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Comprehensive Physical Assessment in Older Adults

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1. Define comprehensive physical assessment in geriatric populations
2. Discuss the components of the medical, psychological, social, and environmental and functional elements of the physical examination
3. Review and discuss how various systems change with normal aging
4. Use case based approach to integrate and apply critical assessment, appropriate documentation, and critical thinking to patient scenarios

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Comprehensive Geriatric Assessment

An interdisciplinary approach to the evaluation of older persons' physical and psychosocial impairments and their functional disabilities

3-step process:

1. Targeting appropriate patients
2. Assessing patients and developing recommendations
3. Implementing recommendations

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Purpose

- First priority:
 - Prevention of decline in independence with ADLs
 - Drives clinical decision-making and process of diagnosis
- Screening:
 - Preventable diseases
- Functional impairments that may result in physical disability and amenable to intervention

Rationale

- Early detection of risk factors for functional decline
- Specific interventions can reduce incidence of functional disability and dependency

Who Needs Assessments?

- Transitional living situation
- Recent decline in physical or cognitive function
- Fragmented specialty medical care
- Evaluating patient capacity
- Dealing with medico-legal issues



Components of Comprehensive Geriatric Assessment

Component	Elements
Medical assessment	Problem list Comorbid conditions and disease severity Medication review Nutritional status
Assessment of functioning	Basic activities of daily living Instrumental activities of daily living Activity/exercise status Gait and balance
Psychological assessment	Mental status (cognitive) testing Mood/depression testing
Social assessment	Informal support needs and assets Care resource eligibility/financial assessment
Environmental assessment	Home safety Transportation and telehealth



Comprehensive Geriatric Assessment

KATZ INDEX OF ACTIVITIES OF DAILY LIVING

- Bathing
 - Dressing
 - Toileting
 - Transfer
 - Contenance
 - Feeding
- Independent
Assistance
Dependent

Katz S et al. Studies of Illness in the Aged: The Index of ADL; 1963.



Comprehensive Geriatric Assessment

INSTRUMENTAL ACTIVITIES OF DAILY LIVING

- Telephone
 - Traveling
 - Shopping
 - Preparing meals
 - Housework
 - Medication
 - Money
- Independent
Assistance
Dependent

The Oars Methodology: Multidimensional Functional Assessment Questionnaire; 1978.

IADLS

JAGS, April, 1999- community dwelling, 65y/o and older.
Followed up at 1yr, 3yr, 5yr

Four IADLs

- Telephone
- Transportation
- Medications
- Finances

Barberger-Gateau, Pascale and Jean-Francois Dartigues. "Age and Ageing
1993; 22:467-463; Barberger-Gateau, Pascale and Fabrigoule, Colette et al.
"JAGS 1999; 47:466-463

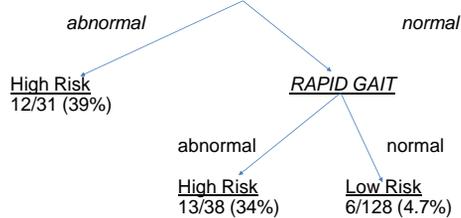
IADLs

At 3yrs, IADL impairment is a predictor of incident dementia

- 1 impairment, OR=1
- 2 impairments, OR=2.34
- 3 impairments, OR=4.54
- 4 impairments, lacked statistical power

"Get up & Go Test"

QUALITATIVE CHAIR STAND



“Get up and Go”

ONLY VALID FOR PATIENTS NOT USING AN ASSISTIVE DEVICE

- Sensitivity 88%
- Specificity 94%
- Time to complete <1min.
- Requires no special equipment

Get up and walk 10ft, and return to chair

- | | |
|------------------|--------------------|
| • Seconds | Rating |
| • <10 | freely mobile |
| • <20 | mostly independent |
| • 20-29 | variable mobility |
| • >30 | assisted mobility |

• Mathias S, Nayak US, Isaacs B. *Arch phys Med Rehabil.* 1986; 67(6): 387-389. 

Visual Impairment

Prevalence of functional blindness (worse than 20/200)

71-74 years	1%
>90 years	17%
NH patients	17%

Prevalence of functional visual impairment

71-74 years	7%
>90 years	39%
NH patients	19%

Hearing Impairment

Hearing Impairment

Prevalence:
65-74 years = 24%
≥75 years = 40%

National Health Interview Survey
30% of community-dwelling older adults
30% of ≥85 years are deaf in at least one ear

Hearing Impairment

Audioscope

A handheld otoscope with a built-in audiometer

Whisper Test

Cognitive Dysfunction

Dementia

Prevalence: 30% in community-dwelling patients ≥85 years

Alzheimer's disease and vascular dementias comprise ≥80% of cases



Risk for functional decline
Delirium
Falls
Caregiver stress

Depression

10% of >65 y/o with depressive symptoms

1% with major depressive disorder

Associated with physical decline of community-dwelling adults and hospitalized patients

Comprehensive Geriatric Assessment

- Other Domains for Assessment:
 - Current health status: nutritional risk, health behaviors, tobacco, and ETOH use and exercise
 - Social assessments: especially elder abuse if applicable
 - Health promotion and disease prevention
 - Values history: advanced directives, end of life care

Comprehensive Geriatric Assessment

- | | |
|---|--|
| Report Outline | Plan of Care |
| <ul style="list-style-type: none">• Rationale for assessment• Medical history• Functional status• Social assessment• Psychiatric status• Advanced directives | <ul style="list-style-type: none">• Services recommended<ul style="list-style-type: none">• Duration, finances• Re-evaluation |

Comprehensive Geriatric Assessment

- How to use the information obtained:
- Integration of the data obtained
 - Avoid pitfalls
 - Diagnosis(es) based solely on poor performance on assessment instrument
 - Ignoring or misunderstanding significance of data (history, social, environmental factors)

Focused History and Physical Exam:

Determine mechanism of injury (MOI) (trauma)

Chief complaint (medical)

- Chief complaint
 - Talk to the patient if possible, not others
 - Use proper name such as Mr., Mrs., Miss
- Patient may not report everything
 - Delay in ambulance
 - Fear (independence, hospital to die, nursing home)
- Obtain SAMPLE history
- Conduct physical exam
- Elicit as much information as possible
- Scan the scene for clues
- Assess baseline vitals
- Perform detailed physical exam

Special Considerations:

- Blindness
 - Position where patient might be able to see you
 - Explain procedures before doing them
 - If patient has glasses make sure they are wearing them
 - Never pull blind patient
 - Walk at their side and hold their arm
 - Let them know about obstacles
 - Never yell at a blind patient
- Deafness
 - Never assume the patient is deaf
 - If patient is wearing a hearing aid, make sure it is on
 - Determine if the patient can lip-read
 - Note writing

Domains of Comprehensive Geriatric Assessment

Medical	Social Support
Functional (physical and social)	Environmental
Cognitive	Economic Factors
Affective	Quality of life

Aging and Altered Cellular and Tissue Biology

Aging is normal, inevitable, and universal.
Accumulation of damaged macromolecules
Human lifespan is the time from birth to death.
Maximal human lifespan is 80 to 100 years.
Life expectancy is the average number of years of life remaining at a given age.
Current generation may have a shorter life span than previous generations.

Aging and Altered Cellular and Tissue Biology (cont'd)

Degenerative extracellular changes
Collagen binding and cross linking
Increase in free radicals effects on cells
Structural alterations
Peripheral vascular disease and oxidative stress

Cellular aging
Atrophy, decreased functioning, loss of cells
4977 deletion or common deletion

Aging and Altered Cellular and Tissue Biology (cont'd)

Tissue and systemic aging
Progressive stiffness and rigidity

Frailty
Complex clinical syndrome
Involves oxidative stress, dysregulation of inflammatory cytokines and hormones, malnutrition, physical inactivity, and muscle apoptosis

Aging and Distribution of Body Fluids

Total body water (cont'd)
Newborn: 75% to 90% of body weight
Childhood: 60% to 65% of body weight
Adults: 60% of body weight
Older adults: Percent declines with age
Men have a greater percentage of body water when compared with women

Aging and Mechanisms of Self Defense

Impaired or delayed inflammation is likely a result of chronic illness.

Diabetes and cardiovascular disease, among others
Medications may interfere with wound healing.

Infections are more common in older adults.

Lungs, urinary tract, and skin are often affected.

Older adults have diminished immune function.

Expression and function of several, if not all, TLRs, are decreased.

Aging and the Pulmonary System

- Loss of elastic recoil
- Stiffening of the chest wall
- Alterations in gas exchange
- Increases in flow resistance
- Alveoli tend to lose alveoli wall tissue and capillaries
- Decrease in PaO₂ and diminished ventilatory reserve, causing a decrease in exercise tolerance
- Decrease in respiratory muscle strength and endurance

Aging and the Cardiovascular System

- Cardiovascular disease
 - Most common cause of morbidity and mortality in older adults
- Physiologic changes
 - Myocardial and blood vessel stiffening
 - Changes in neurogenic control over vascular tone
 - Increased occurrence of atrial fibrillation
 - Loss of exercise capacity
 - Left ventricular hypertrophy and fibrosis

Aging and the Cardiovascular System (cont'd)

- Arterial stiffening
 - Cross-linking of collagen
 - Increased collagen
 - Changes in elastin
 - Decreased baroreceptor activity
- Improved cardiovascular health
 - Active risk reduction
 - Physical activity
 - Disease management



Aging and the Hematologic System

Blood composition changes little with age
Erythrocyte lifespan is normal, but erythrocytes are replaced more slowly

- Possible causes
- Iron depletion
 - Decreased total serum iron, iron-binding capacity, and intestinal iron absorption

Platelet adhesiveness may increase with age
Lymphocyte function decreases with age
T-cell function (cellular immunity) declines somewhat
Humoral immune system is less responsive

Aging and Renal Function

- ↓ kidney size
- ↓ RBF and GFR
- ↓ number of nephrons from renal vascular & perfusion changes
- ↓ tubular transport response
- ↓ elimination of drugs
- Increased sclerotic glomerular capillaries
- Increased excretion of glucose
- Increased bladder symptoms
 - Urgency, frequency, nocturia

Aging and the Gastrointestinal System

Tooth enamel and dentin wear down.
Teeth are lost.
Number of taste buds decline.
Sense of smell diminishes.
Sense of taste decreases.
Salivary secretion decreases.
Esophageal motility decreases.

Aging and the Gastrointestinal System (cont'd)

- ↓ gastric motility and secretions, particularly hydrochloric acid.
 - Slows gastric digestion and emptying
- ↓ intestinal motility & absorption of carbohydrates, proteins, fats, & minerals
- ↓ efficiency of drug and alcohol metabolism.
 - Related to ↓ liver perfusion & ↓ liver enzymes.

Aging and the Musculoskeletal System

- Bones
 - Loss of bone
 - Stiff, brittle, decreased strength
 - Lengthened bone remodel time
 - Slow mineralization
 - Evidence of osteoporosis
 - Increased bone resorption
- Joints
 - Cartilage: More rigid, fragile, stiff
 - Range of motion: Decreased

Aging and the Musculoskeletal System (cont'd)

- Muscles
 - Apoptosis of muscle cells
 - Sarcopenia: Age-related loss of muscles from loss of satellite cells
 - Decreased muscle strength and bulk
 - Reduced oxygen intake, basal metabolic rate, and lean body mass

Aging and the Musculoskeletal System (cont'd)

- Exercise in older adults
 - Improves muscle strength.
 - Helps increase bone mineral density.
 - Improves balance, coordination, and mobility.
 - Improves lean body mass.
 - Decreases the risk for falls.

Aging and Skin Integrity

- Integumentary system reflects changes from genetic and environmental factors
 - Becomes thinner, drier, wrinkled, and demonstrates changes in pigmentation
 - Number of capillary loops shorten and decrease
 - Melanocytes and Langerhans cells are fewer
 - Sebaceous, eccrine, and apocrine glands atrophy

Aging and Skin Integrity (cont'd)

- Other changes
 - Temperature regulation is compromised
 - Pressure and touch receptors and free nerve endings decrease in number and reduce sensory perception
 - Many of the protective functions of the skin decrease
 - Infection increases, and wound healing is delayed

Aging and the Female Reproductive System

- Menopause
 - Normal developmental event, marking the end of reproduction
 - Ceasing of menses
- Perimenopause
 - Transitional period between reproductive and nonreproductive years
- Systemic changes
 - Vasomotor flush

Aging and the Female Reproductive System (cont'd)

Ovarian Changes

Ovaries begin to decrease in size around the age of 30 years; decrease accelerates after the age of 60 years

500,000 follicles are present at the onset of puberty; the number dwindles to approximately 1000 with menopause.

Uterine Changes

Thickness of the endometrium is greater

Periods are heavier; menorrhagia (heavy bleeding) or metrorrhagia (midcycle bleeding) occur.

Aging and the Female Reproductive System

- Breast tissue changes
 - Size and firmness reduces.
- Urogenital tract changes
 - Ovaries shrink; uterus atrophies; vagina shortens, narrows, and loses some elasticity.
 - Lubrication of vagina diminishes and vaginal pH increases, creating higher incidence of vaginitis.
- Skeletal changes
 - Brittleness and porosity increases.
 - Risk for osteoporosis and fracture increases.

Aging and the Female Reproductive System (cont'd)

- Cardiac changes
 - Coronary heart disease significantly increases after menopause
- Other changes
 - Skin dryness and wrinkling increases

Aging and the Male Reproductive System

- Male reproductive capacity is longer than the woman's capacity
- No event is comparable to menopause
- Andropause describes changes with male aging
- Hypogonadism, testosterone deficiency, and proliferative disorders of the prostate gland occur
- Erectile and ejaculatory function decrease
- Testes atrophy, decrease in weight, and soften
- Levels of gonadotropins and testosterone decrease

Aging and the Endocrine System

- Endocrine changes: Consequence or cause?
- Thyroid gland
 - Glandular atrophy, fibrosis, nodularity, and increased inflammatory infiltrates, decreased TSH
- Pancreas
 - Impaired glucose tolerance and diabetes
 - Pancreatic cells replaced with fat
 - Decreased insulin secretion of the beta cells and insulin receptors
 - Increased insulin resistance

Aging and the Endocrine System (cont'd)

- Growth hormone and insulin-like growth hormone
 - Both decline with aging, called the *somatopause*; are linked to decreases in muscle size and function, fat and bone mass, and changes in reproductive and cognitive functions.
- Parathyroid glands
 - Are related to alterations in calcium balance.
 - Inadequate intake, malabsorption, or renal changes

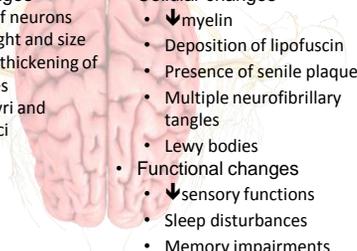
Aging and the Endocrine System

- Adrenal glands
 - ↓ clearance of cortisol is decreased
 - ↓ plasma levels of adrenal androgens gradually dramatically ↓ with age



Aging and the Nervous System

- Structural changes
 - ↓ number of neurons
 - ↓ brain weight and size
 - Fibrosis and thickening of the meninges
 - Narrowed gyri and widened sulci
 - ↑ ventricles
- Cellular changes
 - ↓ myelin
 - Deposition of lipofuscin
 - Presence of senile plaques
 - Multiple neurofibrillary tangles
 - Lewy bodies
- Functional changes
 - ↓ sensory functions
 - Sleep disturbances
 - Memory impairments





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