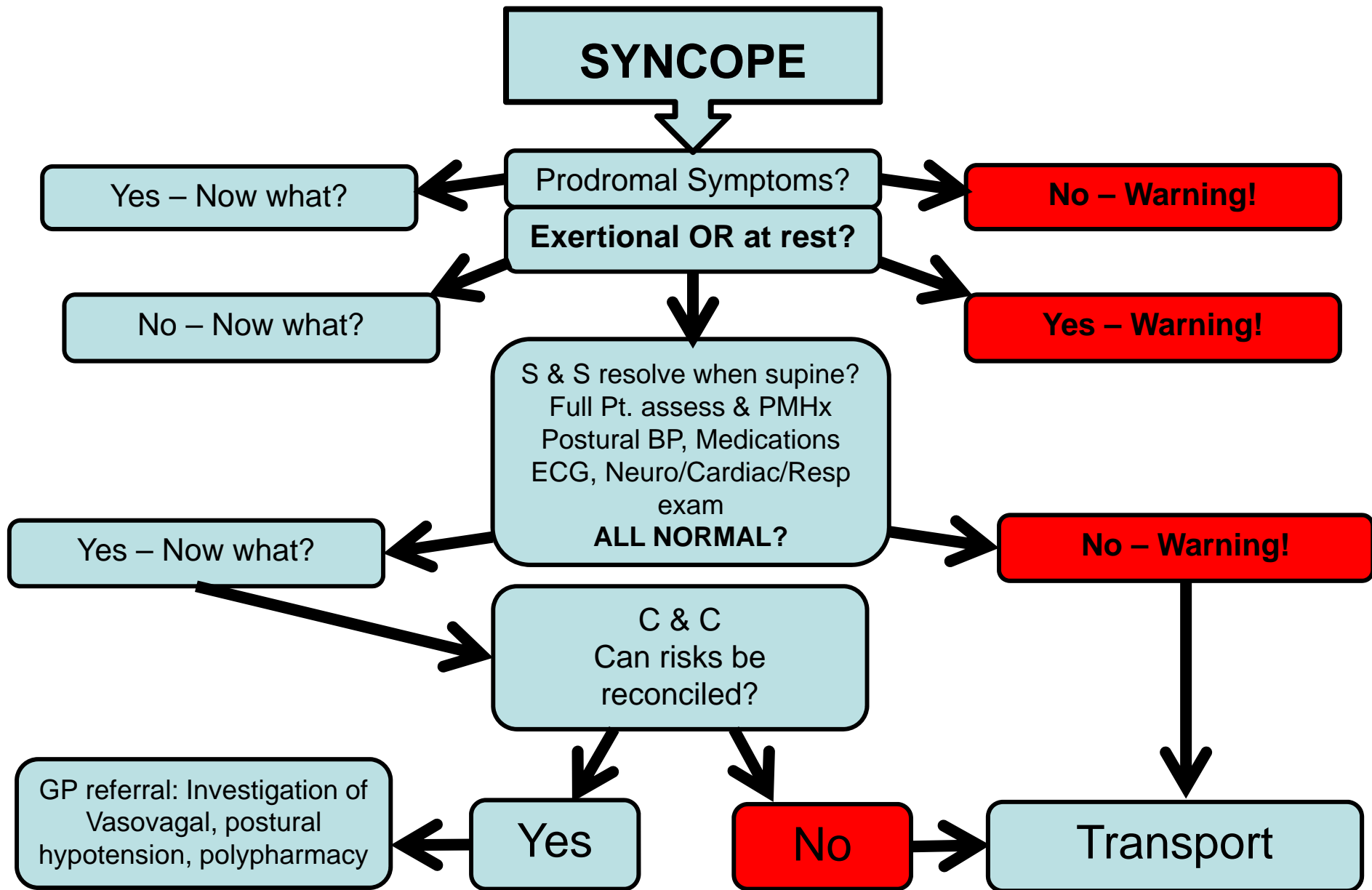
S &S of Syncope

- Anyone experienced a syncopal episode?
- How would you or the patient describe it?
- Dropping like flies...

Assume the Worst

Use your clinical decision making skills... if something does not 'seem right' assume the worst ...

What are other serious causes of syncope?



Drugs & Syncope

Associated with LQTS & V-Arrhythmias: (Antiarrhythmic, gastric motility promoters, Antibiotics) quinidine, sotalol, amiodarone, procainamide, erythromycin, haloperidol, tricyclic antidepressants.

Associated with Bradycardia: (Beta-blockers, Na channel blockers) verapamil, diltiazem, digoxin.

Associated with Postural Hypotension: (Anti-hypertensive drugs, anti-Parkinson and diuretics) prazosin, Ca channel blockers, furosemide, nitrates.

7 common Prodromal S & S

1. Diaphoresis
2. Pallor
3. Nausea
4. Palpitations
5. Visual disturbance
6. Hearing disturbance
7. Dizziness



'The Syncope Mnemonic'

P – Pressure (vasovagal, orthostatic)

A – Arrhythmias (brady, tachy, blocks)

S – Seizure

S – 'Sugar' (hypo/hyperglycaemia)

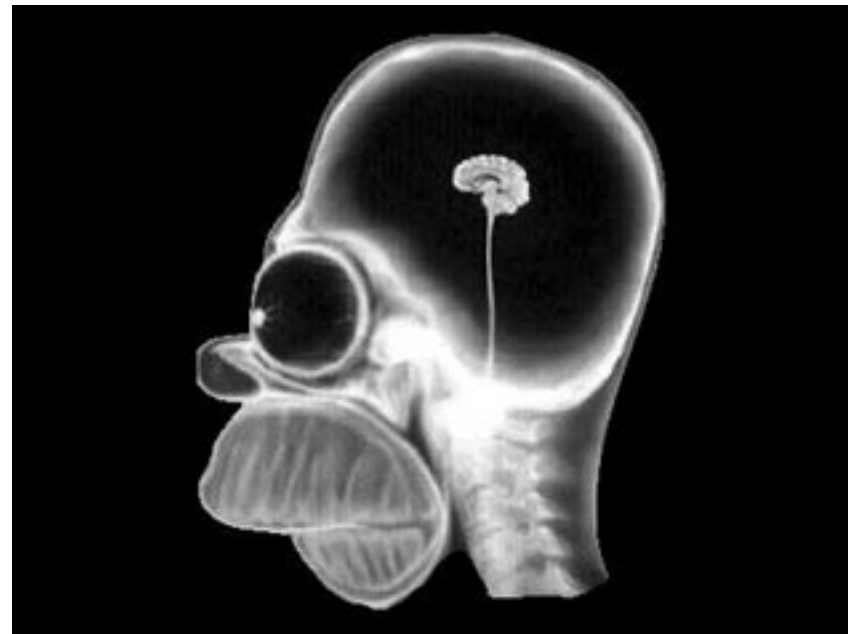
O – Output (cardiac/oxygen)

U – Unusual (anxiety/hyperventilation)

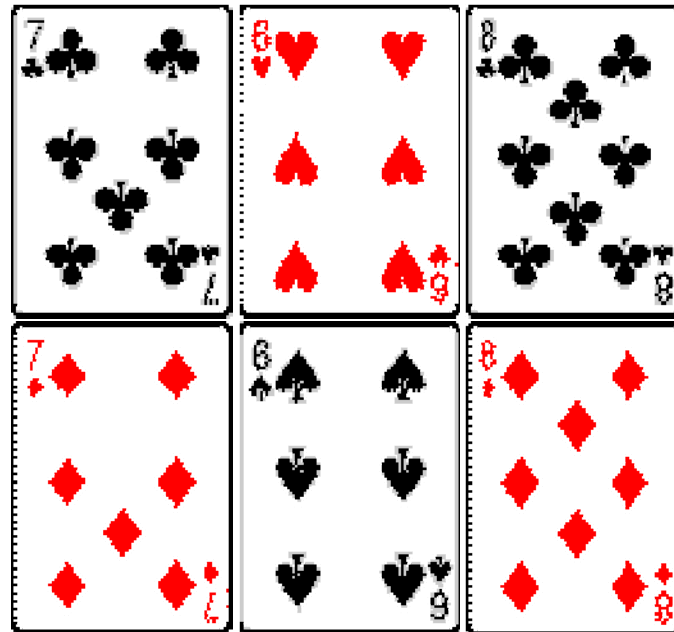
T – Transient Ischaemic Attack/CVA)

What have we covered...

- Review Neurological A & P
- Pathophysiology
 - AMS
 - Unconsciousness
- Common neurological conditions
 - CVA/TIA
 - Headache
 - Seizures
 - Syncope

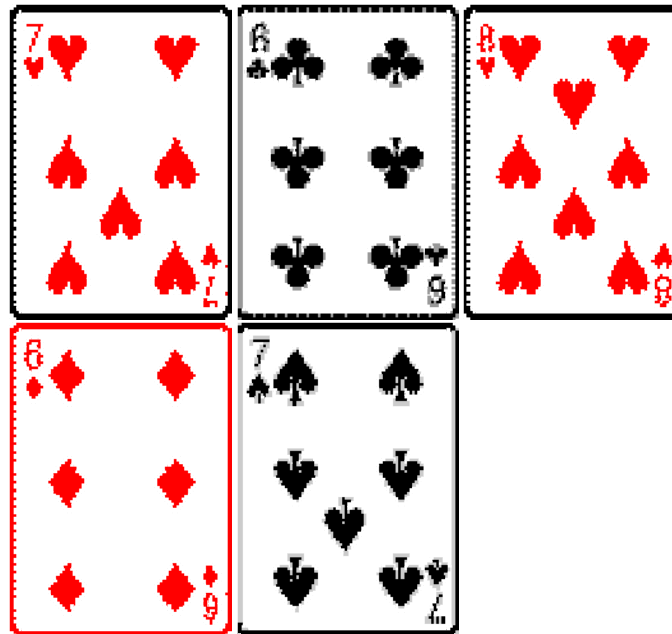


Pick a card and focus on it for 3 seconds



The next slide will have removed your chosen card

It's gone isn't it – Amazing!!



On that note...The End