

**Overview of Geriatrics**

- How to age successfully
- Anti-Aging products/profession will continue to increase by 10-20%
- If the Geriatric population grow Medicare will become very important to us
  - 65% of Chiropractor's notes didn't document medical necessity
  - If we're more willing to take Medicaid patients we'll be more likely to get more from Medicare patients

**Common Geriatric Syndrome**

- Falls
  - Weak bones, Weak muscles, COG off
  - "Do you fall? How often?"
- Urinary Incontinence
  - Good easily wet themselves when we try to adjust them
  - Have them go to the restroom first before they go into the room
- Confusion
  - Important to have someone else with them to help them substantiate the info
- Immobility
  - Will lead to gaining of weight, heart disease, etc
- Sleep Disorders
  - Could be in pain
  - Financial problems
  - Sleep/Wake cycle gets reversed
    - That's why mall walking is very important- give patients instructions to be up at 6 or 7 AM
- Fatigue
  - Often because they're anemic
  - "What are you eating" "Are you on an aspirin a day"
- Weight Loss

**Hidden Illnesses in Older Adults**

- |                             |                      |
|-----------------------------|----------------------|
| • Depression                | • Falling            |
| • Hearing Loss              | • Poor nutrition     |
| • Incontinence              | • Alcoholism         |
| • Dementia                  | • Osteoporosis       |
| • Musculoskeletal stiffness | • Osteoarthritis     |
| • Dental problems           | • Sexual dysfunction |

**Altered Presentations of Specific Illnesses**

- Depression without sadness
- Infectious disease without fever, leukocytosis, or tachycardia
- MI without chest pain
- Nondyspneic pulmonary edema
- Silent malignancy (mass w/o symptoms)
- Silent surgical abdomen
- Apathetic thyrotoxicosis

★ *Don't take anything for granted- they will present differently*

**Modified Presentation**

- Altered central processing
  - Reduced cognitive status from direct effect on brain from acute illness or pre-existing dementia
- Negativity regarding aging
  - Accepted as what is likely to happen with old age
  - Tolerance of insidious illness leads to ignorance of the acute illness
  - Don't let them use their age as an excuse
- Fear
  - Of illness itself or of treatment consequences

**Classic Geriatric Syndromes**

- |                                |  |
|--------------------------------|--|
| • Dementia                     | • Behavioral changes                   |
| • Delirium                     | • Weight Loss                          |
| • Urinary incontinence         | • Dizziness                            |
| • Falls and gait abnormalities | • Poor nutrition or feeding impairment |
|                                | • Sleep disorders                      |

**Patient Centered Care**

- Exploring the disease and illness experience with the patient
- Understanding the whole person
- Finding common ground regarding management
  - Most geriatrics will have multiple health care providers
  - You need to fit within that provider system
- Incorporating prevention and health promotion
- Enhancing the doctor/patient relationship
- Being realistic

★ *Geriatric patient are better in the morning so have them see you in the morning when your office is slower*

★ *Get a hold of a list of different activities in the area for geriatrics and have contact people*

★ *Be real with geriatric patients, realistic explanations and explain to them- if Geriatric patients like you they'll tell everyone*

**Nonspecific Symptoms of Specific Illnesses**

- Confusion
- Apathy
- Self neglect
- Anorexia
- Falling
- Dyspnea
- Incontinence
- Fatigue

**Geriatric-Specific Disease Entities**

- Osteoporosis
- Alzheimers
- Stroke/CVA
- Hip Fracture
- Polyarthralgia rheumatica/temporal arteritis
- Parkinson's
- Pressure sores
- Macular degeneration
- Sexual dysfunction
- Gonadal failure in men

**Specific Geriatric Topics in ROS**

- General
  - Weight change
    - What are you eating? Are you active?
  - Sleep quality
    - How much? When do you sleep?
    - Altered sleep/wake cycle - could be very dangerous
  - Depression
  - Hearing loss
  - Falls
  - Alcoholism
- Neurologic
  - Memory loss
  - Confusion
- Musculoskeletal
  - Prior fractures- indicating prior falls
  - Pain
  - Range of Motion
    - How do you turn your head/body to back out of the driveway
  - Weakness
- Genitourinary
  - Incontinence
    - How many times a night do you get up
    - How hard is it to get to your bathroom
  - Nocturia
  - Sexuality

**Social Assessment of Older Patient**

- Content of average day
- Suitability/safety of home
- Availability/attitude of caregivers
- Availability of emergency help
- Services received and/or needed
- Transportation needs
- Financial status
- Occupational history and interests

*Family abuse to the elderly is the most prevalent type of abuse*

**Gait Disorders**

- Congenital deformity
- Post orthopedic surgery
- Vertebrobasilar insufficiency
- Heart Disease
- Idiopathic gait disorders; fear of falling
- Other contributors
  - Deconditioning
    - Muscle weakness and decreased mass
  - Brain changes
    - Ventricular enlargements
    - Subcortical and basal ganglia infarcts
  - Co-impairments
    - Weakness AND
      - balance deficits
      - Sensory deficits

**Gait Disorders**

- PE checklist-gait specific
  - Initiation problems
  - Asymmetric weight distribution
  - Trunk sway
  - Bowing of femur or tibia
  - Hip rotations
  - Abduction/Circumduction of LE
  - Width of base
  - Foot position
  - Step and stride length
- Motion - related deficits
  - Vestibular
  - Orthostatic
- Musculoskeletal deficits
  - Pain
  - Deformity
  - ROM of LE/spine
  - Leg length discrepancies
- Neurologic deficits
  - Strength
  - Muscle tone
  - Reflexes
  - Sensory integrity
  - Coordination
  - Balance
- Other systems as necessary
  - Cardiovascular/visual

1/23/09 Hanna's notes

- Geriatrics begins at age 50. Everything changes at 50.
- The normal cell has about 50-60 divisions within it before you get into a risk category. This occurs around age 50.
  - You take family history to determine risk factors, so you can make good clinical decisions relative to their wellness health strategies
- Cellular mutations within DNA can cause problems with cellular replication, like cancers.
  - Addition, deletion, fragmentation are forms of mutations
- At age 50ish what are some of the things that you begin to experience?

- Erectile dysfunction
  - Endocrine change contributes
  - Parasympathetics drive this system
    - Bulbo cavernosus contracts and obstructs venous drainage from erectile tissue, in older men they can have difficulty because they have decreasing blood flow entering due to arteriosclerosis (can happen in men and women really, ie dryness)
  - In hypo-perfused states of muscles around the erectile tissue, the metabolic demand goes up and vascular delivery is shunted to high demand areas and it leaves the erectile tissue
  - In athletes, this can occur due to performance enhancing drugs (steroids)
    - After parasympathetics develop and maintain erection
      - ◆ Sympathetics create peristalsis to cause ejaculation
- Osteoarthritis
  - Diffuse aches and pains - brings people into chiro office
- Cholesterol changes
  - Decreased levels of activity lowers total cholesterol and increases LDLs and lowers HDLs
- Prostatic hypertrophy
- Blood pressure changes
  - Carotid sinus (baroreceptor, vs carotid body which measures gasses) at bifurcation of vessel regulate BP (afferent innervation is CN9)
    - If there are atherosclerotic changes at the bifurcation of the vessel (fat pad) it will cushion the carotid sinus and it won't read the pressure as high as it is so it will think that it needs to send a signal to raise BP
  - JG apparatus measure pressure (filtration rate) in renal system
    - Poor renal perfusion will cause change in renin which will convert angiotensinogen to angiotensin I --> angiotensin II and will cause high BP
  - Pain (like from hip problems, etc) will also increase BP so we can help patients with high BP by keeping their pain under control
- Pre-senile dementia
  - Is it pre-alzheimers or multiple infarcts interrupting neural pathways?

- ★ Medical model would prescribe Statins for atherosclerosis and Diuretics for renal function
  - Ca blocker
  - Beta blocker
  - ACE inhibitor
  - Alpha agonists
- Obese w/ diabetes will also be on an hypoglycemic agent like insulin, or glucophage methoman to bring down blood sugar
- Obese will also be on NSAIDs
- SSRI

★ **Textbook for this class is expensive and not necessary. However he says it's a good book that gives cliff notes of geriatric diseases and how they progress.**

### Gait Disorders

- Other contributors
  - Deconditioning
    - Muscle weakness and decreased mass
      - Due to lack of use
  - Brain changes
    - Ventricular enlargements
    - Subcortical and basal ganglia infarcts
  - Co-impairments
    - Weakness AND
      - Balance deficits
      - Sensory deficits

★ Core stability is necessary for balance - vestibulospinal pathway

★ Brain shrinks due to lack of use  
Lack of movement can cause cortical atrophy as well since the brain is responsible for movement  
Neural tissue in brain is not unlike muscle tissue in developing atrophy with disuse. More use = less ventricular enlargement and fewer infarcts

### Gait Disorders

- PE checklist - gait specific
  - Initiation problems
  - Asymmetric weight distribution
  - Trunk sway
    - Basoganglia
  - Bowing of femur or tibia
    - Osteoporotic changes
  - Hip rotations
  - Abduction/circumduction of LE
    - Bring leg out and around when they walk
  - Width of base
  - Foot position
  - Step and stride length
  - Motion - related deficits

★ Piza syndrome - affects only axial skeletal muscle, goes with parkinsons  
Causes pt to lean (tower) to one side

- Vestibular
- Orthostatic
- Musculoskeletal deficits
  - Pain
  - Deformity
  - ROM of LE/spine
  - Leg length discrepancies
- Neurologic deficits
  - Strength
  - Muscle tone
  - Reflexes
  - Sensory integrity
  - Coordination
  - Balance
- Other systems as necessary
  - Cardiovascular/visual

★ *Broader base when they walk - heels should strike 2 inches apart but as people age they tend to broaden their base because their balance is worsening*

★ *People that fall are people who walk too fast or too slow  
Too slow: its like thinking about not spilling a cup of coffee while you walk vs letting your cerebellum take care of it. Cerebellum is better than your conscious thought when it comes to balance. So elderly that are walking slowing and thinking about each step are more likely to fall.*

★ *People with true leg length deficiencies are more prone to falling*

1/30/09

#### How does Cardiac system impact gait disorders

- Stenotic mitral valve
  - Leads to hypotension due to inability to get blood
  - Increase in core pressure
- Mitral Valve Prolapse
  - Floppy valve- blood goes out aorta or up mitral creating decrease perfusion
  - Ejection fraction declines
- Aortic Stenosis- ejection fraction declines
- Intermittent claudication felt most frequently in calves
- Chronic aortic/iliac occlusion- get a saddle like aching
  - Syndrome of Leriche

- *Rhabdomyolysis is side effect of statins*
- *Diabetic retinopathy can cause tunnel vision- peripheral vision loss*
- *Macular degeneration can cause central vision loss*

#### Consequences of Immobilization

- Stiffness and contractures
- Loss of muscle strength
- Sensory loss, confusion, depression
  - Brain shut down by lack of movement
  - Memory and emotional stability improved with movement
- Dependence and institutionalization
  - Which further scares them and leads to short term acute brain failure (delirium)
- Instability and loss of confidence
- Dehydration and electrolyte imbalance
- Malnutrition
- Osteoporosis
- Thrombosis: arterial and venous, PE
- Pneumonia and atelectasis- blood pools when patient is on back for long periods of time
- Hypothermia
- Pressure and sores
- UTI, retention, calculi, incontinence
- Constipation, Impaction or Incontinence

#### Common Neurologic Changes

- Cranial Nerves
  - Unequal pupils
  - Diminishes reaction to light and near
- Auditory
  - Hearing loss for higher tones
- Olfactory
  - Diminished sensitivity
- Reflexes
  - Diminished or absent jerk (15%)
  - Romberg abnormality (14%)
    - We don't exactly know why
- Extrapyramidal function- basal ganglia failing (blood supply is failing- ischemic penumbra)
  - Abnormal Gait (20%)
  - Increase tone in legs (22%)
  - Decrease arm swing (29%)
  - Tremor (17%)
  - Decrease spontaneous movements (14%) because of rigidity
  - Flexion posture

"TRAP"- Tremor, Rigidity (both ways),  
Akinesia/Bradykinesia, Postural Reflex Loss

- Motor System
  - Diminished muscle strength
  - Diminished reaction time
- Sensory System
  - Diminished vibratory sensation
    - Frequency of firing due to vibration loss
  - Mild increase in threshold for light touch, pain, temperature
    - Receptors are failing
- Pathologic Reflexes- all of higher centers that inhibit these reflexes have started to decline
  - Snout (32%)
  - Grasp (28%)
  - Root (13%)

### Health, Exercise and Nutrition

- Smoking Cessation
  - Elderly less likely to receive counseling
  - Same quit rate as younger individuals
    - 70% desire to quit
    - 46% attempt
- Alcohol Abuse
  - 5.6% of those over 65 involved in binge drinking
  - Benefit/Risk analysis
    - 1 or 2 drinks/day lower lipid levels
      - ◻ Decrease mortality following MI
      - ◻ Decrease of developing CHF
      - ◻ Lowers risk of ischemic stroke
      - ◻ Not associated with cognitive decline
      - ◻ Reports to feeling good
- Prevention
  - Polypharmacy- taking more than 4 medications
    - Review of meds at encounters
    - Awareness of side effects
    - Interactions with other meds/herbs/etc
    - Knowledge of behavioral strategies to reduce medication dosages
      - ◻ Diet
        - ◆ Grapefruit and cumidin shouldn't be taken
      - ◻ Exercise
      - ◻ Stress management
- Physical Activity
  - CDC and NIH recommend that older individuals engage in 30 min of physical activity most days of the week
    - Aerobic
      - ◻ Walking, dancing, swimming, biking
    - Resistance training
      - ◻ Weights, elastic bands
    - Flexibility
      - ◻ Light stretching, tai chi
  - Can be done individually or in group settings
  - Dependent upon
    - Individual preference
    - Cognitive preference
    - Motivational level
    - Physical abilities

*Need to look up side effects  
Name, Dosage, Frequency*

*Most common drugs patients will be on:*

- *Anti-hypertensive*
- *Statin*
- *Anti-inflammatory*
- *Oral Hypoglycemic agent*
- *Narcotic*
  - *If on codeine it slows bowel movement causing constipation*
- *Anti-depressive*

2/6/09

#### **Quiz Next Friday 2/13**

Ch. 15, 16, 17 on Dementia, Depression, Delirium

Depression is accentuated by their health status

Delirium is acute brain failure- fluctuation day to day, hour to hour

Dementia- have to determine if Alzheimers

These three blend together

Depression to Delirium isn't quite as bad as Depression to Dementia

## Health Issues

### Cardiovascular Health

- Improves myocardial performance
- Increases peak diastolic filling
  - Will increase ejection fraction and better perfuse the tissues
- Increases contractility
  - Takes less work to get the job done
- Reduces PVCs
  - We're now synchronizing contractility/smoothing everything out by normalizing stretch and response
- Improves lipid profile
- Increases aerobic capacity
- Reduces systolic pressure
  - If reduce to far we shut the system down
  - Through exercise and regulatory mechanisms of hyperthalamus the human body won't let systolic pressure get too low on its own
- Increases endurance
  - Machinery is refined and aerobic capacities improved
  - Supplementing Creatine can help
    - Creatine is absorbed by the cells and binds to phosphate to get phosphocreatine- phosphate binds are important for energy so if someone has been taking creatine for three weeks prior to head trauma, brain damage will be decreased
- Improves muscle capillary flow
  - Because of exercise capacities
  - When you damage tissue new blood vessels like to move in

*Vagal connections in the brainstem and reticular system can shut down the "circuit" of the heart*

*Fat/plaque is deposited into the lumen of the intima of the vessel wall as vessels age. This will increase blood pressure in order to get all the "stuff" through*

**Pulse Pressure:** Diastole + 1/2 pulse pressure

### Metabolism

- Increases energy expenditure
- Improves rate of protein synthesis and AA uptake into muscle
- Reduces LDLs
- Reduces cholesterol/very low density lipoproteins
- Reduces triglycerides
- Increases HDLs
- Increases glucose tolerance

### Psychological Well Being

- Improves perceived well being and happiness
- Decreases levels of stress-related hormones
- Improves attention span
- Improves cognitive processing speed
  - Activating limbic pathway-system is more efficient
- Increases slow wave and REM sleep
- Decreases anxiety and improves overall mood
- Provides sense of accomplishment

★ *Nutritional status and cost effectiveness: Provide Bfast - PR and social interaction- providing social interaction, nutritional support and recruiting new patients passively*

### Functional Capacity

- Reduces risk of musculoskeletal disability
- Improves strength and flexibility
- Reduces risk of falls
- Improves dynamic balance
- Improves overall physical functional performance

*Thyroid disease can promote bone loss  
Patients with long term corticosteroid can promote bone loss*

*Patients with thyroid disease and asthma should be referred to bone density study*

### Health Issue

- Body Composition
  - Decreases abdominal adipose tissue
  - Increases muscle mass
- Bone Health
  - Slows decline in mineral density
  - Increases total body calcium and nitrogen
- Fall Prevention
  - Decreases falls and fear of falling

Medicare Inducement laws states that you can't give away more than \$10 per event and/or anything greater than \$50 per year

Medicare pays ONLY for the adjustment

### Nutrition

- First factor is intake
  - Inadequate intake can result in
    - Weight loss
    - Loss of muscle mass
    - Decreased strength and power
    - Reduced gait capacities
    - Impaired balance
    - Overall activity decline
- Water
  - Inadequate hydration can result in
    - Constipation

- Fatigue
- Dizziness
- Breathing difficulties
- Irregular heartbeat
- Fats
  - Raise cholesterol levels
  - Increase risk of heart disease
  - 20-35% of total calories should be from fat
  - Monounsaturated fats are best
    - Lower LDL
    - Leave HDL intact
  - Polyunsaturated fats
    - lower LDL and HDL
- Fiber
  - Is a natural laxative
  - Adds bulk to stool
  - Absorbs water
  - Reduces time stool remains in bowel
  - Recommended intake is 14g/1000 calories
    - Cereal fibers
- Protein
  - Form antibodies for disease prevention
  - Enable growth and repair of tissues
  - Should make up 12-20% of caloric intake
  - Illness may reduce protein intake and result in deficiencies

### Cancer Screening

- Breast Cancer
  - Guidelines vary by organization
- Cervical Cancer
  - Recommend against screening older women if had negative tests in the past
- Prostate Cancer
  - No consistent guidelines for screening
  - Recommend DRE and PSA annually for men over 50
- Colon Cancer
  - 90% of cases occur in people over 50
  - People with risk factors should be targeted
    - Family history
      - Polyps, colon CA, inflammatory bowel disease
  - Focus is on identifying pre-malignant adenomatous polyps
  - Directed towards prevention
  - No single best test
    - Fecal occult blood
    - Colonoscopy
    - Flexible sigmoidoscopy
    - Double contrast barium enema
    - Virtual colonoscopy is newest strategy

## Dizziness

3/6/09

- Is a common complaint in the geriatric population
- Presents both a diagnostic and a management challenge
- Is subjective and cannot be effectively measured
- Can be produced through several different mechanisms
- More commonly reported by women than men aged 65 and older
- Likelihood of reporting dizziness increases by 10% for every 5 years of increasing age
- Has been associated with
  - Increased fear of falling
  - Worsening depressive symptoms
  - Worsening self-rated health
- Chronic dizziness has been associated with
  - Increased risk for falls
  - Orthostatic hypotension
  - Syncope
  - Stroke
  - Disability
    - In one study, after 2 years of follow up, patients with dizziness were more likely to become disabled than those who were not
- Refers to a variety of abnormal or disturbing sensations related to body position, movement, or stability
- Disturbances in any one of the body's multiple postural stability controls systems can generate the perception of dizziness

★ Dizziness is a huge contributor of the falling problem with elderly people

### Postural controls

- Cerebral cortex
- Brainstem
- Cerebellum
- Eyes/visual pathways
- Labyrinth/vestibular pathways
- Proprioceptors
  - Peripheral joints
  - Spindles

### Dizziness as a geriatric syndrome

- 51% of elderly report dizziness if they have four or more of the following
  - Depressive symptoms
  - Cataracts
  - Abnormal gait
  - Postural hypotension
  - Diabetes
  - S/P myocardial infarction
  - Use of 3 or more meds

### Clinical History -Steps must include:

- Identifying the dizziness subtype
- Establishing duration of dizziness
- Determine if the dizziness is episodic or constant

- Medication review

- Antidepressants

- SSRI - celexa, paxil, prozac, zoloft, lexapro
    - TCA - norpramin, sinequan, vivactil

May generate dizziness by contributing to orthostatic hypotension

- Antihypertensives

- Antihistamines

- Claritin, zyrtec, singulair, allegra

- NSAIDs

- Loop diuretics - furosemide

- Aminoglycosides - Streptomycin

- Anxiolytics- Xanax, Valium

- Antipsychotics- Haldol, Zyprexa, Risperdal

- Antiepileptics- Klonopin, Tranxene, Depakote, Dilantin, Tegretol

- Chemotherapeutic agents

- Above three also may contribute to dizziness

NSAIDs, loop diuretics and aminoglycosides May create ototoxicity in higher doses or over long periods of time, especially when renal function is impaired

- Dizziness subtype

- Classically divided into four types

- Vertigo

- Illusion of movement, usually rotational
      - Disturbance within the vestibular system or pathways
      - Causes are

- Acute neuro-labyrinthitis

- Viral or vascular injury to all or part of labyrinth
          - Rapid onset of vertigo accompanied by
            - Nausea
            - Vomiting
            - Diaphoresis
            - Horizontal nystagmus

- In younger patients, vertigo subsides within a week

- In older patients, resolution is much slower and frequently with residual disequilibrium

- If the auditory portion of labyrinth is effected, hearing loss and tinnitus may be present

- Acute cerebellar hemorrhage or infarct must also be considered in patients with risk factors

- Patients with this appear as vestibular vertigo, but will have cerebellar signs of incoordination

- Patients with this profile must be imaged immediately

- Recurrent vestibular syndromes

- Recurrent attacks lasting hours to days are common

- With tinnitus and hearing loss, referred to as Meniere's Disease

- When consisting of just "dizziness" referred to as recurrent vestibulopathy and is milder than Meniere's- may be migraine related

- BPPV (Benign Paroxysmal Positional Vertigo)

- Very common among the elderly

- Presents as bouts of vertigo lasting less than one minute and is brought on by positional changes

- Attacks come in clusters lasting 1-2 weeks with intervals of months to years without symptoms

- Most cases caused by otoliths dislodged from utricle or saccule that migrate into posterior semicircular canal

- These amplify rotational movement in that plane

- These people respond well to Epley's maneuver because it Repositions the canolith that's floating in endolymph fluid in canal and desensitizes vestibular neurons to accommodate to the change

- Presyncopal lightheadedness

- The sensation that one is about to pass out
          - Severe lightheaded feeling
          - Associated with unsteadiness or sense of falling
          - Occurs because the cerebral cortex is inadequately perfused
          - Common causes in the elderly are
            - Orthostatic hypotension (OH)
            - Vasovagal episodes
            - Medications
            - Anemia
            - Viral infections
            - Cardiac arrhythmias
            - Carotid Sinus Syndrome (?)

- Dysequilibrium

- Sense of imbalance
          - Multisensory disorder arising from combinations of musculoskeletal problems that interfere with gait
            - Arthritis

★ Remember D's and N's of Stroke:  
Dizziness, Diplopia, Distharthria,  
Dysphasia, Nystagmus,  
Numbness, Nausea

- ◆ Proprioceptive deficits
    - ◆ Diabetic peripheral neuropathy
  - Cervical spondylosis
    - ◆ Proprioceptive vs. Vascular
  - Cerebellar disorders
  - Visual system disorders
  - Neurodegenerative disorders
    - ◆ Parkinsonism
  - Other
    - Anxiety and/or depression
      - ◆ Vague lightheadedness or floating sensation
    - Cerebrovascular disease
      - ◆ Posterior circulation disorders
        - ◇ 25% of posterior circulation strokes begin with vertigo
    - Acoustic neuroma
      - ◆ Insidious onset of progressive unilateral hearing loss with vertigo or disequilibrium and accompanied by other CN signs
  - A fifth variety may be that of a "mixed" dizziness
- Duration
    - Acute
      - Present for less than 2 months
      - Usually from disorder of 1 system
    - Chronic
      - Present for greater than 2 months
      - Most often secondary to combined effects of disorders from multiple systems
  - Nature
    - Episodic
      - Identify frequency and duration as well as associated symptoms
    - Continuous
      - If it begins abruptly and either remains the same or improves, things to consider are
        - Stroke
        - Cerebellar degeneration
        - Drug reaction
        - Anxiety/depression
  - Provocative/Precipitating factors
    - Positional change (rolling in bed, moving head/neck) that generates dizziness is usually cervical or vestibular etiology
    - Dizziness on standing from supine position is likely postural or OH
    - If after eating a meal, may be postprandial hypotension
    - Dizziness after a recent medication change may be pharmacology related
    - If a recent mood change is detected, consider depression as a possible cause

### Physical Examination

- When the yield on a routine physical is not helpful
  - Forced hyperventilation
    - Tachypnea 20-30 per minute for 2-3 minutes
  - Head Thrust Test
    - Evaluates VOR
    - Patient fixes eyes on examiner's nose while head is rapidly rotated 10 degrees
    - Eyes should remain fixed on target
    - If deviation with corrective change, suspect vestibular disease
  - Fukuda Stepping Test
    - Marching in place with eyes closed and arms extended in front for 30 seconds
    - Patients with reduced or absent vestibular function will rotate more than 30 degrees
    - Caution must be used to prevent auditory queing
  - Dix-Hallpike Maneuver for BPPV
  - Patient seated on table
  - Turn patients head 30 degrees and rapidly lay the patient backward and extending head off end of table
  - Hold 10 – 20 seconds or until nystagmus dissipates and return patient to seated position
  - Repeat by rotating patient's head opposite direction
  - Classic positive response is
    - Vertigo
    - Torsional nystagmus (rotational)
    - Initial latency preceding symptoms
    - Fatigue of symptoms with repeated procedures

### Laboratory Testing

- CBC and metabolic panels
- Audiometry
- ECG
- Brainstem auditory evoked responses
- Doppler exam of cranial arteries
- Brain MRI
- Electronystagmography (ENG)

### Syncope

- Sudden loss of consciousness and loss of postural tone with spontaneous recovery
- Distinct from dizziness, vertigo, seizures, mental status changes, drop attacks and cardiac arrest
- Over a 10 year period, approximately 6% of people will experience syncope
- This increases rapidly after age 70
- Underlying pathology is inadequate oxygenation of the cerebral cortex or RAS
  - Reduced flow through cerebral arteries
  - Reduced cardiac output
  - Impaired oxygenation
  - Peripheral vasodilation
  - Diminished venous tone leading to pooling of blood
- Elderly have higher number of underlying chronic conditions that may contribute
- Take more medication which may contribute
- Have more age related factors
  - Atherosclerosis
  - Increased endothelin production
  - Left ventricular dysfunction
  - Cardiac valvular disease
  - Autonomic blunting

#### Mnemonic to remember causes of syncope

- HEAD
  - ◇ HYPOXIA, EPILEPSY, ANXIETY, DYSFUNCTION OF BRAINSTEM
- HEART
  - ◇ HEART ATTACK, EMBOLUS, AORTIC OBSTRUCTION, RHYTHM DYSFUNCTION, TACHYCARDIA
- VESSLS
  - ◇ VASOVAGAL, ECTOPIC PREGNANCY (HYPOVOLEMIA), SITUATIONAL, SICK SINUS, LOSS OF PERIPHERAL VASOMOTOR TONE, SUBCLAVIAN STEAL