

AMERICAN ACADEMY OF NEUROLOGY GERIATRIC NEUROLOGY FELLOWSHIP CORE CURRICULUM

Introduction

Neurologists are called upon with increasing frequency to provide care for the elderly. As the number of elderly in our population increases, progressively larger numbers of people will develop the many acute and chronic neurological disorders associated with advanced age. In addition, antecedents for Neurologic disease in the elderly commonly begin in midlife or earlier, and primary prevention of these disorders may entail interventions prior to achieving “old age.” Through residency training, geriatric neurology fellowships and continuing medical education, the neurological community will need to master a body of knowledge concerning the special care of the elderly with neurological disorders and incorporate this information into clinical practice, education and research. To this end, Geriatric Neurology Section of the American Academy of Neurology has developed a model curriculum for geriatric neurology. This curriculum is intended to serve principally as a tool for developing fellowships in geriatric neurology. It also can serve as a guide for the integration of the geriatric neurology knowledge base and related skills into the education of medical students, residents, other fellows, and other medical and allied health care providers seeking education in this area.

Definition

Geriatric neurology focuses on neurological disorders that most often afflict the elderly. It requires understanding the effects of normal and usual aging on the nervous system, the special vulnerabilities of the aging nervous system, the disorders that frequently affect the elderly, and the methods of assessment, diagnosis, treatment and management that are often modified to adjust to this special population. The definition of “elderly” is necessarily arbitrary, but historically generally pertains to persons 65 years of age and older. As our population ages more successfully, the definition will evolve to better capture the physiologic or functionally “old.” Geriatric neurology, shares common thematic interests with several Neurologic subspecialty areas such as movement disorders, dementia, stroke, rehabilitation and neurobehavior. Development of the specialty of geriatric neurology highlights the special and often complex health and psychosocial needs of the elderly population, the characteristics of the nervous system in persons in this age group and places a priority on interdisciplinary collaboration in the field.

Training Program in Geriatric Neurology: overview

The number of persons in the United States over the age of 65 is expected to double in the next 50 years, with those over the age of 85 comprising the most rapidly growing group. The good news is that some neurological diseases in the elderly can be modified through diet, exercise, cessation of smoking, and management of hypertension and other medical disorders, even late in life. In the absence of other modifiable risk factors and preventative or ameliorative therapy, particularly with respect to the neurodegenerative diseases, it is anticipated that the number of persons with age-related neurological conditions will increase greatly during this time. The current limitations in effective medication for many of these neurological conditions should not obscure the important interventions that can appreciably improve the quality of life for both the patient and the caregiver. Maximizing success in these areas requires specialized clinical expertise in geriatric neurology, the ability to work effectively with many other medical and non-medical health care providers and an understanding of research regarding the clinical and scientific basis of aging and age-related neurological dysfunction.

The overall objective for specialty training in geriatric neurology is to provide the knowledge, skills and

attitudes most conducive to meet the following goals:

1. Provide high quality clinical care suited to the special needs of the elderly with neurological disorders, including screening, diagnostic and functional evaluation, treatment, management, supportive counseling and psycho-social intervention;
2. Work effectively with multidisciplinary teams oriented to the care of the elderly; and
3. Become leaders in academic/research careers.

Goal 1: Provide High Quality Clinical Care Suited to the Special Needs of the Elderly

A training program to equip potential geriatric neurologists with the capacity to deliver high quality clinical care to the elderly suffering from neurological conditions must have available the following:

The fellowship must provide the geriatric neurologist in training with knowledge and skill consistent with high-quality clinical care. The educational program must be organized to provide sufficient clinical, educational, investigative and administrative experience to produce an excellent clinician/teacher/investigator in the field. The program should emphasize the scientific basis of aging, clinical assessment of elderly persons, common neurological disorders of the elderly, the manner of presentation of these disorders in aged persons and the special vulnerabilities of the aging nervous system. The program should address the rationale for providing multidisciplinary and interdisciplinary care and the methods of providing care with these types of approaches, the use of laboratory studies in the evaluation of elderly persons with neurological complaints and the methods to diagnose, treat, manage and provide a continuum of care for the elderly with neurological disorders. These topics should be taught in a formal didactic program to ensure that they are properly communicated. The fellowship should also provide the trainee with the skills needed to pursue research in this field.

Through supervised experience, the trainee must acquire a working knowledge of the principles of geriatric care and specific neurological disorders commonly seen in the elderly. Clinical experiences for the trainee must include the opportunity to examine, diagnose, treat and manage elderly patients with a wide variety of neurologic disturbances as, principal care provider and consultant. There should be a clinical focus on functional evaluation, treatment, management, counseling and social intervention for elderly persons with acute and chronic neurological disorders. The training program should include the opportunity to manage patients over extended periods to observe the progress of neurological disorders within single patients. The topics concerning aging relevant to geriatric neurology and the common neurological disorders afflicting the aged are listed in the “core content” section.

Goal 2: Work Effectively with Multidisciplinary Team Oriented to the Care of the Elderly

Care of the elderly with neurological disorders often requires the cooperative interactions of professionals representing various areas of health care. A fellowship in geriatric neurology should provide an educational experience that will equip the trainee with the capacity to recognize the diverse skills needed for comprehensive care of the elderly with neurological disorders and the ability to work in collaboration with interdisciplinary and multidisciplinary teams. The trainee should have experience as a team leader and as a team member or consultant. The fellow should participate in the functioning of the interdisciplinary team, through close working relationships with the medical and non-medical health care providers. This experience is necessary to foster a comprehensive understanding of the geriatric patient, who is often beset with multiple neurological and non-neurological symptoms, diagnoses and treatments.

Goal 3: Become leaders in Academic/Research Careers

The fellowship should provide adequate time, resources and opportunities for the fellow to develop the research skills necessary to pursue an independent academic career. The faculty must be actively involved in research relevant to Geriatric Neurology, and have demonstrated the ability to obtain funding competitively, perform scientifically credible research whose results are published in peer reviewed journals. There should be ample teaching opportunities for the fellow.

CORE CONTENT OF GERIATRIC NEUROLOGY

The topics listed below provide an outline of a core curriculum in Geriatric Neurology for fellowship training. Many of the topics included can be used for educational programs in Geriatric Neurology for medical students, neurology residents, academic neurologists and neurologists in practice.

SECTION 1: GENERAL CONCEPTS

1. THE SCIENTIFIC BASIS OF AGING

A. METHODOLOGICAL ISSUES

- (1) "Normal" aging
- (2) Cross-sectional vs. longitudinal study design
- (3) Prospective vs. retrospective study design
- (4) Randomized, case control, convenience samples
- (5) Quantitative, semi-quantitative, qualitative measures
- (6) Peak ("successful") vs. average ("usual") aging
- (7) Separation of subjects with neurological/cognitive disease from controls
- (8) Concept of "reserve" and homeostasis
- (9) Increased heterogeneity in population with aging
- (10) Influence of prevention, maintenance, reversal
- (11) Impact of policy, politics and finances

B. BIOLOGICAL THEORIES OF AGING

- (1) Genetic theories
- (2) Cross-linkage theory
- (3) Free-radical theory
- (4) Pacemaker and immunologic theory

C. AGE-RELATED CHANGES IN THE NERVOUS SYSTEM

- (1) Neuroanatomical
- (2) Neurophysiological
- (3) Neurochemical

D. EFFECTS OF MEDICATIONS

- (1) General principles of prescribing in the elderly
- (2) Alterations in absorption, distribution, metabolism and excretion
- (3) Large number and wide variety of drugs causing confusion
- (4) Classification of medications commonly used in the elderly

E. AGE-RELATED CHANGES AND FUNCTIONAL CAPACITY

- (1) Cognition, including memory, language, executive functions and other domains
- (2) Mood and Behavior
- (3) Motor function
- (4) Somatosensory function
- (5) Audition
- (6) Vision
- (7) Olfaction and taste

SECTION 2: CLINICAL ISSUES

1. CLINICAL ASSESSMENT

A. CLINICAL CHANGES COMMON WITH AGING

- (1) Factors associated with "usual" aging in the nervous system
 - (a) Neuronal attrition
 - (b) Cumulative effects of minor neuronal injury
 - (c) Diminished capacity to compensate for damage (plasticity)
 - (d) Marked individual variations in changes
 - (e) Magnified genetic differences over time
 - (f) Environmental influences
 - (g) Differential aging processes in individual tissues and organs
 - (h) Differences in aging processes between men and women
- (2) Cognitive, Behavioral and functional consequences of aging in the nervous system
 - (a) Changes in memory
 - (b) Alterations of language function
 - (c) Visual-perceptual changes
 - (d) Slowing of reaction time
 - (e) Diminished strength
 - (f) Decreased balance and coordination
 - (g) Limited endurance

B. DISEASES WITH UNIQUE OR ATYPICAL PRESENTATIONS

- (1) Difficulties in differentiating normal changes from disease
- (2) Effects of differences in neuroanatomy, neurophysiology, neurochemistry and homeostasis with aging
- (3) Results of multiple concurrent pathologies (co morbidity) and/or medications
- (4) Frequent absence of classical symptoms of common diseases presentation
- (5) Influence of age upon disease presentation and severity of disease at presentation
- (6) Different etiologies of illnesses in the elderly than in younger groups
- (7) Different significance of symptoms and signs of illness in elderly (e.g.: Delirium, incontinence, gait instability and falls are often nonspecific responses to systemic insults)
- (8) Consequences of changes in functional performance with aging
- (9) Many illnesses manifested only with impaired functional ability
- (10) Importance of behavioral and sociological factors
- (11) Slower recovery to appropriate treatments

- (12) Frequent co-morbid conditions
- (13) Common Neurologic “Geriatric Syndromes”
 - (a) Delirium or confusional states
 - (b) Incontinence
 - (c) Gait instability and Falls

C. MEDICATION ISSUES

- (1) Additive effects of medications on the central nervous system
- (2) Poor compliance with complicated medication schedules
- (3) Greater susceptibility to the side effects of medications
- (4) More frequent need for periodic review of medications, doses, frequencies, levels
- (5) Greater need for primary/principal care to coordinate medications

D. GERIATRIC SCREENING & ASSESSMENT IN MULTIPLE DOMAINS (MEDICAL, COGNITIVE, FUNCTIONAL, PSYCHOSOCIAL)

- (1) Purpose of screening
 - (a) Early detection
 - (b) Focus on prevention
- (2) Purposes of assessment
 - (a) Improve diagnostic accuracy
 - (b) Guide the choice of interventions to maximize function
 - (c) Recommend an optimal environment
 - (d) Predict outcomes
 - (e) Monitor clinical changes over time
- (3) Elements of assessment
 - (a) Physical health
 - (b) Medication review (prescription and over-the-counter)
 - (c) Cognitive status
 - (d) Mental health
 - (e) Functional status
 - (f) Environmental characteristics
 - (g) Social and economic status
 - (h) Ethical and legal issues

2. EVALUATION OF COGNITION

A. VARIABLES THAT INFLUENCE COGNITION AND COGNITIVE ASSESSMENT

- (1) Age, gender, education and cultural norms
- (2) Level of intellectual activity (past and present)
- (3) Continued involvement in profession, community, family and hobbies
- (4) Anxiety, depression, hostility
- (5) Fatigue
- (6) Deleterious effects of separation, isolation and loss
- (7) Degree of family involvement and support (positive or negative effects of closeness of family)
- (8) Effects of non-neurological illnesses and medications

- (9) Premorbid psychiatric disorders
- (10) Capacity of the patient to recall and relay the history
- (11) Importance of collaborative history from objective observers

B. NEUROPSYCHOLOGICAL ASSESSMENT

- (1) Purposes
 - (a.) Identify at risk, pre-diagnostic levels of impairment
 - (b) Clarify Diagnosis/localization
 - (c) Determine staging and prognosis
 - (d) Identify strengths and weaknesses
 - (e) Support competency assessment
 - (f) Direct therapeutic intervention
 - (g) Monitor change
- (2) Methodological concerns
 - (a) Extremes of education/Intelligence
 - (b) Cross cultural limitations
 - (c) Fatigue
 - (d) Inappropriate interpretation of results
- (3) Domains of interest
 - (a) Intelligence
 - (b) Attention: sustained, selective
 - (c) Memory: immediate, delayed (new learning), remote
 - (d) Executive functions, judgment and motor programming
 - (e) Language
 - (f) Praxis
 - (g) Visuospatial/ visuoconstructive abilities including neglect or extinction
 - (h) Mood/affect/behavior
 - (i) Motor speed/complex reaction time
- (4) Commonly used neuropsychological tests
 - (a) Overall Intelligence assessment: Wechsler Adult Intelligence Scale (WAIS) Peabody Picture Vocabulary Test
 - (b) Attention/immediate recall: Digit span
 - (c) Memory evaluation: Wechsler Memory Scale)
 - (d) Executive function: Wisconsin Card Sorting Test, Stroop Color-Word Test, Trail Making Tests, Halstead Categories Test, Verbal Fluency
 - (e) Language: Wide Range Achievement Test (WRAT) Western Aphasia Battery, Boston Diagnostic Aphasia Examination, Boston Naming Test, Token Test
 - (f) Visuospatial/ Visuoconstructive skills: Hooper, Benton Gestalt, Clock Face, Cube Copy, Cross Out Test, Rey-Osterrieth Complex Figure, WAIS block design
 - (g) Mood/affect: Geriatric Depression Scale, Self-Rating Scale Symptom Check List, CES-D, Hamilton, Beck, Neuropsychiatric inventory
 - (h) Psycho-Motor function, speed, complex reaction time: Finger Tapping, Grip Strength, Purdue Pegboard, Simple Reaction Time, Complex/Choice Reaction Time
- (5) Commonly used screening tests for dementia
 - (a) Mini-mental State examination
 - (b) Mattis Dementia Scale
 - (c) Blessed Orientation-Memory-Concentration Test
 - (d) Mental Status Questionnaire

- (e) Short Portable Mental Status Questionnaire
 - (f) Alzheimer's Disease Assessment Scale (ADAS)
- (6) Commonly used batteries for dementia
 - (a) Consortium to Establish a Registry for Alzheimer's Disease (CERAD)
 - (b) ADAS-cog (widely used in drug trials with longitudinal measures of change)
 - (c) Neuropsychiatric Inventory
 - (7) Commonly used staging instruments
 - (a) Global Deterioration Scale (GDS)
 - (b) Clinical Dementia Rating scale (CDR)

C. SPEECH, LANGUAGE AND COMMUNICATION CHANGES

- (1) Speech changes in usual aging pitch, loudness, stability of tone
- (2) Language changes in usual aging
 - (a) Relationship of language to other cognitive systems
 - (b) Relationship of language to auditory system pathology
 - (c) Stability of vocabulary
 - (d) Word finding problems
- (3) Disorders of language: Aphasia
 - (a) Definition
 - (b) Classification
 - (c) Localization
 - (d) Etiologies
 - (e) Evaluation
 - (f) Test methods
 - (g) Therapeutic/management approaches
- (4) Speech and language changes in Alzheimer's disease
 - (a) Commonly observed changes
 - (b) Correlation of speech/language impairment with severity of dementia
- (6) Speech-changes associated with neurologic disease: Dementia and other Neuro-degenerative disorders
- (7) Changes in expression and recognition of affect in tone, face and gesture increase susceptibility to deceit

D. INCIDENCE & PREVALENCE OF DEMENTIA INCREASE WITH AGE

- (1) Definition/Diagnostic criteria
- (2) Early detection criteria for Mild Cognitive Impairment
- (3) Alzheimer's disease
 - (a) Epidemiology
 - (b) Theories of etiology
 - (c) Theories of pathogenesis
 - (d) Genetics

- (e) Pathology: macroscopic, microscopic, neurochemical
 - (f) Clinical evaluation
 - (g) Imaging studies
 - (h) Clinical course
 - (i) Management
 - (j) Experimental treatment
- (4) Other common adult dementias
- (a) Vascular dementias, including "multi-infarct dementia"
 - (b) Parkinson's disease with dementia
 - (c) Diffuse Lewy body disease and variants
 - (d) Cortico-basal degeneration
 - (e) Progressive Supranuclear Palsy
 - (f) Multiple system atrophy
 - (g) Normal pressure hydrocephalus
 - (h) "Alcoholic" and nutritional dementias
 - (i) Dementia of Multiple Sclerosis
 - (j) Combined system disease with dementia
 - (k) Frontotemporal dementia and Pick's disease
 - (l) Huntington's disease
 - (m) Creutzfeldt-Jakob disease (spongiform encephalopathy)
 - (n) Myxedema with dementia
 - (o) Dementia associated with acquired immunodeficiency syndrome (AIDS dementia)
 - (p) Brain tumor
 - (q) Depression and other psychiatric disorders: sometimes referred to as "Pseudodementia"
 - (r) Dementia associated with repeated head trauma (dementia pugilistica)
 - (s) Dementia associated with subdural hematoma
 - (t) Post-anoxic/Post CABG
 - (u) Delayed effects of brain radiation therapy
- (5) Medical, functional, and social management of dementia
- (a) Etiology-specific treatment
 - (b) Function-specific management: gait instability, sleep disturbances, incontinence
 - (c) Behavioral management: agitation, withdrawal, wandering, hallucinations
 - (d) Interactions with family members/caregivers
 - (e) Legal issues: Advocacy, Power of attorney, Advance Directives, Guardianship/Competency, ability to continue to work
 - (f) Driving, guns, heavy equipment, living alone and other safety issues
 - (g) Community resources
 - (h) Importance of respite and palliative care

3 PSYCHIATRIC AND NEUROPSYCHIATRIC DISORDERS

A. PSYCHOSOCIAL, SOCIOCULTURAL AND PSYCHOLOGICAL ASPECTS OF AGING IMPACT BEHAVIORAL DISORDERS

B. PSYCHIATRIC DISORDERS ARE COMMON

- (1) Epidemiology: Prevalence, Incidence, Sex ratio
- (2) Risk factors

C. PSYCHIATRIC EVALUATION

- (1) Psychiatric history/ Interviewing techniques
- (2) Psychiatric mental status examination, including neuropsychiatric examination

D. CATEGORIES OF PSYCHIATRIC DISORDERS IN THE ELDERLY

- (1) Organic mental disorders
 - (a) Psychiatric aspects of dementia
 - (b) Delirium
 - (c) Organic and substance-related hallucinations
 - (d) Delusional states
 - (e) Mood disorders associated with medical/neurological disorders
- (2) Mood disorders
 - (a) Major depression and other depressive syndromes
 - (b) Bipolar disorder
- (3) Psychotic disorders
 - (a) Schizophrenia
 - (b) Schizophreniform disorders
 - (c) Paranoid (delusional) disorders
 - (d) Organic hallucinosis
- (4) Alcohol and drug abuse/dependence
 - (a) Psychopharmacology
 - (b) Effects of drugs commonly used in the elderly
- (5) Anxiety disorders
- (6) Adjustment disorders
- (7) Sleep disorders
- (8) Sexual dysfunction/disorders
- (9) Personality disorders

E. TREATMENT OF PSYCHIATRIC DISORDERS

- (1) Psychopharmacology
- (2) Electroconvulsive therapy
- (3) Psychotherapy
- (4) Family issues in therapy

4. MOTOR FUNCTION

A. FEATURES OF MOTOR FUNCTION THAT INFLUENCE PERFORMANCE

- (1) Speed
- (2) Strength
- (3) Endurance
- (4) Balance and coordination

- (5) Spontaneous motor activity
- (6) Motor learning; role of task complexity
- (7) Influence of training

B. ANATOMIC UNITS OF MOTOR FUNCTION

- (1) Peripheral nervous system: Muscle, Neuromuscular junction, Motor nerve/motor roots
- (2) Central nervous system
 - (a) Spinal cord - motor neurons/tracts
 - (b) Brainstem - motor neurons/tracts
 - (c) Cerebellum
 - (d) Basal ganglia
 - (e) Thalamus
 - (f) Deep white matter
 - (g) Cerebral cortex: Primary motor, Supplementary motor, Premotor

C. MOTOR CHANGES IN USUAL AGING

- (1) Decreased speed of movement
- (2) Subtle decline in strength and endurance
- (3) Changes in balance and coordination
- (4) "Minor" extrapyramidal signs
 - (a) Flexed posture
 - (b) Gait characteristics
 - (c) Stride length

D. COMMON MOTOR-PATHOLOGICAL CONDITIONS

- (1) Myopathy: Senile muscle atrophy of uncertain etiology, Polymyositis
- (2) Myasthenia gravis
- (3) Motor neuropathy/radiculopathy
- (4) Myelopathy
- (5) Amyotrophic lateral sclerosis
- (6) Strokes
- (7) Normal pressure hydrocephalus
- (8) Subdural hematoma
- (9) Movement disorders

E. MOVEMENT DISORDERS

- (1) Parkinson's disease
- (2) Parkinsons plus disorders (PSP, Multi-system atrophy, Lewy Body Dementia, Cortico-basal degeneration)
- (3) Stiff-person syndrome
- (4) Tremors: Resting, Postural, Action, Intention, Rubral)
- (5) Dystonia
- (6) Tardive Dyskinesia
- (7) Myoclonus
- (8) Tics

- (9) Blepharospasm
- (10)Chorea, Athetosis/ Huntington's disease
- (11)Akathesia
- (12)Restless leg syndrome
- (13)"Senile" gait

5. SPECIAL SENSORY, SOMATOSENSORY AND AUTONOMIC FUNCTION

A. VISUAL IMPAIRMENT

- (1) Anatomical and physiological changes with aging
 - (a) Decreased pupil size and reactivity
 - (b) Diminished lens elasticity
 - (c) Reduced clarity of lens
 - (d) Decline in numbers of rods and cones
- (2) Functional changes associated with usual aging
 - (a) Decreased light perception
 - (b) Diminished static and dynamic visual acuity
 - (c) Reduced near vision (presbyopia)
 - (d) Decline in size of visual fields
 - (e) Limited contrast sensitivity and color vision
 - (f) Decreased light/dark adaptation
 - (g) Poor glare recovery
- (3) Commonly encountered diseases
 - (a) Cataracts
 - (b) Retinopathy: Diabetic, Hypertensive, Retinitis pigmentosa
 - (c) Macular degeneration
 - (d) Glaucoma
 - (e) Tumors or strokes affecting the visual pathways
- (4) Tests
- (5) Treatment/management

B. AUDITORY DYSFUNCTION AND COMMUNICATION

- (1) Anatomical and physiological changes with aging
- (2) Functional changes with aging
 - (a) Decreased pure tone hearing (Presbycusis)
 - (b) Diminished speech discrimination
 - (c) Increased recruitment
- (3) Commonly encountered types of disorders
 - (a) Conduction hearing loss
 - (b) Sensory neural hearing loss
- (4) Tests
- (5) Treatment/management

C. DECLINE OF TASTE AND SMELL IMPACT QUALITY OF LIFE

- (1) Anatomical, physiological, and functional changes with aging
- (2) Commonly encountered disorders
- (3) Tests
- (4) Treatment/management

D. SOMESTHETIC SENSORY DEFICITS

- (1) Anatomical and physiological changes with aging
- (2) Functional changes with aging
 - (a) Decline of vibratory sensation in lower extremities
 - (b) Abnormalities in joint position sense
- (3) Commonly encountered diseases
- (4) Tests
- (5) Treatment/management

E. AUTONOMIC DYSFUNCTION

- (1) Anatomical and physiological changes with aging
- (2) Functional changes common in the elderly
 - (a) Decreased pupillary reflexes
 - (b) Orthostatic hypotension
 - (c) Urinary dysfunction
 - (d) Sexual dysfunction
- (3) Other causes of autonomic dysfunction in the elderly
 - (a) Medications
 - (b) Bed rest
 - (c) Volume depletion
 - (d) Diabetes
 - (e) Multiple system atrophy (Shy-Drager syndrome, sporadic olivopontocerebellar atrophy with autonomic changes)
 - (f) Systemic amyloidosis
- (4) Tests
- (5) Treatment/management

F. MULTIPLE SENSORY DEFICITS

- (1) Gait disturbances/falls
- (2) Apparent cognitive decline
- (3) Psychiatric disorders (depression/paranoia/hallucinations)

G. DIZZINESS AND VERTIGO

- (1) Definition: true vertigo vs. disequilibrium vs. light headedness
- (2) Common etiologies: Medication, Vestibular disorders, Migraine equivalent events, Cerebrovascular disorders
- (3) Diagnostic tests
- (4) Treatment/management: Treat underlying cause, Desensitization, Symptomatic medications

H. SYNCOPE

- (1) Increased incidence with age
- (2) Etiology
- (3) Diagnostic tests
- (4) Treatment/management

I. PAIN SYNDROMES AND IMPACT ON MOOD, AFFECT, QUALITY OF LIFE

- (1) Common etiologies
 - (a) Arthritic-pain: Degenerative joint disease, Rheumatoid arthritis, Gouty arthritis, Temporal mandibular joint disease
 - (b) Muscular/fibrous pain: Myositis, Fibromyalgia
 - (c) Neuralgic pain: Post-herpetic neuralgia, Radiculopathies, Painful diabetic neuropathy, Trigeminal neuralgia
 - (d) Vascular: Migraine, Temporal arteritis
 - (e) Thalamic stroke
- (2) Tests
- (3) Treatment/management

6. OTHER COMMON NEUROLOGICAL DISORDERS OF THE ELDERLY

A. CEREBROVASCULAR DISEASE

- (1) Epidemiology/incidence
 - (a) Age-related incidence
 - (b) Declining incidence in recent years
 - (c) Race/sex differences (intracranial vs. extracranial)
 - (e) Risk factors
- (2) Etiologies
 - (a) Thrombotic cerebrovascular disease
 - (b) Embolic cerebrovascular disease
 - (c) Cerebral hemorrhage
- (3) Stroke Presentations
 - (a) Transient ischemic attacks and Reversible ischemic neurological disorders
 - (b) Completed stroke
 - (c) Specific stroke syndromes
- (4) Treatment/management
 - (a) Complications of stroke
 - (b) Immediate

- (c) Long-term
- (d) Current treatment
- (e) Complications of treatment
- (f) Experimental treatment
- (g) Rehabilitation

(5) Prevention

B. SUBSTANCE ABUSE AND UNEXPLAINED FUNCTIONAL IMPAIRMENT

- (1) Definition
- (2) Epidemiology
- (3) Characteristics and detection of elderly substance abusers
- (4) Consequences of substance abuse
- (5) Treatment/management

C. TRAUMA AND ABUSE

- (1) Epidemiology of trauma in the elderly
 - (a) Incidence
 - (b) Etiology: Falls, Motor Vehicle Crashes, Physical abuse
 - (c) Preventive measures
- (2) Neurological consequences of trauma
 - (a) Craniocerebral injury
 - (b) Spinal injury
 - (c) Root/nerve injury
 - (d) Long bone fracture
- (3) Abuse (Physical and mental)
 - (a) Recognizing the abused elderly
 - (b) Types of abuse
 - (c) Consequences of abuse
 - (d) Treatment/management
 - (e) Prevention

D. NEOPLASMS WITH AGE-RELATED INCREASE IN INCIDENCE

- (1) Incidence
- (2) Types of disorders
 - (a) Primary central nervous system neoplasms
 - (b) Metastatic disease
 - (c) Paraneoplastic diseases
- (3) Clinical presentation
- (4) Diagnostic evaluation
- (5) Treatment/management
- (6) Complications of treatment

E. INFECTIOUS DISEASES AFFECTING THE NERVOUS SYSTEM

- (1) Neurological effects of systemic infections
- (2) Central nervous system infections

F. PAROXYSMAL DISORDERS

- (1) Seizure disorders
- (2) Syncope
- (3) Transient ischemic attacks
- (4) Migraine headaches or equivalents
- (5) Trigeminal neuralgia

G. METABOLIC AND SYSTEMIC DISEASES WITH NEUROLOGICAL MANIFESTATIONS

- (1) Endocrinological disorders
- (2) Renal diseases
- (3) Hepatic disorders
- (4) Cardiac diseases
- (5) Pulmonary diseases
- (6) Hematological and bone disorders
- (7) Gastrointestinal and deficiency diseases

7. SPECIAL STUDIES

A. ELECTROMYOGRAPHY

B. ELECTROENCEPHALOGRAPHY

C. EVOKED POTENTIAL LATENCIES

D. TESTS OF AUTONOMIC NERVOUS SYSTEM FUNCTION

E. NEUROIMAGING INSIGHTS INTO ANATOMY, PHYSIOLOGY AND BIOCHEMISTRY OF THE NERVOUS SYSTEM

8. TREATMENT AND MANAGEMENT ISSUES

A. WELLNESS AND PREVENTION

- (1) Exercise and fitness
- (2) Nutrition
- (3) Immunization
- (4) Blood pressure control
- (5) Medication use, dose and/or duration
- (6) Screening (cognitive, functional, sensory) for disease
- (7) Exposure to risk factors

- (8) Support systems
- (9) Home visit to review safety issues and maximize function
- (10) Transportation options

B. COMPLEX ISSUES IN MANAGING ILLNESSES IN THE ELDERLY

- (1) Medications for prophylaxis
- (2) Treatment of underlying conditions
- (3) Reversing the reversible
- (4) Setting realistic goals for therapy with patient and caregivers
- (5) Responses to surgery, including neurosurgery
- (6) Living situation options: home, congregate living, nursing home
- (7) Role of the family and caregiver
- (8) Addressing task specific competence
- (9) Rehabilitation
- (10) Adaptation to functional environment
- (11) Behavioral management
- (12) Pharmacologic issues
- (13) Polypharmacy (monitoring for drug interactions)
- (14) Experimental treatments
- (15) Patient and family education
- (16) Follow-up
- (17) Decision analysis
- (18) Health policy, insurance and cost

9. INTERDISCIPLINARY ISSUES

A. MULTIDISCIPLINARY AND INTERDISCIPLINARY APPROACHES MAXIMIZE SUCCESS IN MANAGEMENT

- (1) Multidisciplinary team members and functions
- (2) Functional assessment with activities of daily living (ADL) and instrumental activities of daily living (IADL) instruments
- (3) Rehabilitation
- (4) Psychosocial support systems

B. COMPETENCY AND DECISION MAKING

- (1) Advance directives
- (2) Living wills
- (3) Do not resuscitate (DNR)/do not treat
- (4) Role of ethics committees
- (5) Driving, Working, Living alone
- (6) Research issues

C. SOCIETAL ISSUES

- (1) Epidemiology
- (2) Clinical protocols
- (3) Outcome assessment

- (4) Quality of life
- (5) Entitlement
- (6) Services
 - (a) Inpatient hospital
 - (b) Outpatient physician/allied health personnel providers
 - (c) Continuum of care: Home care, Day care, Institutional care
- (7) Financial issues
 - (a) Relative value scale
 - (b) Costs of care of individual to society
 - (c) Impact of diagnostic related groups (DRGs, capitation, HMOs)
- (8) Legal and political issues
- (9) Community and family support services and programs
- (10) Advocacy and lay organizations

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