



The Brain....The Body...and You

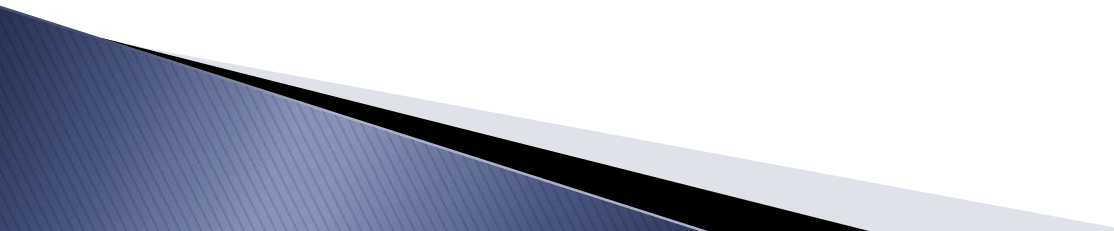
Presented by St. Lawrence College with support from MOHLTC Stroke System

This project is supported by:



STROKE STRATEGY
of Southeastern Ontario

Learning Series Topics

- ▶ Stroke Care from Prevention to Life After Stroke & Continence Care
 - ▶ Mobility: Positioning and Transferring
 - ▶ Swallowing, Feeding and Hydration
 - ▶ Communication and Behaviour
- 

From Prevention to Life After Stroke

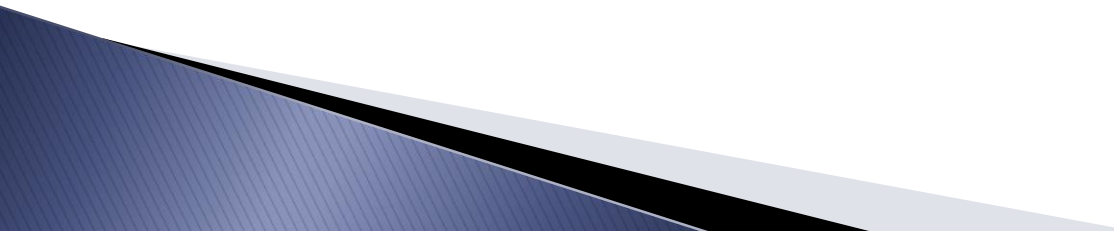
Presented by:

Delanya Podgers, NP,MN, CNN(C)

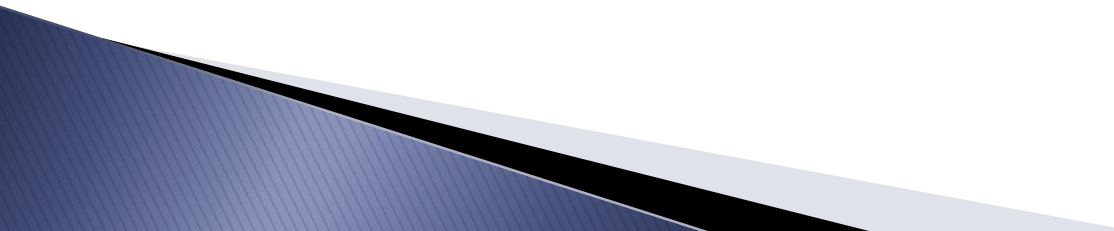
St. Lawrence College, Kingston Campus



Overview of Workshop

- ▶ What is a Stroke
 - ▶ Types of Strokes
 - ▶ The “Warning” Signs
 - ▶ Risk Factors for Strokes
 - ▶ Effects on an Individual & Family
 - ▶ Management and Care
- 

Stroke

- ▶ 4th leading cause of death in Canada
 - ▶ Leading cause of disability and LTC institutionalization
 - ▶ Second only to Alzheimer's Disease as a cause of dementia
 - ▶ More females than males die
 - ▶ Risk of stroke doubles every 10 yrs after 55
 - ▶ Cost to Canadian economy \$2.7 billion a year
- 

- ▶ Today we can...
 - Treat stroke
 - Decrease risk
 - Improve outcomes for survivors
 - Avoid disability

- ▶ 60 % of Stroke Survivors are left with a moderate to severe disability

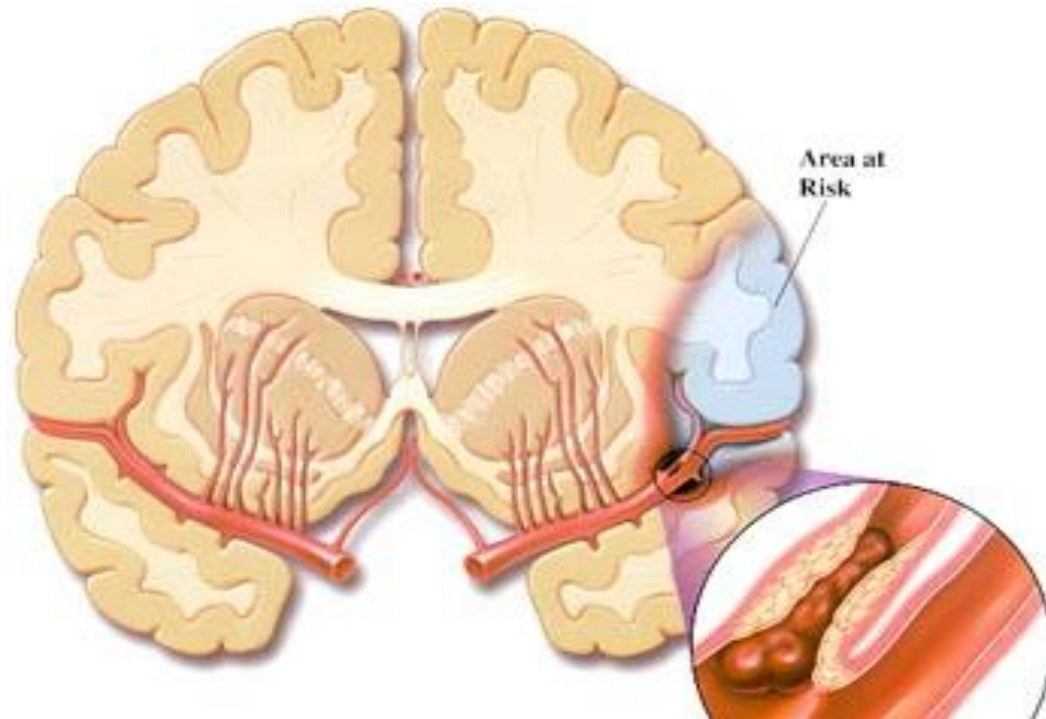
Stroke

What is a stroke?

- ▶ It is an interruption in the blood supply to the brain causing injury to that part of the brain

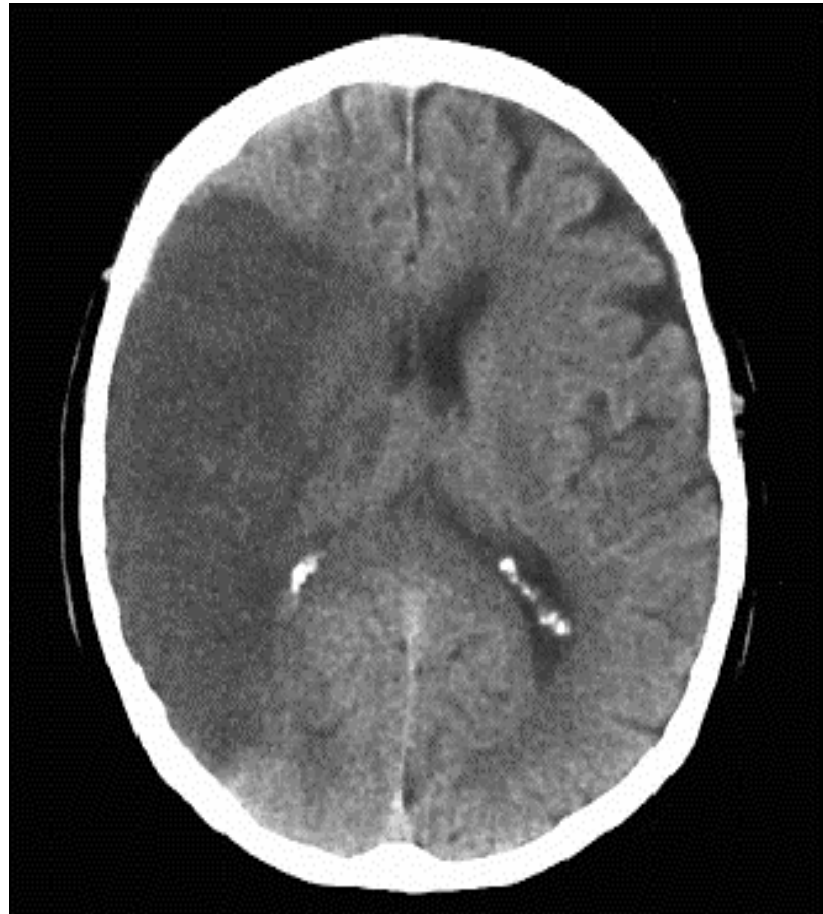
Ischemic Stroke

Sudden injury to a part of the brain caused by an occluded blood vessel



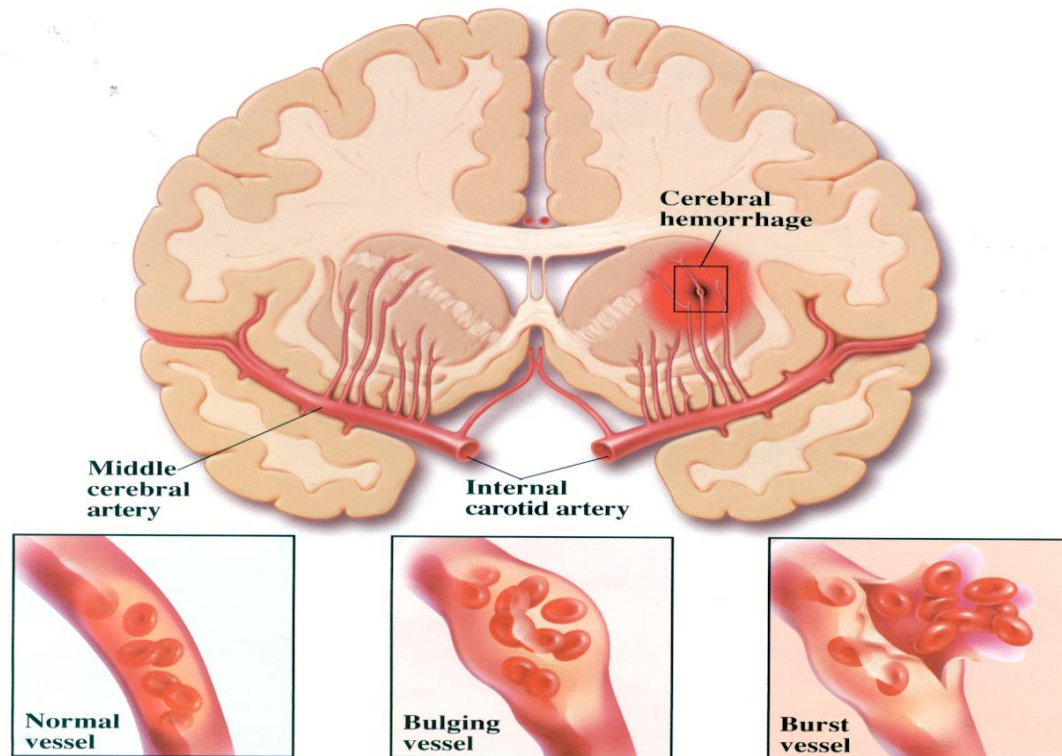
Ischemic Stroke

- ▶ Large Infarct



Hemorrhagic Stroke

Sudden injury to a part of the brain caused by the rupture of a blood vessel

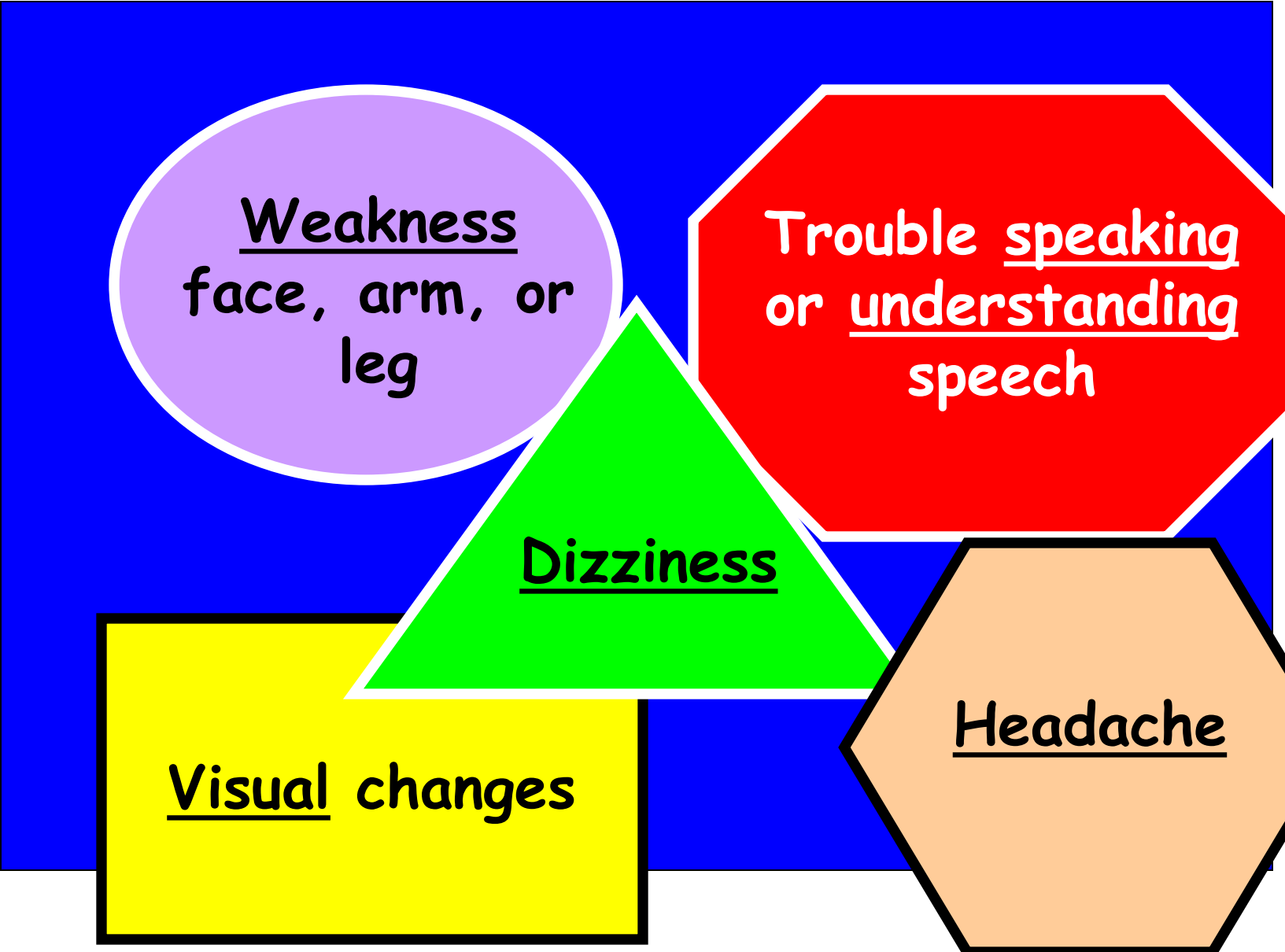




Hemorrhagic Stroke

Signs and Symptoms of Stroke





Weakness
face, arm, or
leg

Trouble speaking
or understanding
speech

Dizziness

Visual changes

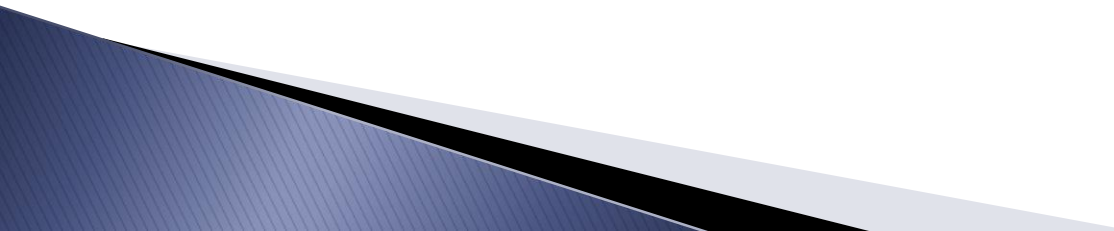
Headache

- Recognize and react video clip

Transient Ischemia Attacks

- Also termed TIA's, Mini Strokes
- Is temporary interruption in the blood supply to a specific region of the brain
- Deficits must resolve within 24hr, however 50% experience symptom resolution in less than 30minutes
- Can be an important warning sign that a person may have a stroke in the future

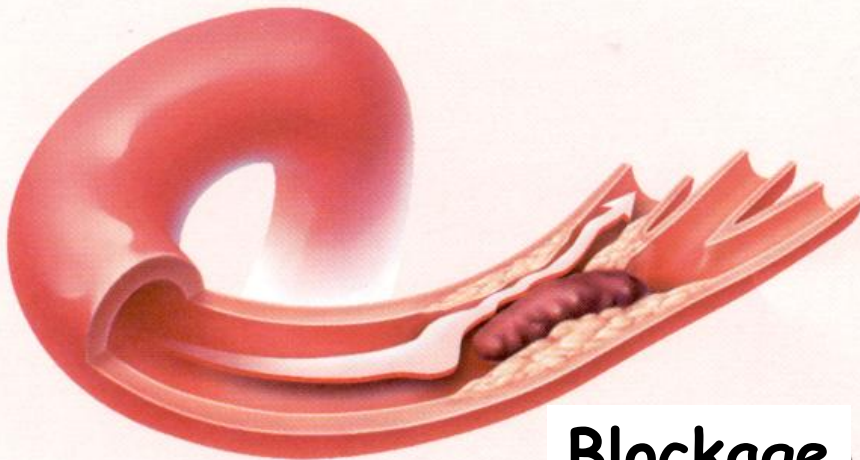
TIA's should never be ignored



Mechanism of a TIA



Normal

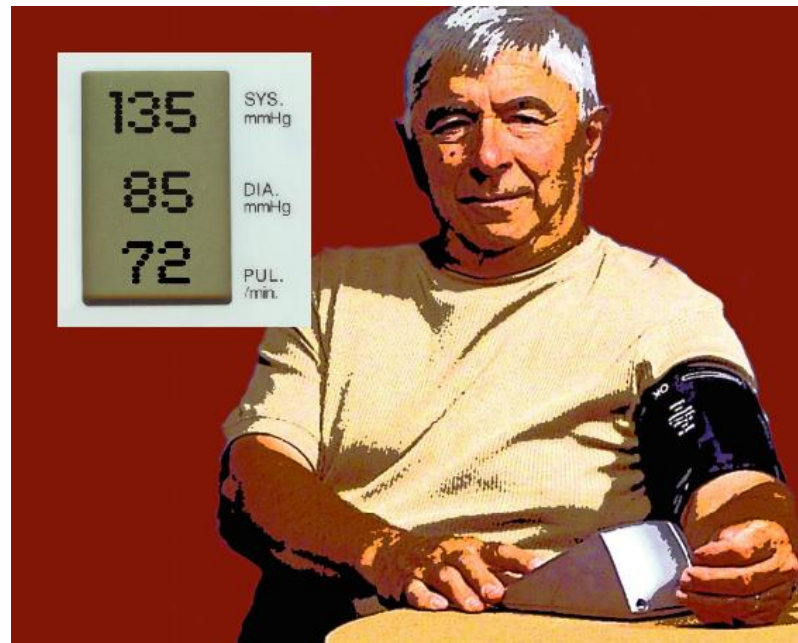


Blockage

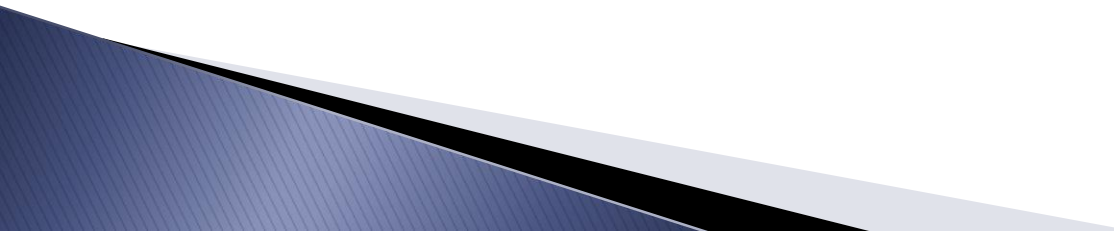


Clot dissolves

Risk Factors for Stroke



Non- Modifiable Risk Factors

- ▶ Age
 - ▶ Gender
 - ▶ Family history
 - ▶ Ethnicity
- 

Modifiable Stroke Risk Factors

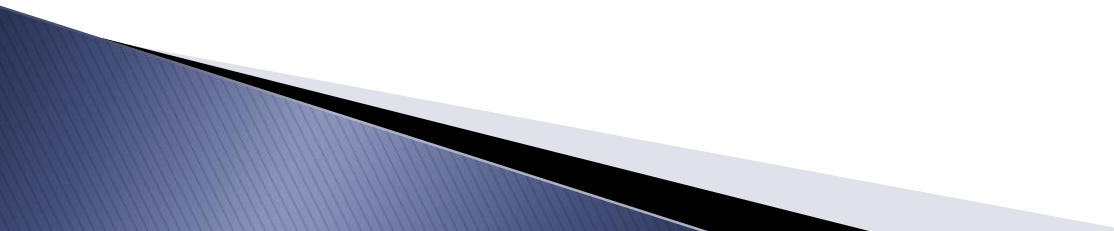
Lifestyle

- ▶ High fat, high salt diet
- ▶ Smoking
- ▶ Obesity
- ▶ Sedentary life
- ▶ Excess alcohol

Disease

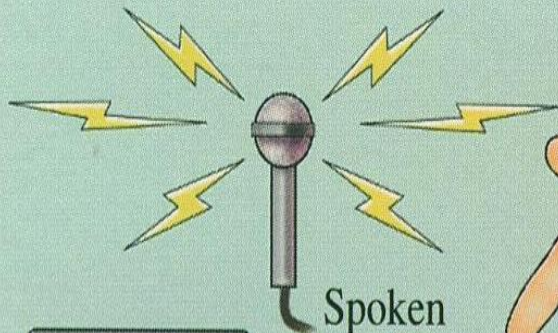
- ▶ High blood pressure
- ▶ Diabetes
- ▶ High cholesterol
- ▶ Heart disease
- ▶ TIA or previous stroke
- ▶ Coagulation disorders
- ▶ PVD

Risk of Re-Stroke

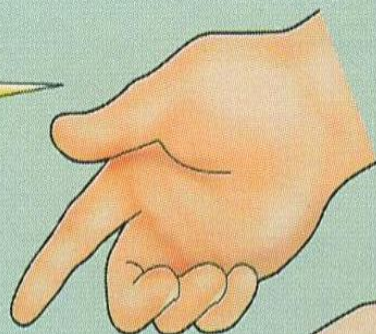
- ▶ Approximately one-third of survivors experience a recurrent stroke within 2 years
 - ▶ 3% have a second stroke within 30 days of the first event
 - ▶ Managing risk is the key to preventing re-stroke
- 

A Little Anatomy.....

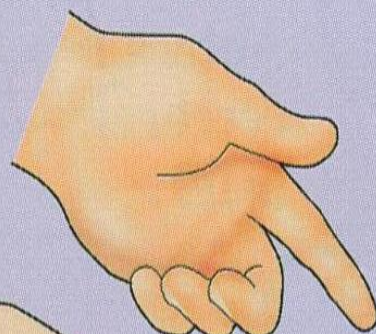




Spoken language



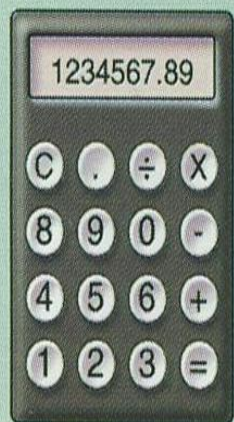
Right hand



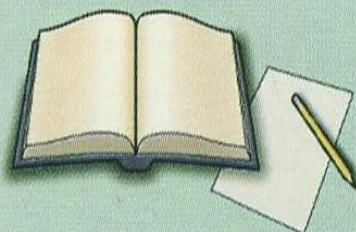
Left hand



Music



Number skills

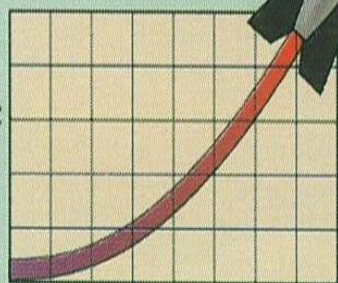


Written language

Reasoning



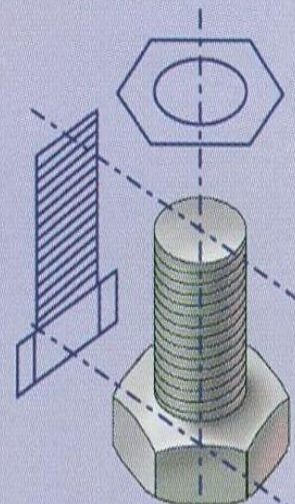
Scientific functions



Artistic functions



Art awareness



Spatial orientation



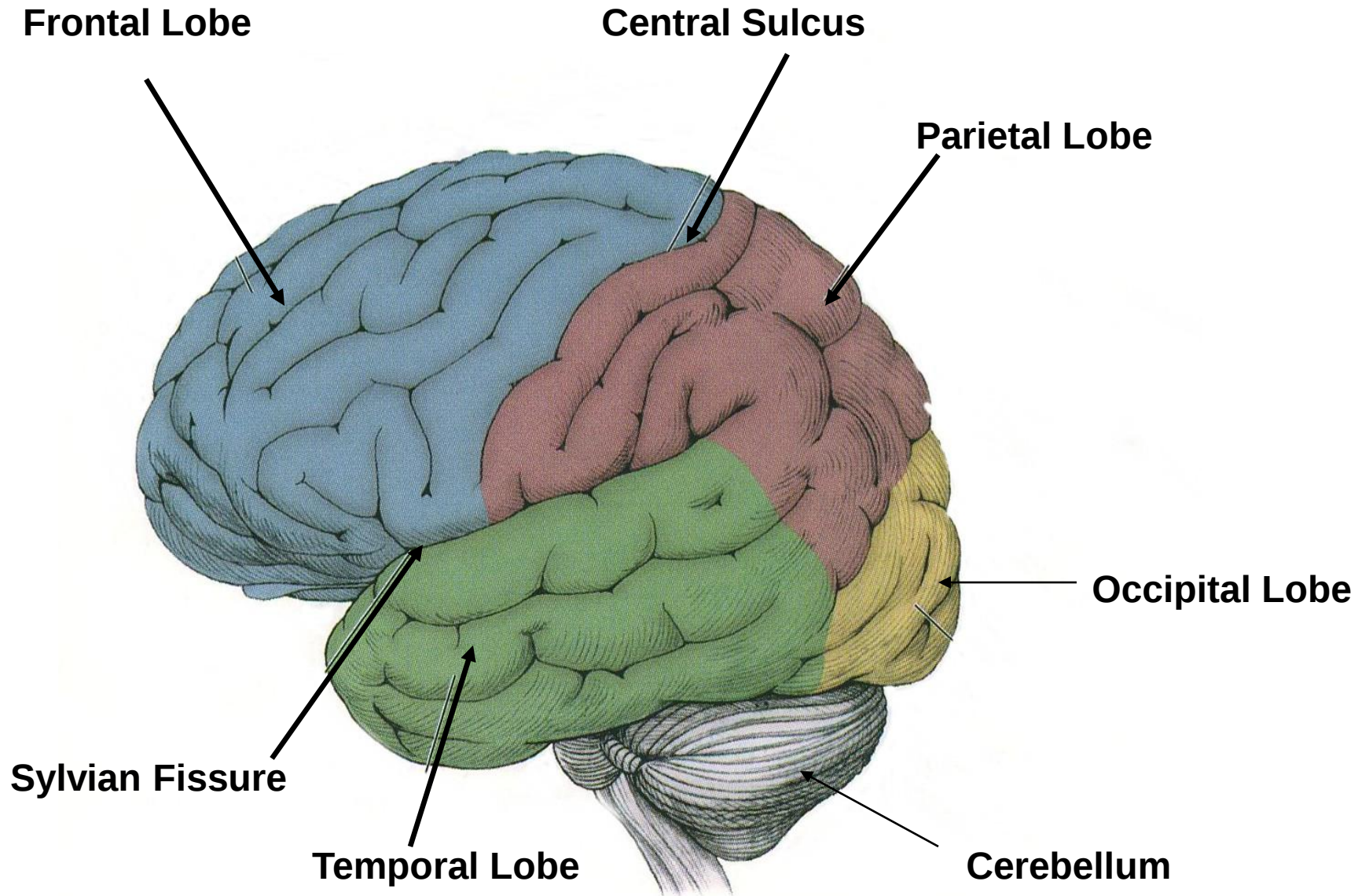
Creativity



Insight

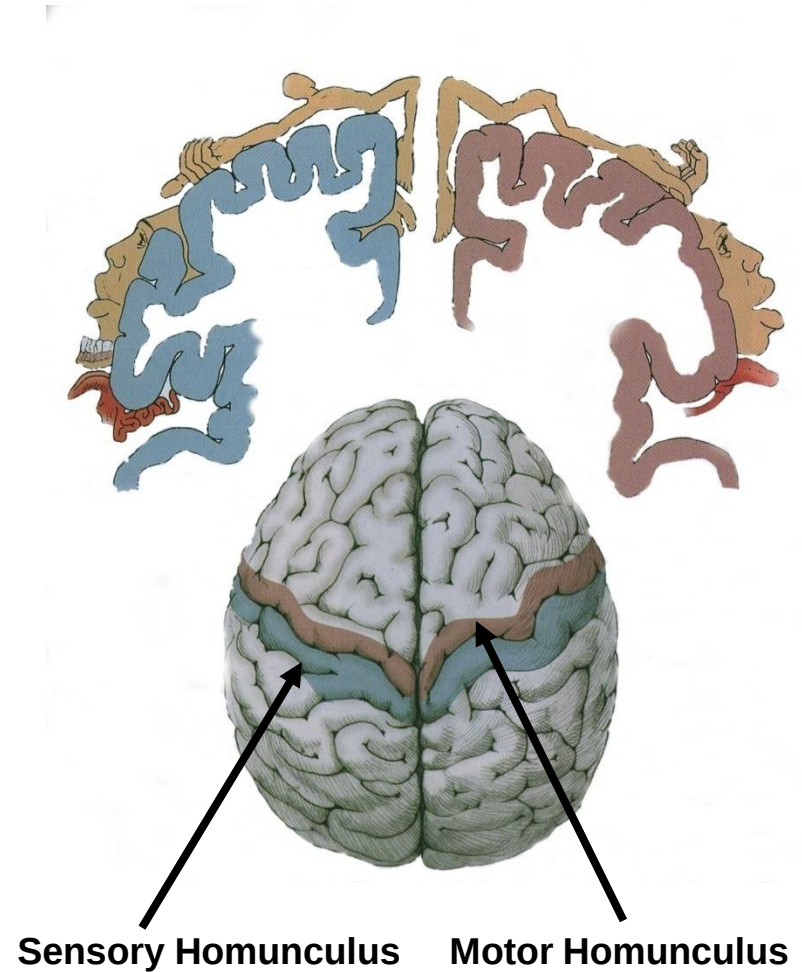
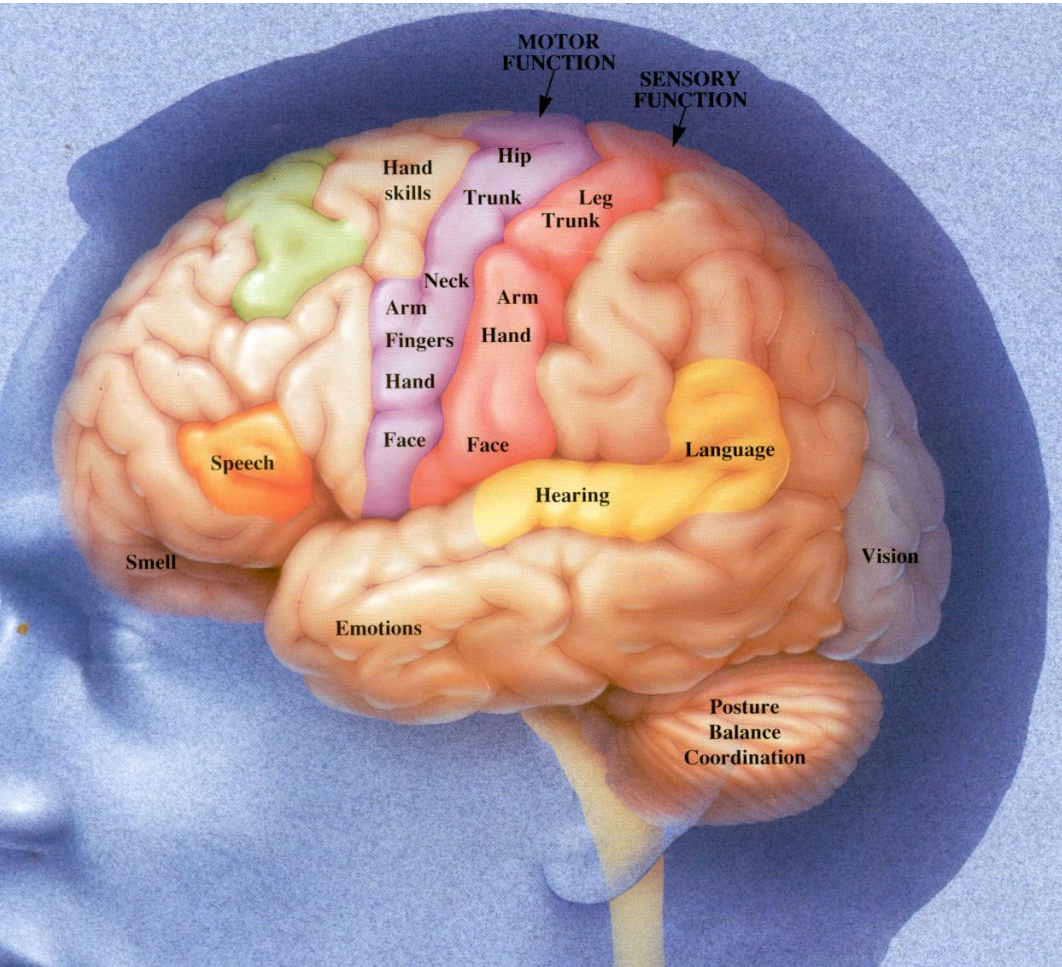
- ▶ Left hemisphere stroke video clip

- ▶ Right hemisphere video clip

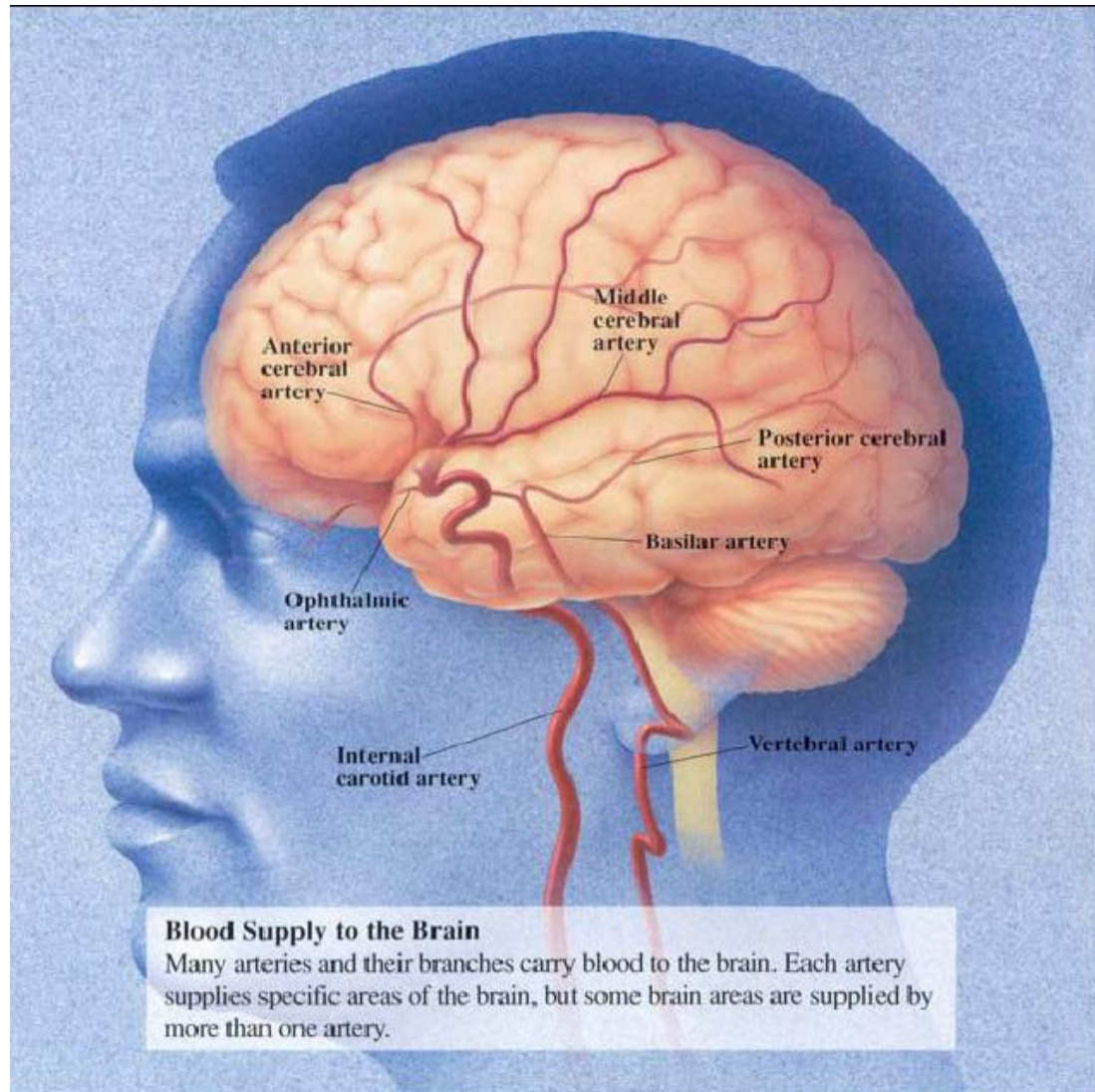


Gross Anatomy

Motor and Sensory Cortex

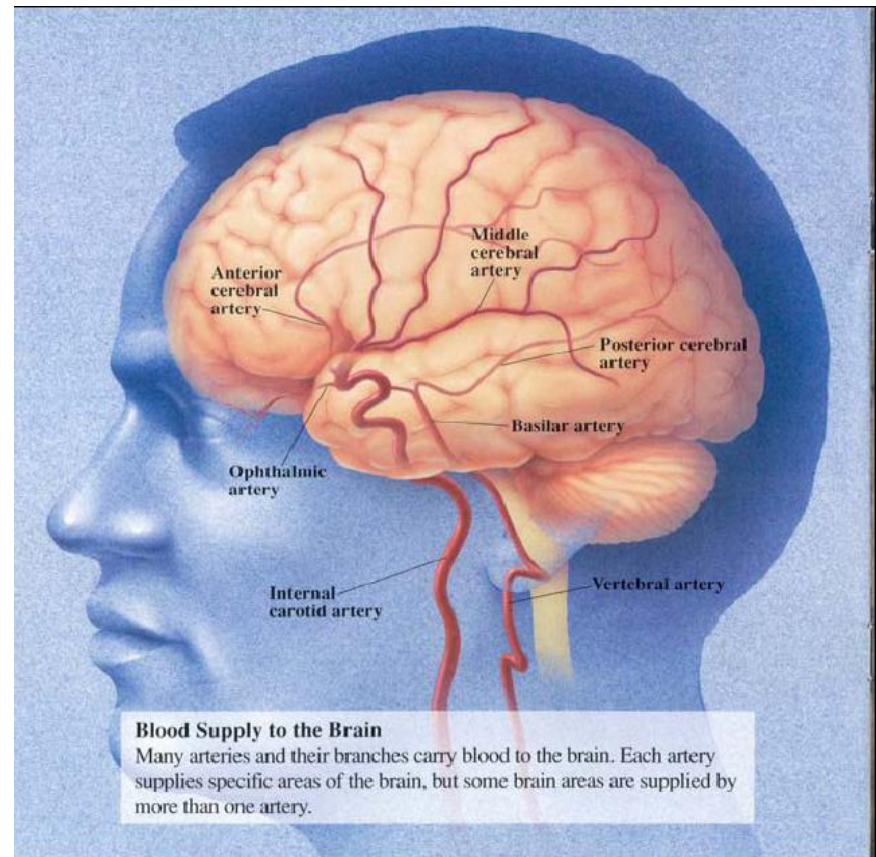


Cerebral Circulation

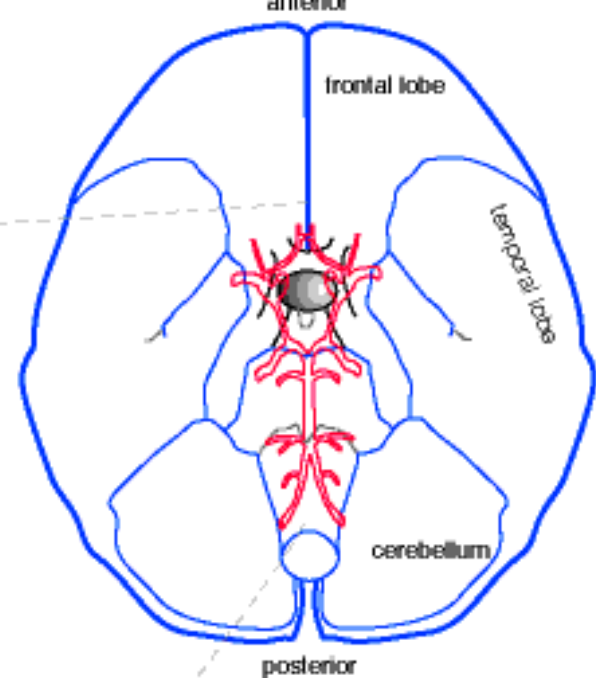
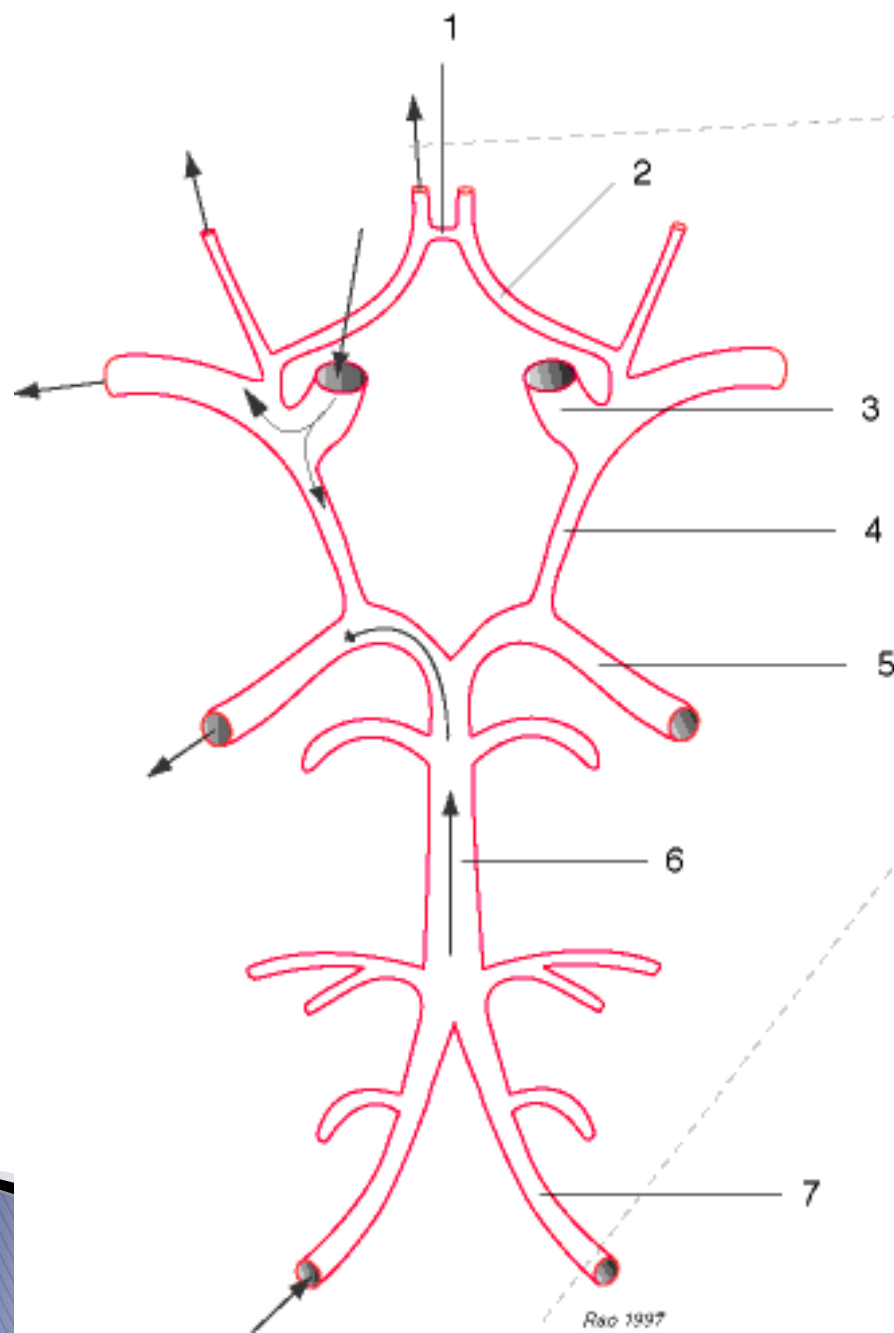


Cerebral Circulation

- ▶ Brain derives its arterial supply from carotid and vertebral arteries
- ▶ Carotid and vertebral arteries begin extracranially
- ▶ Internal carotid arteries and branches supply anterior 2/3 of cerebral hemisphere
- ▶ Vertebral and basilar arteries supply posterior and medial regions of hemispheres, brainstem, diencephalon, cerebellum and cervical spinal cord



The Arterial Circle of Willis



Inferior view of the brain

Arteries of the Circle of Willis*

1. Anterior communicating*
2. Anterior cerebral*
3. Carotid
4. Posterior communicating*
5. Posterior cerebral*
6. Basilar
7. Vertebral

Stroke Management

Stroke Treatment

▶ **Medical**

- t-PA for ischemic stroke
- Primary and secondary prevention medications

▶ **Interventional**

- Coiling & Clipping– for aneurysm repair
- Carotid Stent – for carotid stenosis

▶ **Surgical**

- Endarterectomy – for carotid stenosis
- Hematoma removal – for intracerebral hemorrhage

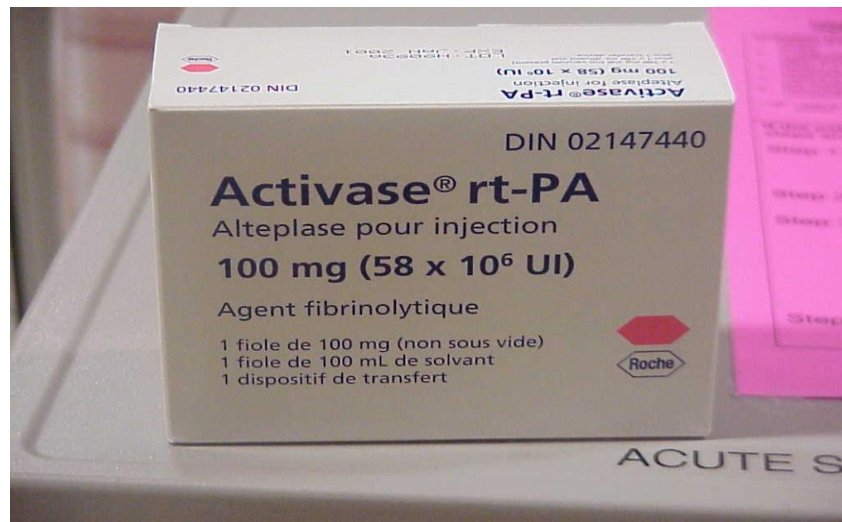
When an Ischemic Stroke Occurs:

- ▶ In ischemic Stroke there is obstruction of blood vessel and this initiates the “ischemic cascade”
 - ▶ Cells can not survive without oxygen, and irreversible brain damage occurs at 4–6 minutes without oxygen
 - ▶ Neurons become ischemic (oxygen starved) and will progress to infarcted (non-viable) if not re-oxygenated
- 

- ▶ Cells in the core will die
- ▶ Penumbra, or surrounding area, is potentially viable and this region can potentially be salvaged
- ▶ Treatment for ischemic stroke includes the use of tPA (Tissue Plasminogen Activator) the *“Clot Busting drug”*

Clinical Management of Ischemic Stroke

- ▶ Thrombolytic Therapy
 - t PA must be initiated within 4.5* hours of the onset of a stroke or from the time the person was “last seen normal” a stroke

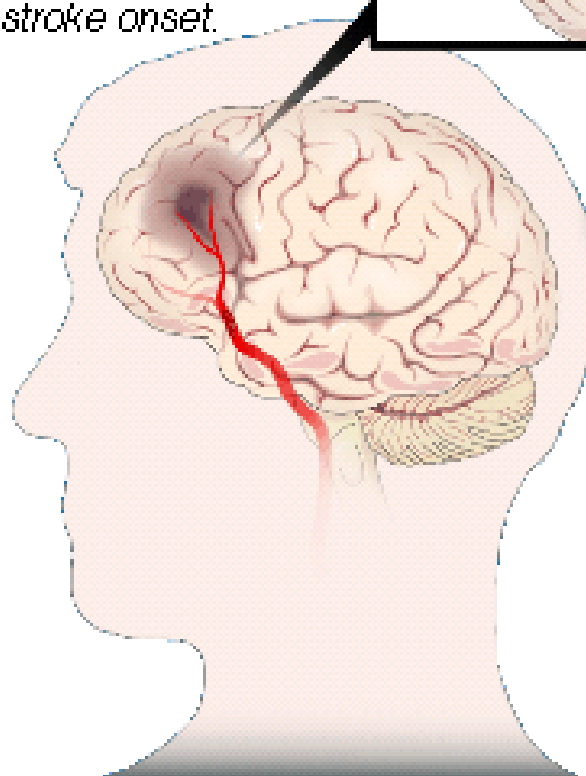
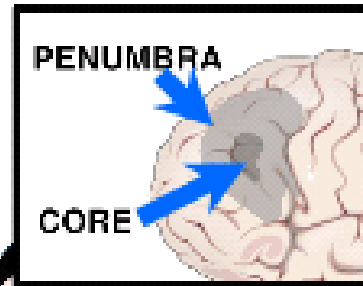


tPA for Ischemic Stroke

- ▶ tPA binds to fibrin (clot) and converts plasminogen to plasmin stimulating fibrinolysis, allowing the clot to break down and restore blood flow
- ▶ Not all patients are eligible; numerous inclusions and exclusions

Goal of Emergency Stroke Care: Save the Penumbra

Penumbra is zone of reversible ischemia around core of irreversible infarction—salvageable in first few hours after ischemic stroke onset.



From *Advanced Stroke Life Support*

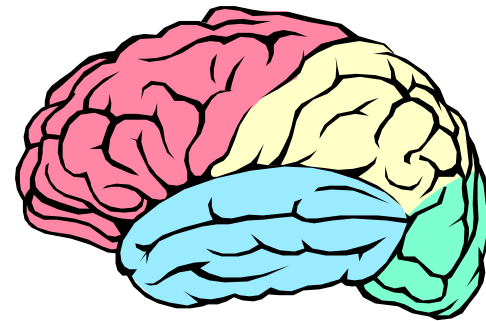
© 2004, University of Miami

Immediate Management

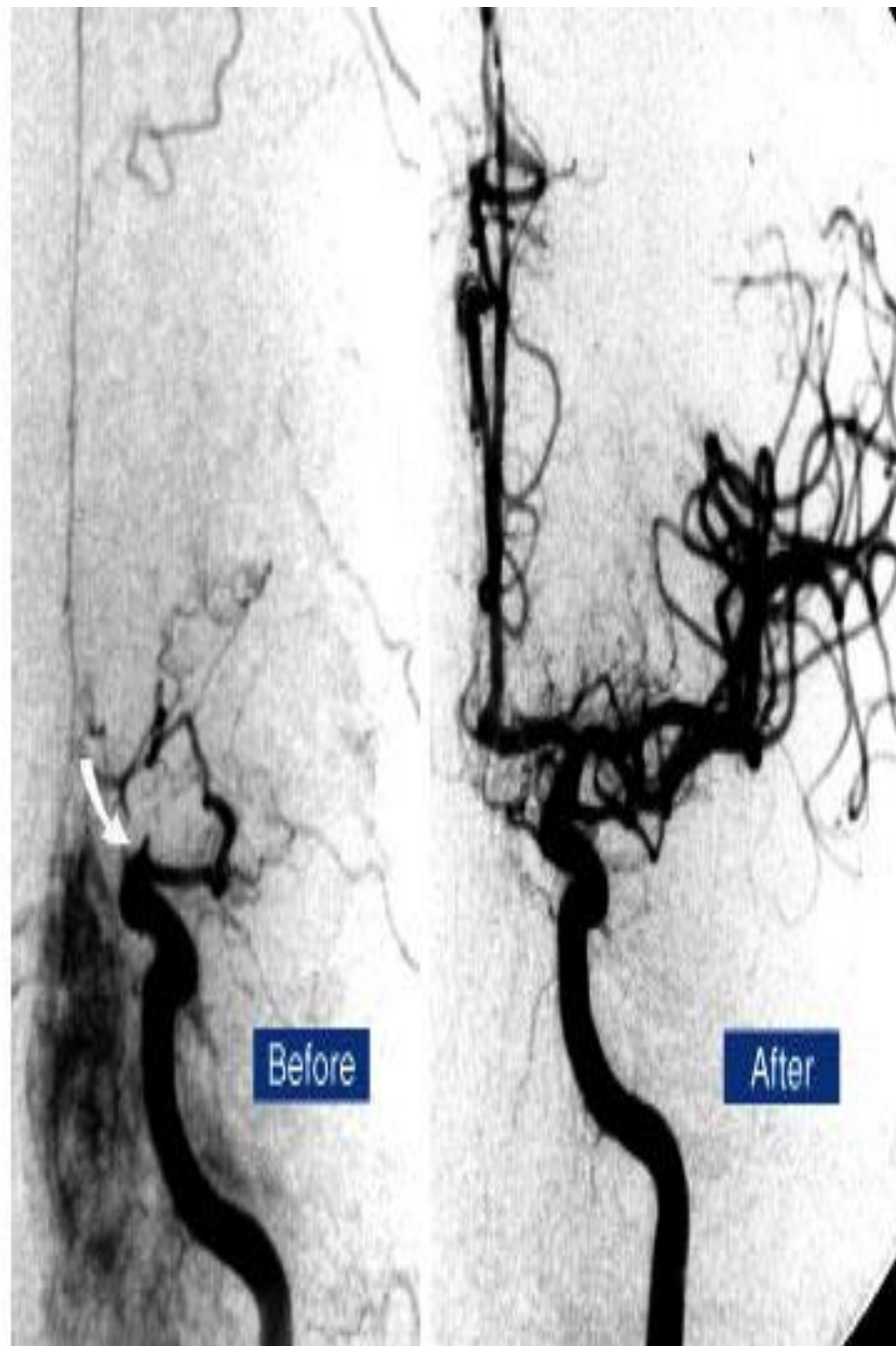
Thrombolytic therapy



is



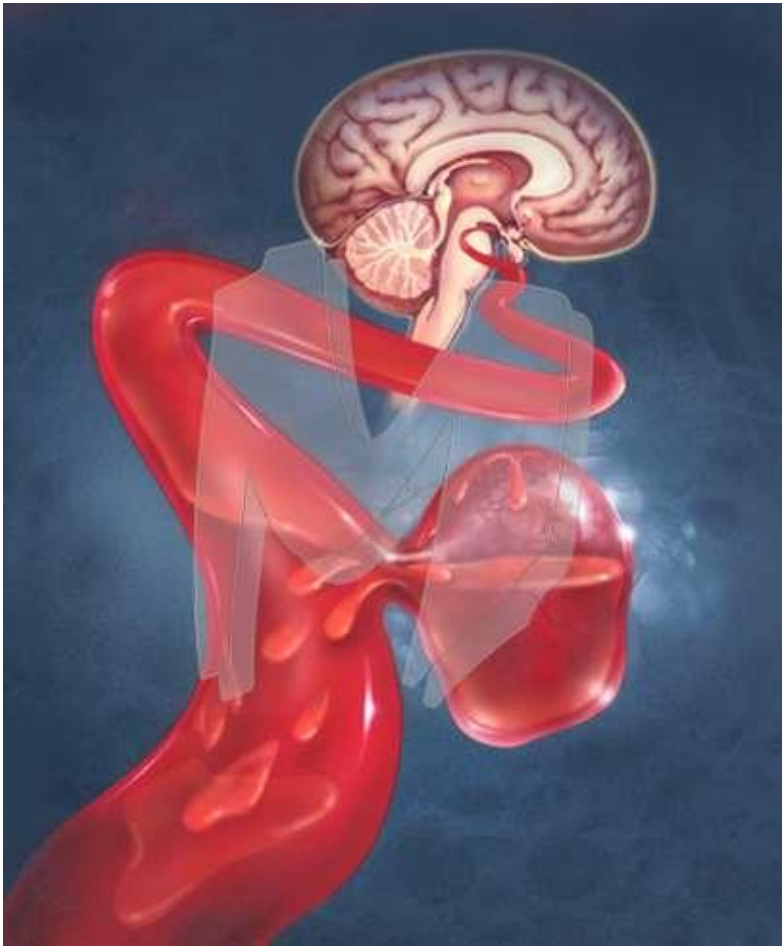
**Call 911 at the first stroke
symptom**



When a Hemorrhagic Stroke Occurs

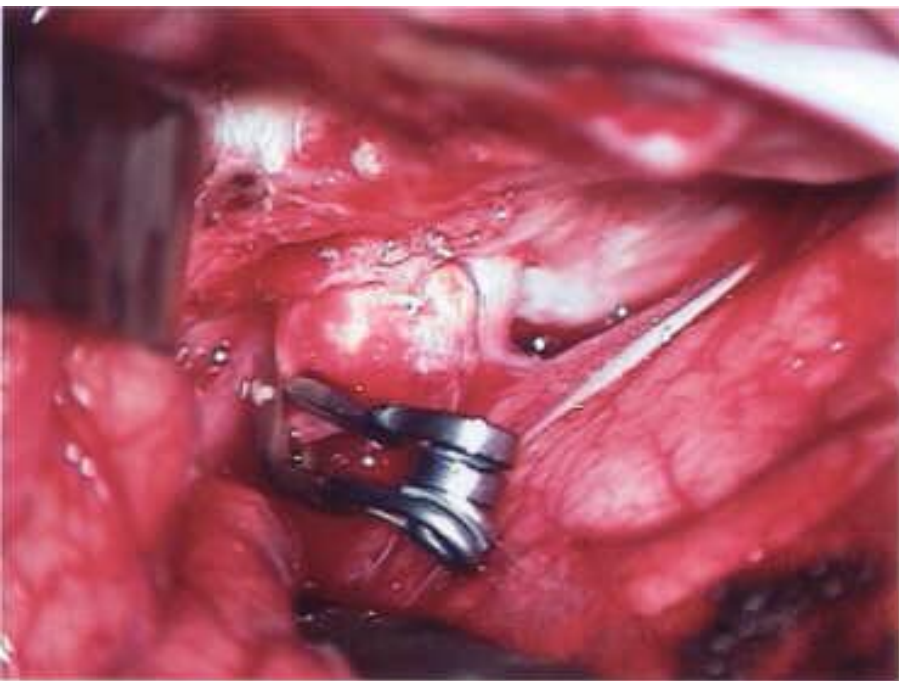
- ▶ Bleeding into the brain tissue results in:
 - Increased pressure within the skull (increased intracranial pressure)
 - Decreased blood supply to cerebral tissues

Causes of Hemorrhagic Stroke

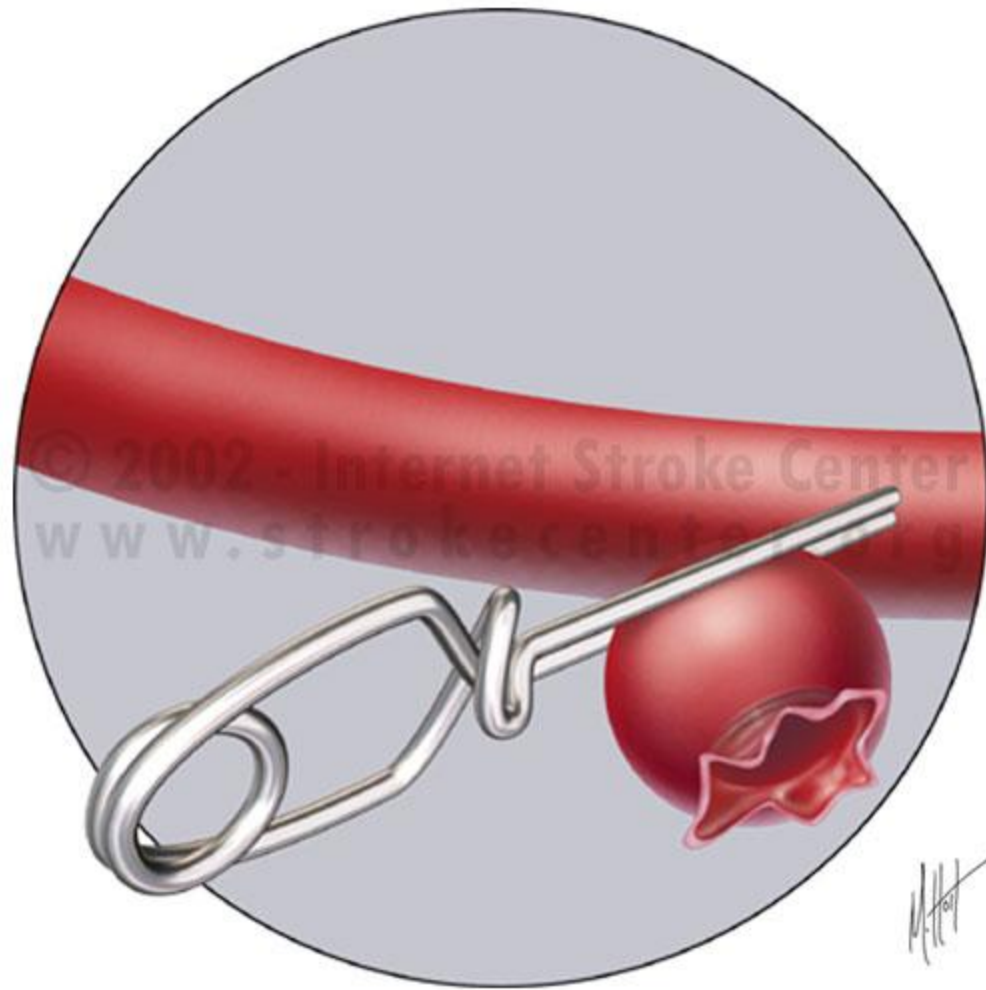


- Aneurysm
- Arteriovenous malformation
- Hypertension
- Arterial Dissection
- Subarachnoid hemorrhage
- Hemorrhagic transformation of an ischemic stroke

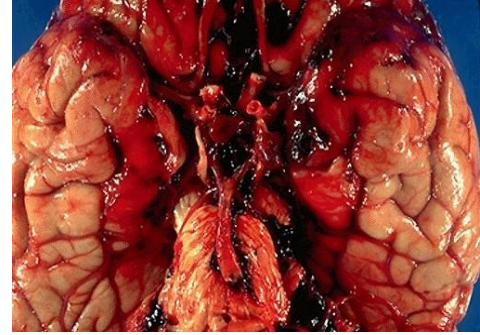
Clinical Management of Hemorrhagic Stroke



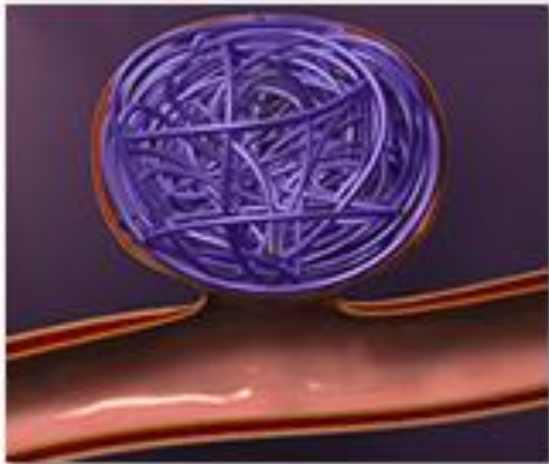
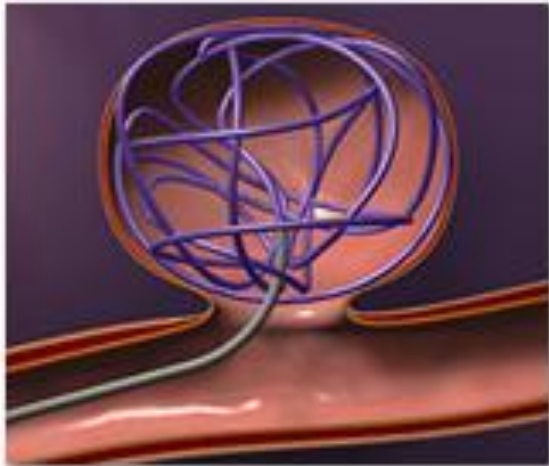
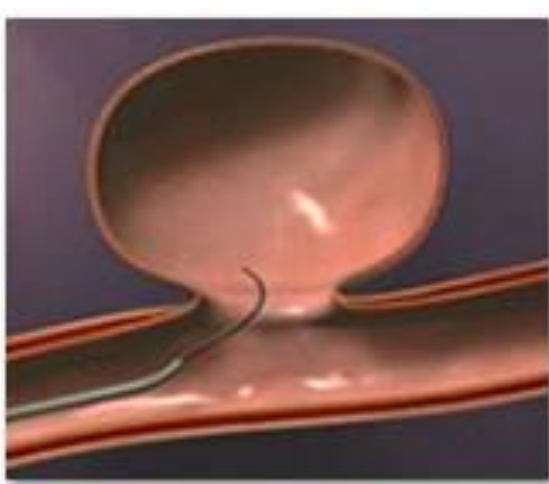
Surgical intervention:
Clipping



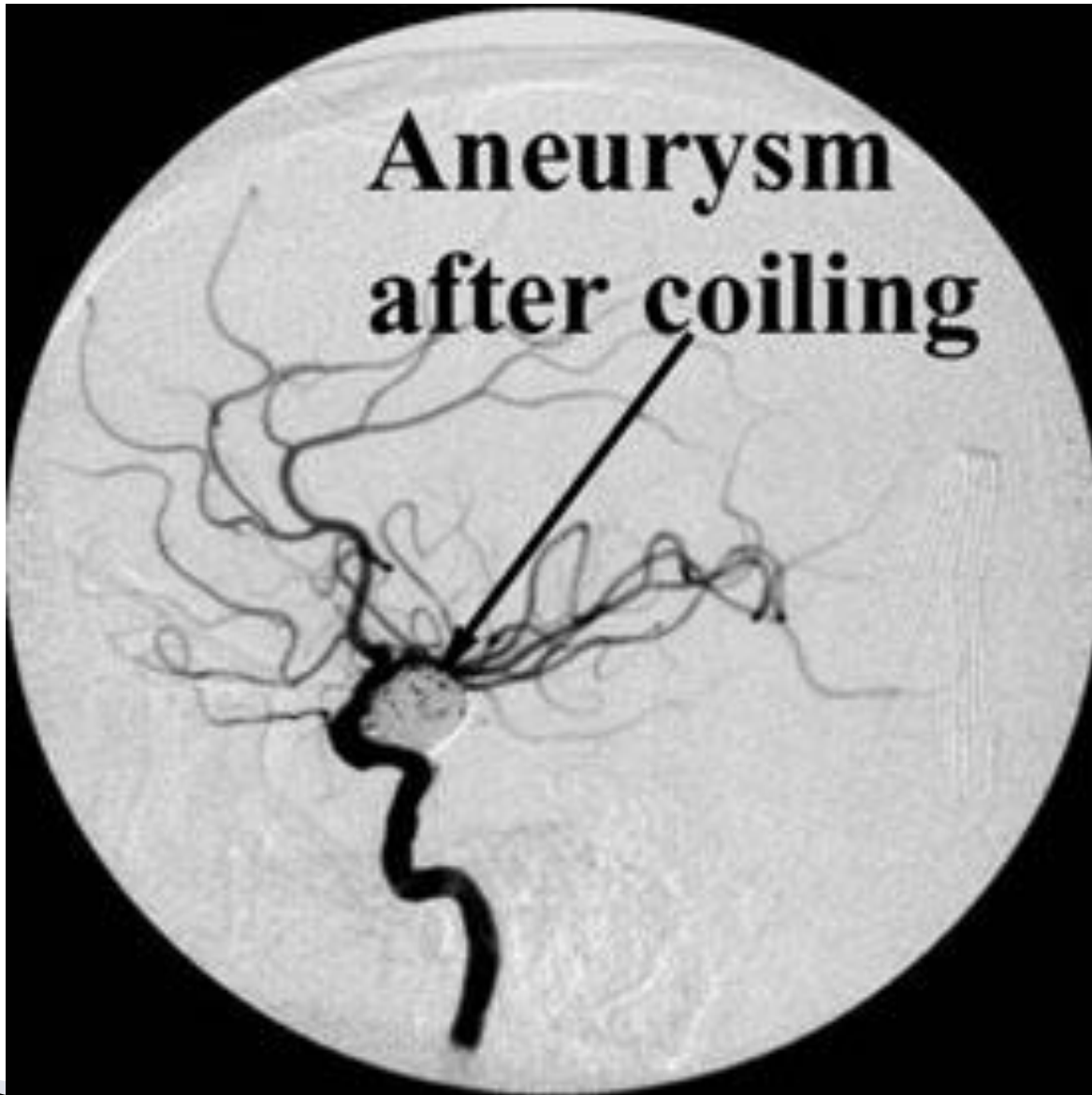
Coiling



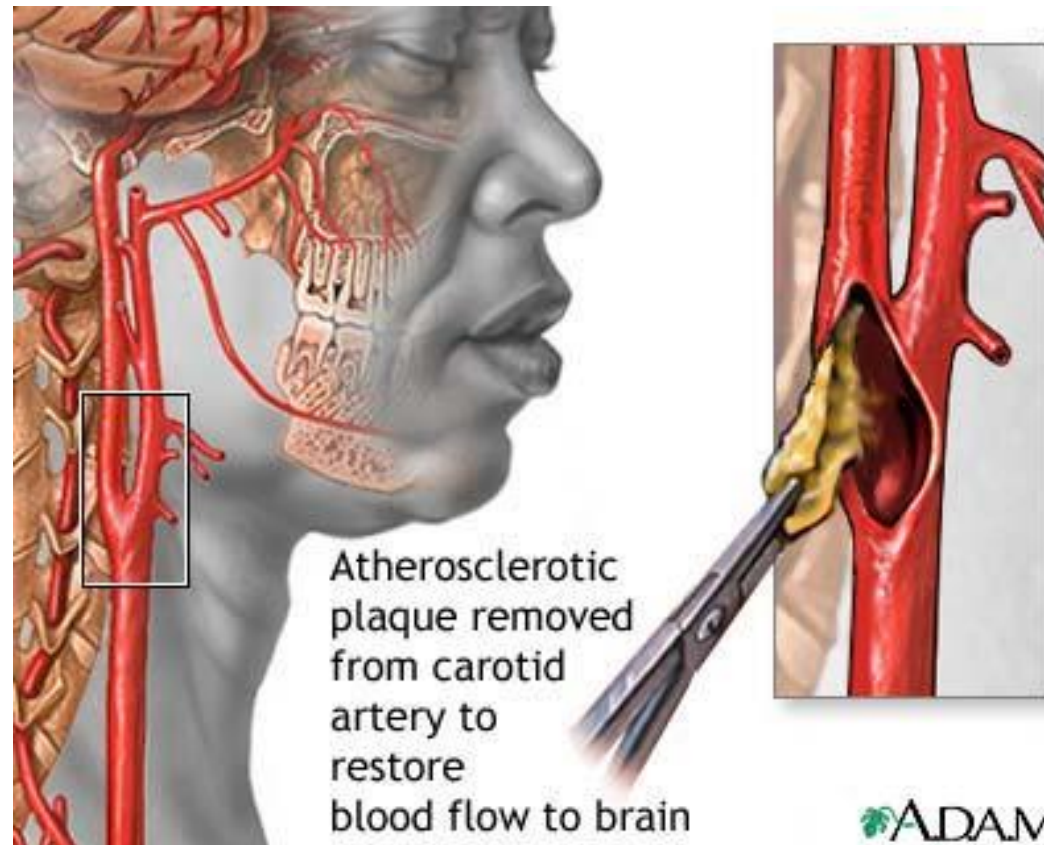
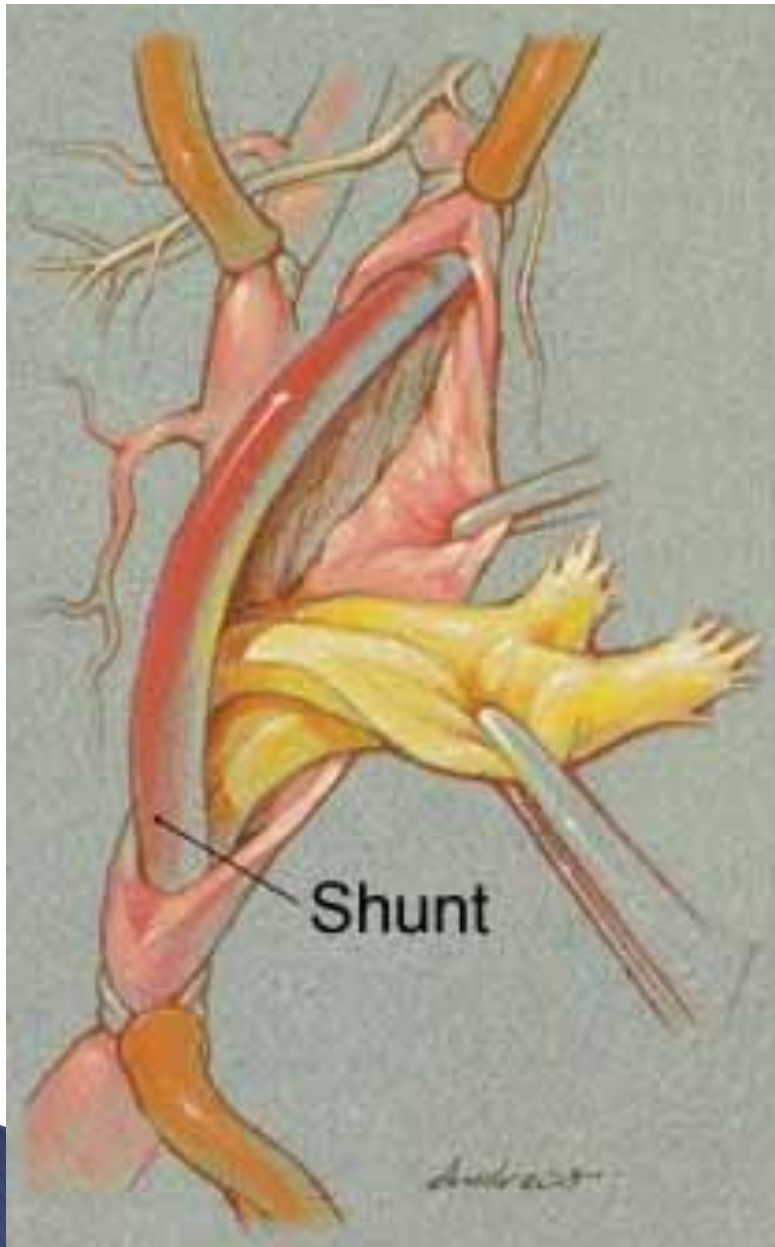
- Neurointerventional procedure
- Suitable for those with high grade or high risk aneurysms, elderly, posterior circulation aneurysm, patients with comorbid conditions



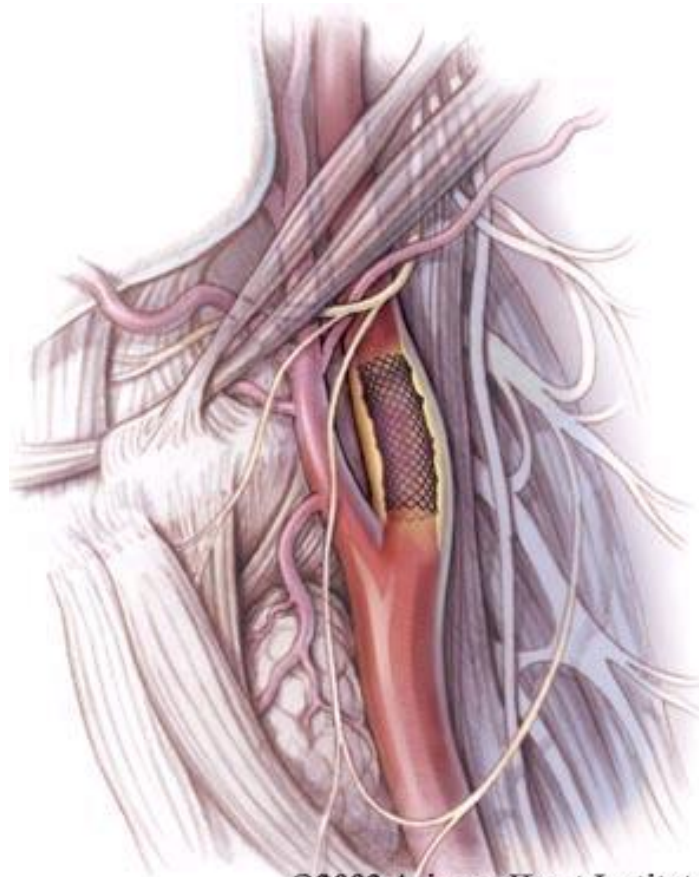
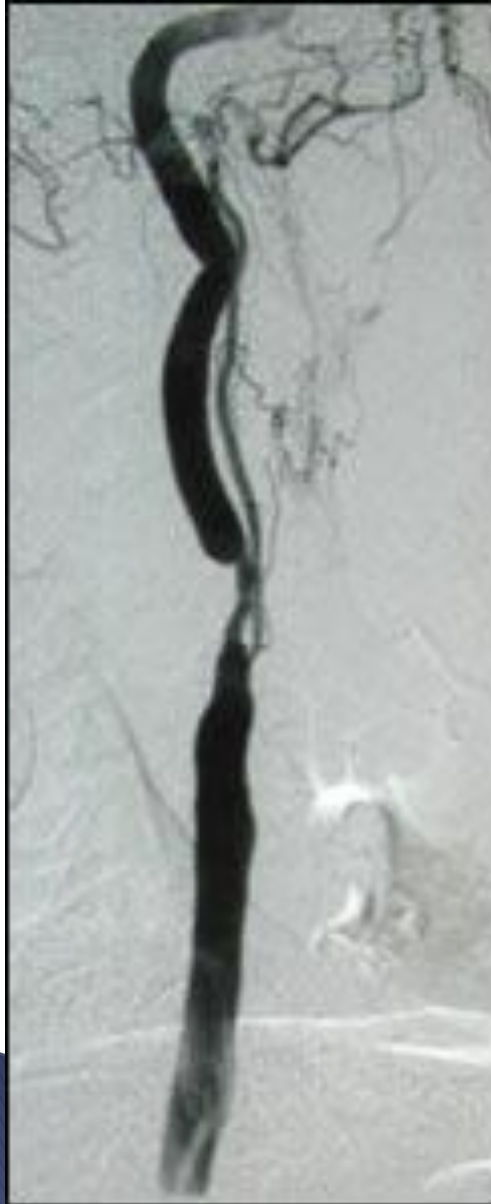
**Aneurysm
after coiling**



Endarterectomy



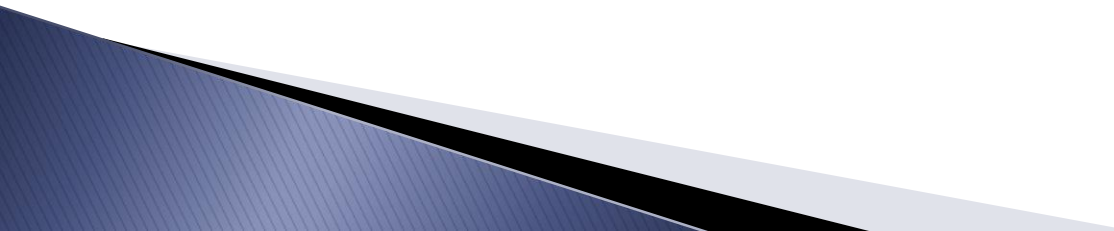
Carotid Stent



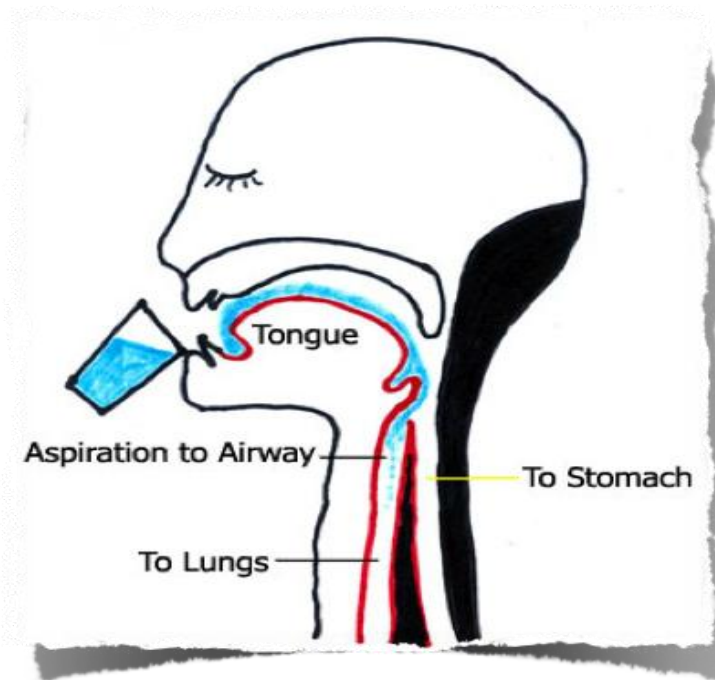
©2002 Arizona Heart Institute



Primary & Secondary Prevention Medications

- ▶ Medications are determined in part by the patient's individual risk factors
 - ▶ Can include
 - Antihypertensives
 - Lipid lowering agents
 - Platelet inhibitors or anticoagulants
 - Hypoglycemic medications
- 

Common Stroke Deficits & Complications



▶ Motor deficits

- Can range from include weakness to paralysis of the face, arm, leg, torso

▶ Sensory deficits

- Can range from numbness to loss of sensation of the face, arm, leg, torso

▶ Visual deficits

- Visual field deficits are common

▶ Cognitive deficits

- Can be obvious or more subtle
- Can affect intellect, safety, the ability to learn

▶ Aphasia

- Expressive – inability to speak or *express* oneself
- Receptive – inability to understand or *receive* the what is being said

▶ Dysphagia

- 50% of stroke survivors have difficulty with swallowing
- 20% will die within the first year related to aspiration pneumonia

▶ Nutritional issues

- Can be pre-existing and compounded by motor deficits, dysphagia, cognitive impairment, visual deficits, mood

▶ Joint injury

- Particularly the hemiparetic shoulder

- ▶ Spasticity and contracture
 - Affects about a third of survivors
- ▶ Inattention or neglect
 - Decreased awareness or responsiveness to stimuli on the affected side
- ▶ Depression
 - Affects the majority of stroke survivors
 - Can impact functional recovery
- ▶ Apraxia
 - Disorder of learned motor movements not attributable to motor or sensory dysfunction



▶ Emotional liability

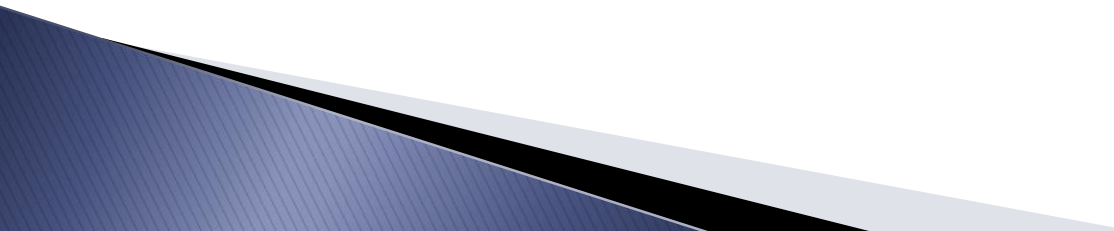
- Extremes of emotion that may or may not be related to how the survivor feels

▶ Skin breakdown

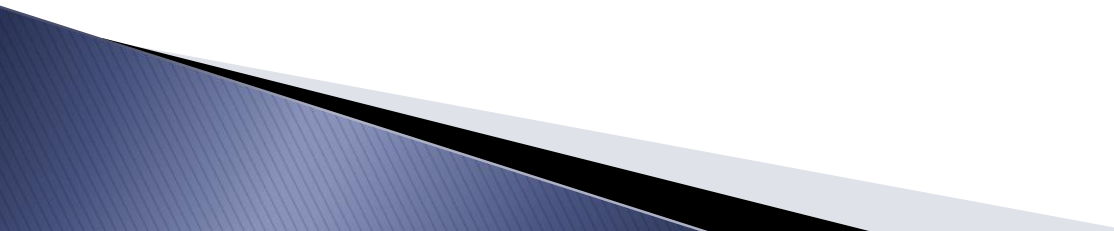
- Risk is increased as a result of motor and sensory deficits, incontinence, nutrition
- Co-morbidities such as diabetes also play a role

▶ Falls

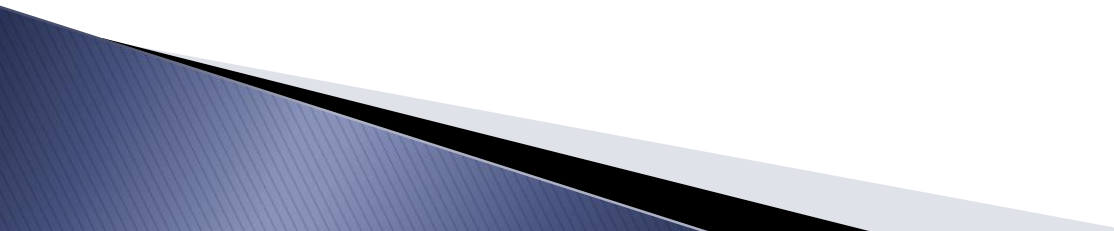
- Survivors are at high risk of falls due to their deficits

- ▶ Urinary tract infections
 - Affects approximately 40% of survivors
 - ▶ Aspiration pneumonia
 - Occurs in survivor with swallowing deficits
 - Leading cause of death
 - ▶ DVT
 - High risk of DVT in affected limbs
- 

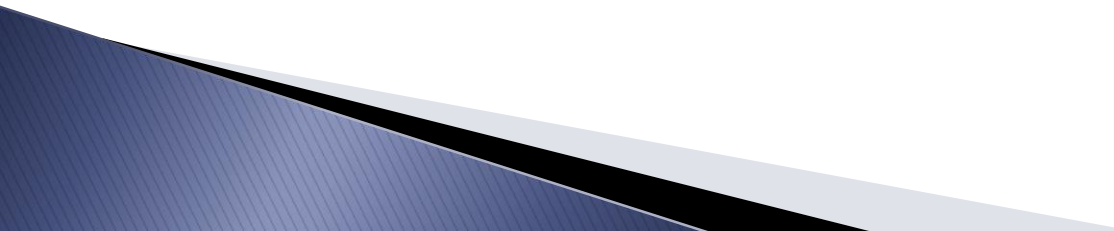
Interprofessional Support Care

- ▶ Cardiovascular System: Maintain balance of cardiac status – HR, BP
 - ▶ Neurologic System: Prevent further damage
 - ▶ Musculoskeletal System: Maintain optimal functional positioning
- 

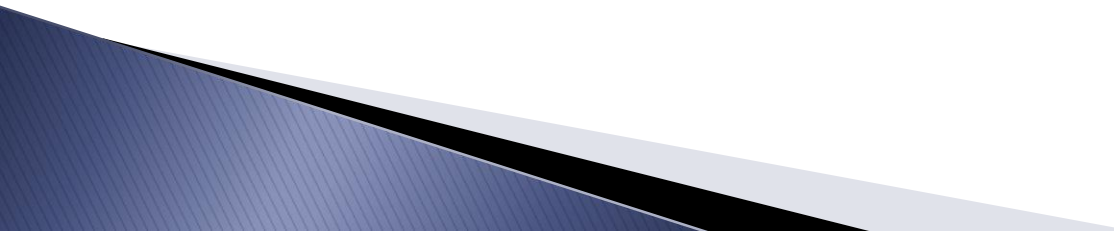
Interprofessional Support Care

- ▶ Integumentary System: Maintain skin integrity
 - ▶ Urinary System: Maintain fluid output, urinary incontinence, urinary retention
 - ▶ Gastrointestinal System: Monitor nutritional intake
- 

Individual and Family Effects

- ▶ Grief
 - ▶ Frustration
 - ▶ Fatigue
 - ▶ Anxiety
 - ▶ Emotional Liability
- 

A Team Approach

- Client and family
 - Physicians
 - Nursing
 - Personal Support Workers
 - Physiotherapy
 - Occupational therapy
 - Speech Language Pathology
 - Recreation staff
 - Social work
 - Dietitian
 - Pastoral care
 - Restorative Aides
 - Pre-hospital group
 - Lab
 - Radiology
- 

Case Studies

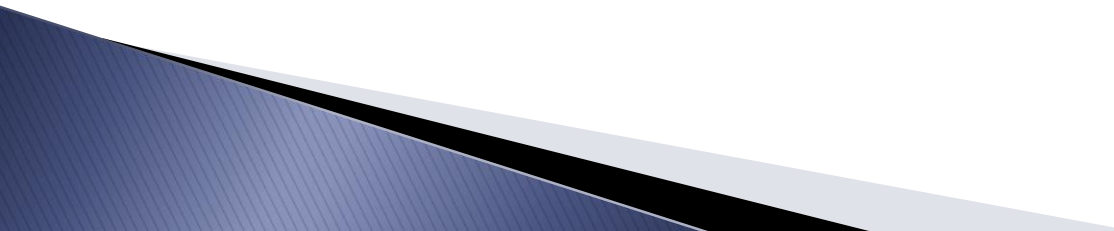


Case Study 1

Anna, a 75 year old was playing the piano one afternoon and she noticed the last 2 fingers on her right hand would not depress the keys. She thought nothing of it, closed the piano and stretched out on the couch for a nap. Her son came home from work at 8 p.m. to find his Mom still on the couch. He tried to awaken her, she opened her eyes but was unable to speak. It was determined at arrival to hospital she had had a left hemisphere stroke.

After 3 weeks in hospital, she is transferred to the Rehabilitation Unit. The 2 week followup Interdisciplinary Conference report gives you the following information:

- ▶ she is a one person moderate assist standing pivot transfer – frequent cuing is required
- ▶ she has severe right side neglect & some right side visual impairment
- ▶ she has some memory impairment for recent events
- ▶ she is continent of bowels, continent of bladder during the day but not overnight

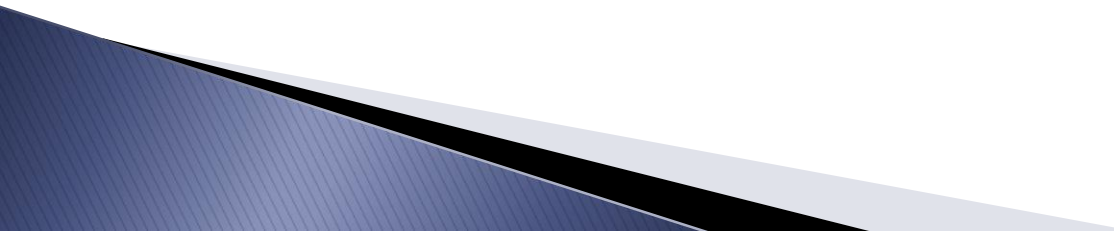
1. What issues are putting Anna at risk?
 2. What challenges are there to Anna going home?
 3. What support services / professionals would assist with your planning for Anna to return home?
- 

Case Study 2

Frank has had a stroke that has left him with aphasia and right sided hemiplegia. He does understand all conversation, using yes & no reliably. He has been on a pureed diet for his dysphagia. He uses a wheelchair for mobility & is a one person standing pivot transfer. He has experienced some urinary continence issues recently.

Frank has been a resident in your Long-Term Care home for 2 years. He is less eager to participate in his care, is taking less interest in events that are happening in the home & at times refuses to answer questions or participate in care.

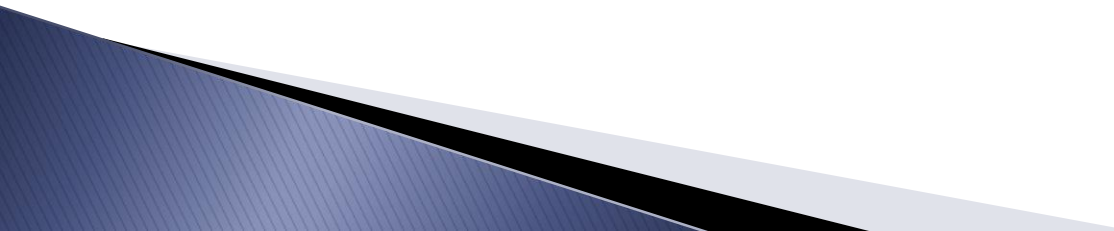


1. What issues are putting Frank at risk?
 2. What are you observing for and what interventions might you implement for Frank?
 3. What challenges are there to determining the cause of Frank's reluctance to attend events & participate in his care?
 4. What support services / professionals would assist you in this situation? Who is part of Frank's care team?
- 

Continence Care



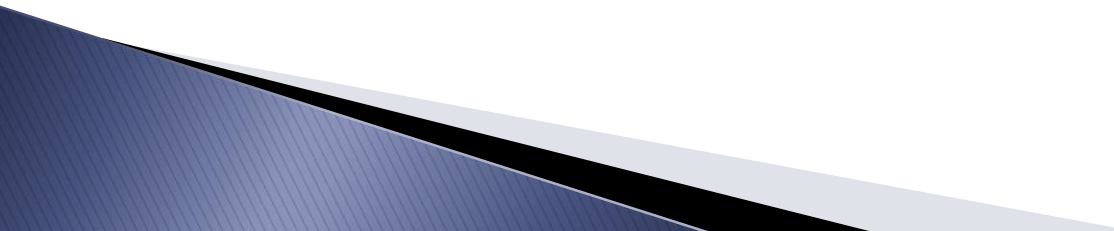
Overview & Objectives

- ▶ Recall normal bladder function
 - ▶ Identify common types of incontinence presented by the stroke survivor
 - ▶ Identify age related changes to bladder function
 - ▶ Explore interventions around bladder function
 - ▶ Discuss approaches for the stroke survivor for whom continence is an issue
- 

Continence Problems

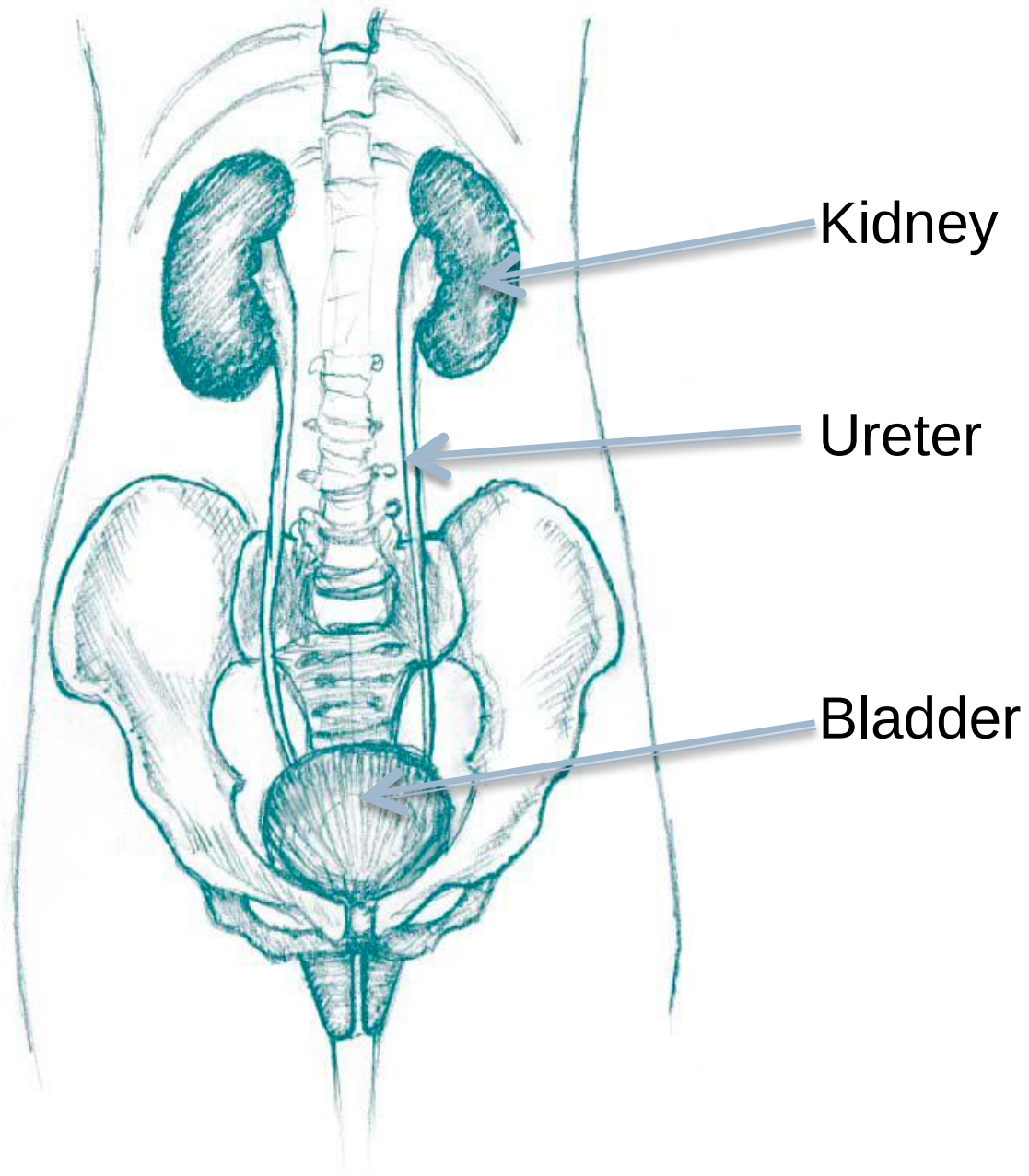
- ▶ Stroke survivors may:
 - Often experience urgency to void but have difficulty or be unable to control the urgency
 - Have diminished ability to feel bladder fullness and have bladder control
 - Experience physical complications such as infection and skin breakdown
 - Experience significant changes in their lifestyle as they attempt to cope with the urgency

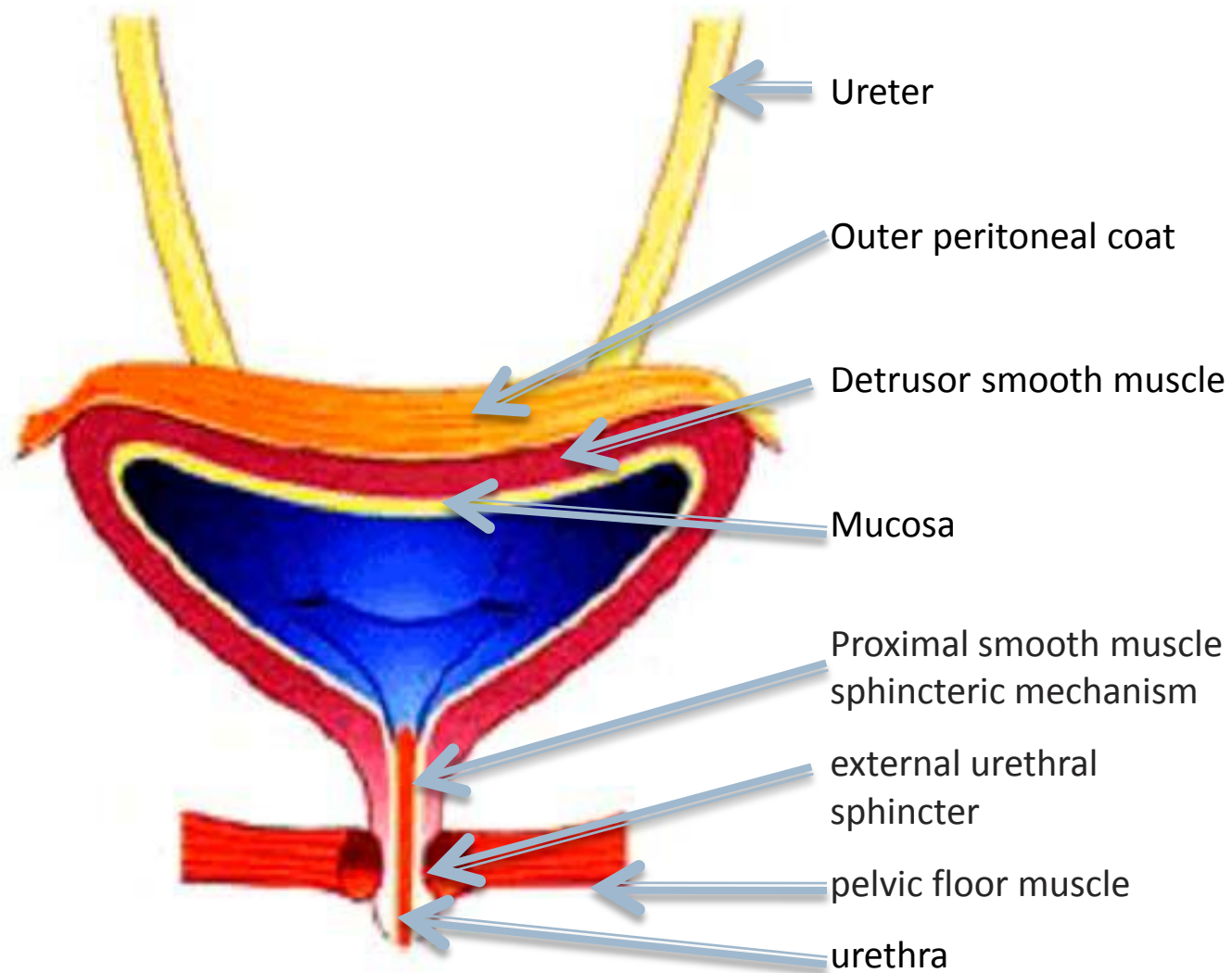
Requirements of Normal Bladder Function

- ▶ **Neurological Function:** the message getting to and from the brain
 - ▶ **Urologic Function:** the ability to produce urine and store it in the bladder
 - ▶ **Psychological Function:** cognition, perception, ability to interpret the message
 - ▶ **Mobility:** the physical activity to get to and use appropriate facilities
- 

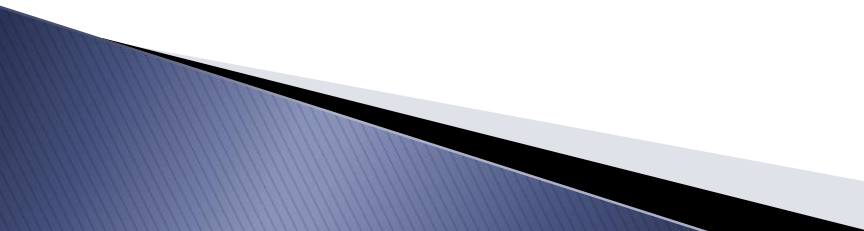
Urinary Incontinence

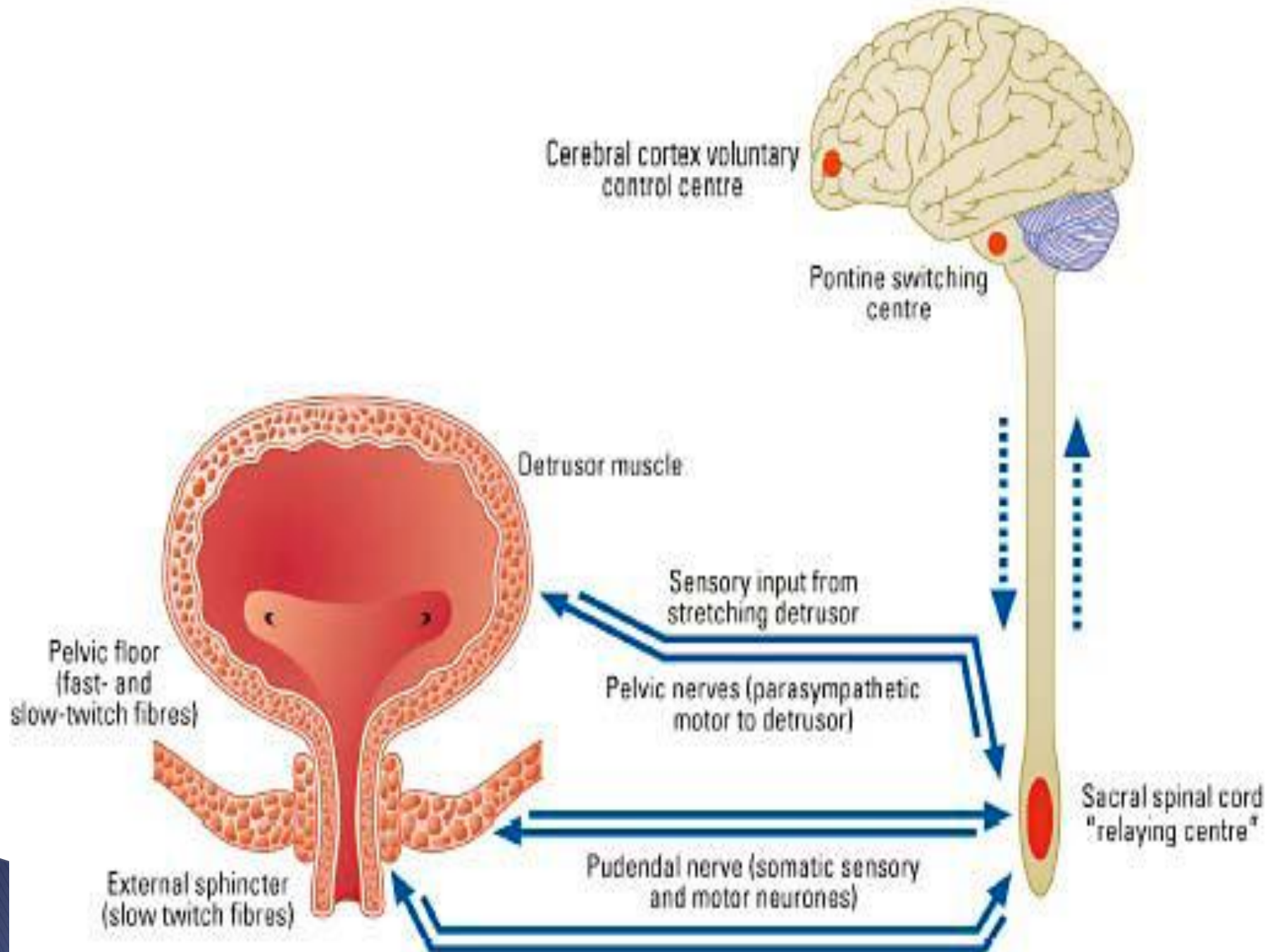
- ▶ Up to 80 % of stroke patients have incontinence or continence issues during their acute admission
- ▶ Urinary incontinence at 24 hours post stroke is a predictor of functional outcome
- ▶ Incidence decreases to 20 % by 6 months post stroke
- ▶ 1 in 4 women experience urinary incontinence
- ▶ 1 in 10 men experience urinary incontinence

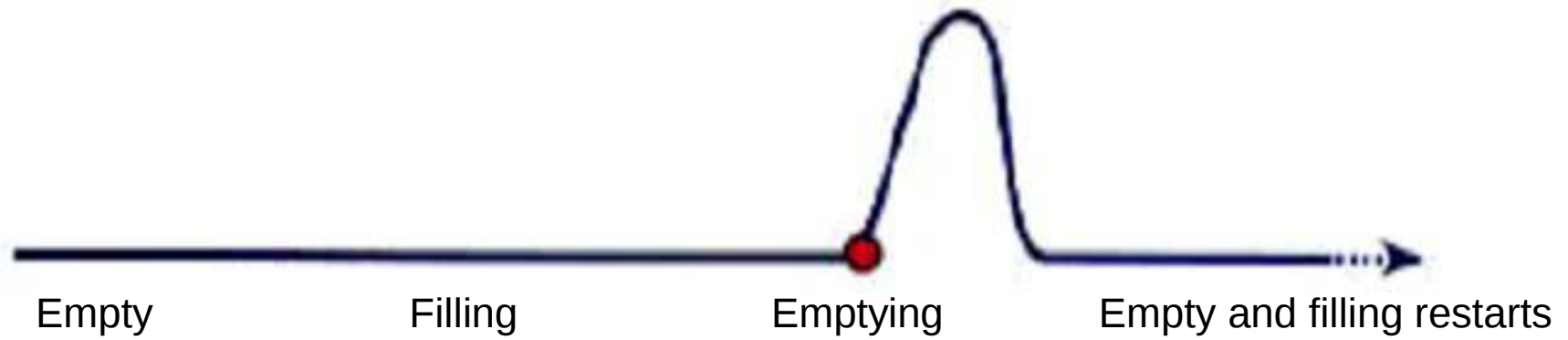




Normal Bladder Function

- ▶ Receptors in detrusor muscles send message via spine reflex arc through pons/basal ganglia to frontal lobes
 - ▶ Message returns to detrusor muscles to relax
 - ▶ Internal and external sphincters relax
 - ▶ Bladder neck and external sphincters relax
 - ▶ Detrusor muscle contracts causing an increase in intravesical (bladder) pressure and voiding occurs
- 





**Detrusor muscle relaxes
+
Urethral sphincter tone
+
Pelvic floor tone**



**Detrusor muscle relaxed
+
Urethral sphincter contracts
+
Pelvic floor contract**



**Detrusor muscle contracts
+
Urethral sphincter relaxes
(voluntary control)
+
Pelvic floor relaxes
+
Micturition**

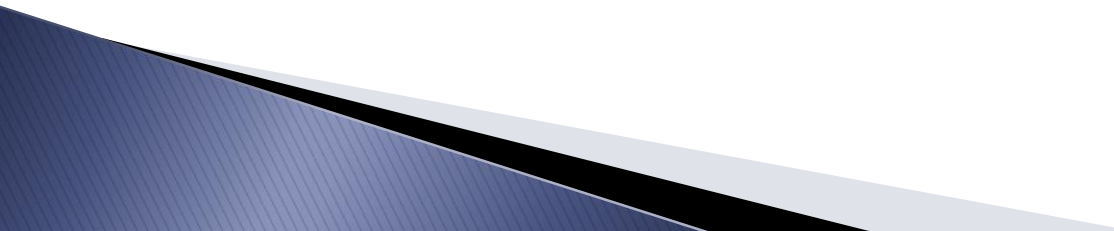


**Detrusor muscle relaxes
+
Urethral sphincter tone
+
Pelvic floor tone**

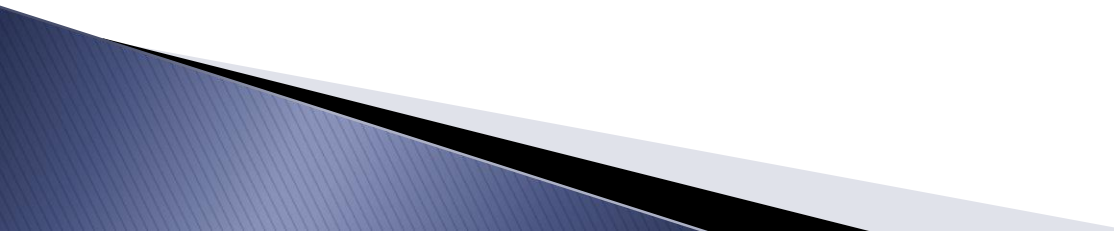
Age Related Changes

- ▶ Thinning of the bladder wall: the bladder spontaneously empties at smaller volumes
 - This results in more frequent, less controlled voiding
- ▶ Diminished bladder capacity: the bladder may hold only 250 – 300 cc of urine instead of the 500 – 600cc in the normal adult
 - This results in the older adult needing to void more frequently
- ▶ Inability to empty the bladder completely
 - This results in urinary retention. The bladder becomes like an over stretched balloon, unable to regain its original shape because of loss of elasticity

Types of Incontinence

- ▶ Urge Incontinence
 - ▶ Retention with overflow
 - ▶ Functional
 - ▶ Stress
- 

Urge Incontinence

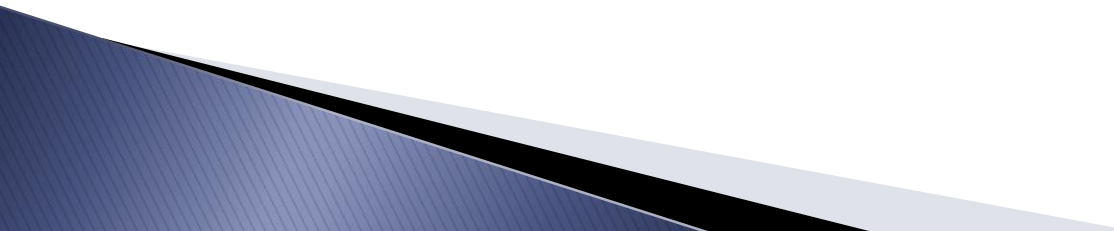
- ▶ Urine is lost involuntarily
 - ▶ Is a strong unstopppable urge to urinate
 - ▶ Occurs during day and night time hours
 - ▶ Related to detrusor muscle hyperreflexia
- 

Urge Incontinence

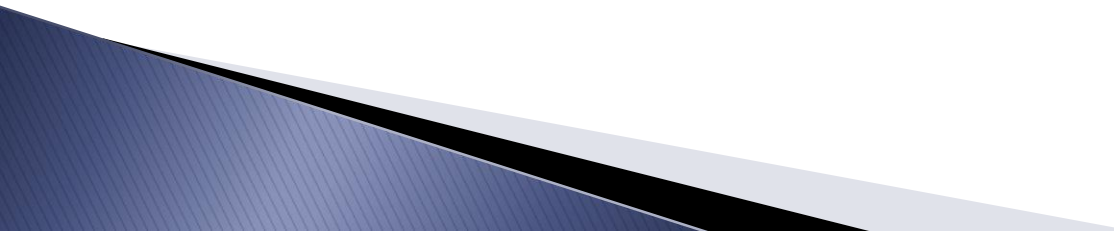
- ▶ May be due to neurological disorders:
 - Impaired sensation
 - Impaired response to urges
 - Impaired sense of awareness
- ▶ Other considerations
 - Infection
 - Constipation
 - Caffeine, medications
 - Atrophic Changes

Retention

Causes:

- ▶ Neurogenic Issues
 - ▶ Urethral Strictures
 - Benign Prostatic Hypertrophy
 - ▶ Medications
 - ▶ Antispasmodics
- 

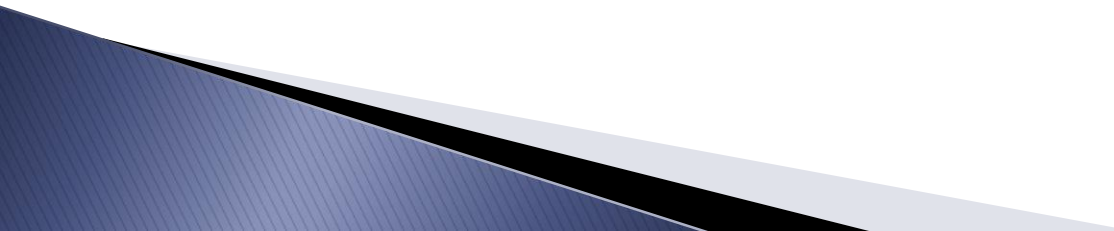
Retention with Overflow

- ▶ Urinary dribbling may be continuous or intermittent
 - ▶ Related to Underactive Bladder
 - ▶ Obstruction in Urinary Outlet
- 

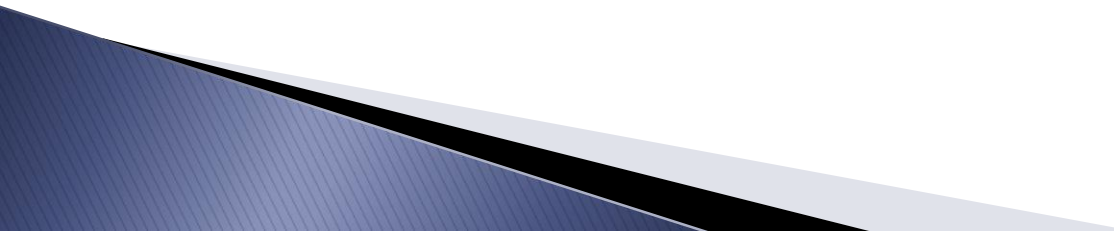
Functional Incontinence

Client is unable or unwilling to toilet:

► CAUSES:

- Cognitive Impairments
 - Physical Impairments
 - Psychological Factors
 - Environmental Factors
 - Age Related Factors
- 

Stress Incontinence

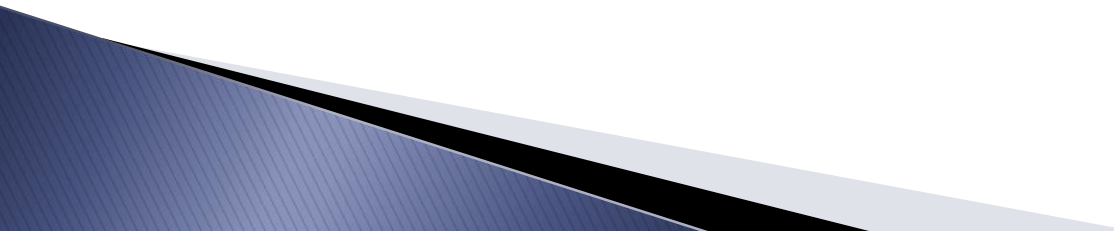
- ▶ Urine loss occurs involuntarily with sudden increase in intra abdominal pressure
 - ▶ More common in women
 - ▶ Usually associated with urethral sphincter weakness
- 

Helping the Survivor

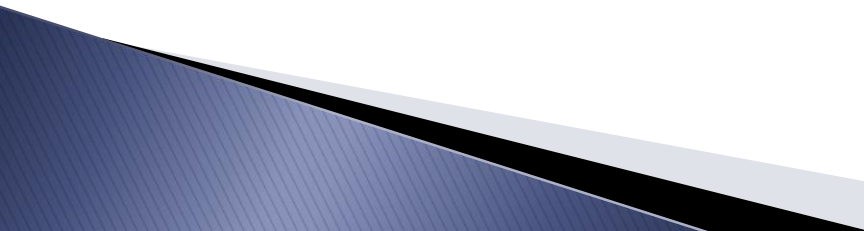
- ▶ Complete an incontinence history, including pre-stroke baseline
 - ▶ Onset, duration of incontinence
 - ▶ Intake amounts and time
 - ▶ Bowel function
 - ▶ Medical history and medications
 - ▶ Psychosocial factors
 - ▶ Functional assessment
 - ▶ Abilities assessment
 - ▶ Physical assessment
 - ▶ Product Use
- 

Develop a Strategy for the Survivor

► Considerations

- Age
 - Cognitive Awareness
 - Mobility Issues
 - Swallowing and Nutrition Issues
 - Voiding Patterns
- 

Helping the Survivor

- ▶ Bladder Retraining Strategies
 - ▶ Use of catheters/external devices
 - ▶ Prompted voiding
 - Monitoring
 - Prompting
 - Praising
 - ▶ Timed voiding
- 

Helping the Survivor

- ▶ Medications
 - Beneficial effects
 - Adverse Effects
- ▶ Incontinence Products
 - Best use practices

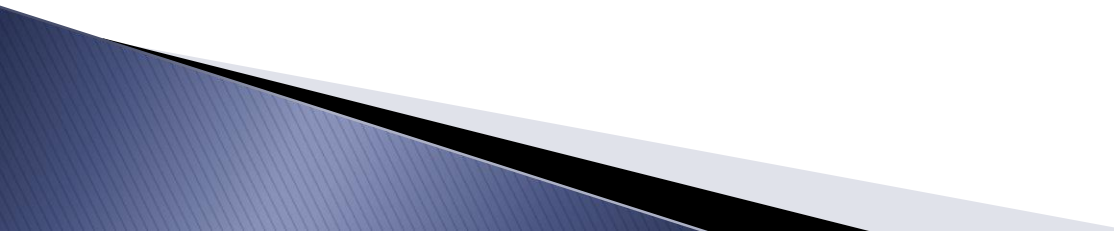
Helping the Survivor

- ▶ Understand the use and role of assistive devices
 - Urinals, bedpans
 - Commode chairs
 - Mechanical lifts
 - Catheters and other products
- 

Helping the Survivor

- ▶ Be observant for symptoms of urinary tract infections (UTI)
 - Increase in frequency of voiding or incontinent episodes
 - Complaints of increased urgency
 - Burning or pain when voiding
 - Cloudy, strong smelling urine
- ▶ Changes in behavior, especially increased agitation when unable to communicate symptoms

Reducing Risks of UTI's

- ▶ Ensure adequate fluid intake
 - ▶ Encourage an increase in fluids (where appropriate) when the survivor experiences burning during urination
 - ▶ Restrict caffeine intake to 2 cups a day or less
 - ▶ If excessive night voiding is a problem, adjust the timing of the fluid intake (not the amount per day) so more is taken earlier in the day and only 1 cup is taken after 7 p.m.
 - ▶ Report any change in bladder function to prompt for further investigation
- 

Helping the Survivor

- ▶ Psychosocial Effects of Incontinence
- ▶ Case Study Discussion

