

UNITED COUNCIL
FOR
NEUROLOGIC
SUBSPECIALTIES

**Headache Medicine
Core Curriculum**

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1. Traditional Curriculum Components

A. Definition of the Subspecialty

1. Headache Medicine is a subspecialty concerned with the diagnosis and treatment of head and face pain. Its scope includes the diseases or categories of disease causing central and peripheral disturbance of structures or functions causing head and face pain and includes both primary and secondary disturbances of these structures or functions. Consequently, affected patients may present for clinical care in multiple specialty areas including primary care, such as family practice, general internal medicine, and specialty care, including, but not restricted to neurology, neurosurgery, otolaryngology, physical medicine and rehabilitation, oromaxillofacial surgery and psychiatry.

B. Program Content

1. At the completion of the program, the trainee must demonstrate the ability to:
 - a. Perform the following elements of the ideal encounter with a headache patient:
 - 1) History
 - 2) Physical
 - 3) Diagnostic formulation
 - 4) Patient education
 - 5) Prognostic determination
 - 6) Treatment plan
 - b. Procedural skills
 - 1) Lumbar puncture
 - a) Diagnostic
 - b) Therapeutic
 - 2) Trigger point injections
 - 3) Occipital nerve blocks
 - 4) Chemodenervation
 - c. Provide compassionate care
 - d. Understand the role of the consultant
 - e. Establish and maintain a Headache Center
 - 1) Outcomes
 - 2) Quality Improvement
 - 3) Disease management
 - 4) Information technology
 - 5) Database management
 - f. Be an integral part in the teaching of Headache Medicine to trainees, medical students and other health-care professionals
2. The training in Headache Medicine must provide the opportunity for active trainee participation in research projects pertinent to Headache Medicine. This should include instruction in the conduct of scholarly activities, in the critical evaluation of methods and interpretation of data including clinical trial design
3. Conferences must be organized, held, and attended regularly. The faculty will encourage the trainee to actively seek inclusion in institutional grand rounds, multidisciplinary conferences and departmental trainee teaching seminars

4. Content Areas
 - a. Epidemiology and Comorbidity
 - b. Anatomy and Physiology
 - c. Headache Classification and Diagnosis
 - d. Evaluation and Diagnostic Testing
 - e. Treatment

C. Goals

1. The first goal of any educational program and its component parts is to provide the advanced knowledge required for best practice of headache medicine. This goal can only be met when competent mentors advise the trainee by guided learning and by actively challenging their intellectual capabilities. Domains of behavior as defined by the core competencies are addressed in the *Headache Medicine Fellowship Program Requirements*. Domains of knowledge must include:
 - a. Clinical Practice
 - b. Teaching
 - c. Clinical Science
 - d. Basic Science
2. In each domain, published knowledge is available to train practitioners and to introduce the concepts necessary for further study in any of the designated areas for the purpose of creating practitioners, clinician scientists and researchers. The primary goal of this enterprise is to improve the care of all headache patients.
3. A secondary, but no lesser goal is to be able to evaluate and document the progress of the trainee. This should be accomplished by:
 - a. Direct observation of clinical skills and decision making.
 - b. Documentation will include skills evaluations completed and placed in the trainees file at quarterly intervals.
 - c. House Staff and medical students will be encouraged to evaluate the teaching abilities of the trainee. Written evaluations, where available, should be placed in the trainee's file.
 - d. Clinical science is best documented by publication. Individual fellows will be encouraged to generate clinical scientific reports. These reports could be used to support the strength of the Program.
 - e. Demonstration of the ability to synthesize and generate basic science information and understanding should be incorporated into the evaluation of the trainee as a part of the written record.

D. Objectives for Trainees

1. *Clinical and Research Objectives:* The specific skills or changes in behavior which trainees should be able to demonstrate upon completion of the program include the following: a headache specialist should be able to care for routine and complex headache patients of all types and should be competent to design research studies capable of advancing basic knowledge and quality improvements in the area of patient care.
2. *Teaching Objectives:* The ability to teach others the scope of necessary knowledge appropriate for their area of family practice, internal medicine, etc. follow upon the attainment of the above skills and changes in behavior. These functions, taken together, are fundamental to the perceived need of a Neurologic Subspecialty Area (NSA) in Headache Medicine.

E. Methods of Training to be Used

1. Training will occur in the facilities of the training institution. In the absence of a subspecialty headache clinic, the trainee will work in close physical association with the program director and/or mentor. Training activities should include didactic, clinical methodological, and research techniques including clinical trials.
2. General requirements:

At least 80% of the time should be spent in supervised outpatient and inpatient care.

 - a. In-patient admissions and consultations
 - 1) If not available at the primary institution, inpatient headache care should be available by preceptorship.
 - b. Ambulatory care requirements
 - 1) A variety of patients from diverse demographic segments should be available.
 - 2) The presence of full-time clinics in neurology (for non-neurologist trainees) dental/oral surgery, otolaryngology, neurosurgery, ophthalmology, general medicine and family practice is recommended to insure that the full diagnostic spectrum of headache types will be represented.
 - a) Elective time in these clinical areas must be provided. Percentage time in these clinical areas must be determined on the basis of the primary subspecialty of the program or medical director and the needs of the new graduate from residency.
 - c. Preferred availability of multi-disciplinary teams
 - 1) Ideally this offers the best opportunity for training, especially for psychological assessment and management of facial pain and headache as a chronic pain disorder
 - d. Affiliations
 - 1) Recognized expertise in headache medicine outside of the primary, academic institution should be utilized in order to provide instruction in clinic development and practice management
3. Documenting the experience
 - a. This will consist of a paper record of types of patients and diagnoses seen.
 - b. The program director will be responsible for recording and reporting the completion of program requirements for the individual trainee.

F. Methods of Evaluation for Individual Programs

1. Program success will be measured by both internal and external metrics. These should include, but not be limited to:
 - a. Board certification of trainees in their primary specialty.
 - b. Pass rate on subspecialty examination.
 - c. Contributions to general knowledge in the disease management area.
 - d. Recognition by the ruling bodies of the UCNS, AHS, and specialty associations of origin for non-neurologists.
 - e. National recognition of mentors.
 - f. Fulfillment of dynamically defined, competency based evaluations using on-site and off-site evaluation teams including regular review by UCNS and UCNS Accreditation Council where appropriate

G. Methods of Feedback for Individual and Collective Programs

1. Feedback will be provided by internal review from departmental and institutional sources to include the depth of commitment of the institution of origin using standard metrics from other recognized specialties (space, faculty development, financial support and research time).
2. Standard channels for external feedback as defined by the UCNS and the UCNS Accreditation Council. On and offsite review will be used for continuous quality improvement.

2. Core Curriculum for Trainee in Headache Medicine

The format of the *Headache Medicine Core Curriculum* will follow the *Content Outline of the Headache Medicine Written Examination*. This is done to provide clarity and organization to the material. Individuals and programs should expand these content areas to suit the needs of the trainee.

The *Headache Medicine Core Curriculum* should adequately address the following core concepts:

- The mechanism of migraine and the applicability of this mechanism to acquired headache.
- The pathophysiology of the recognized subtypes of head pain including cluster headache, trigeminal neuralgia and tension type headache.
- The classification of headache including the International Headache Society Classification.
- The neuroanatomy, neurophysiology and neurochemistry of the processes underlying head pain syndromes and associated problems including comorbidity, neuropsychiatry and cerebral vascular disease.
- The adequate teaching of Headache Medicine requires extensive knowledge of the epidemiology, economic and pharmacology of migraine and the other headaches.
- Secondary or symptomatic headache will present either with unique features and associations. Symptoms and signs typical of the underlying disorder can frequently help in their diagnosis. A headache specialist must be facile in the diagnosis of these illnesses.

3. Content of Subjects to be Taught

I. Epidemiology and Comorbidity

A. Epidemiologic Principles

1. Headache
 - a) Primary
 - b) Secondary
2. Migraine
 - a) Prevalence and incidence
 - 1) USA
 - 2) International
 - b) Demography including gender and ethnic/racial difference
 - c) Genetics
 - 1) CADASIL
 - 2) Familial hemiplegic migraine
 - 3) Migraine with aura
 - d) Burden of disease
 - 1) Economic impact
 - e) Pharmacoeconomics

B. Comorbidities of Migraine

1. Neurologic
 - a) Stroke including CADASIL
 - b) Sleep
2. Psychiatric
 - a) Depression
 - b) Anxiety
3. Other

II. Anatomy and Physiology

A. Pain Mechanisms

1. Peripheral and central trigeminal pain physiology and anatomy
 - a) Trigeminal nerve including ganglia and trigeminovascular connections
 - 1) central processing of nociceptive signaling from the trigeminal nucleus caudalis (TNC)
 - b) Central processing of head and face pain via the ventral thalamus, and somatosensory cortex
2. Nociceptive neurotransmission
 - a) Common conditions associated with dysfunction in the peripheral branches of the trigeminal system including cutaneous nociception, muscular, osseous/and extradural sources (sinuses and teeth), and dural structures including blood vessels
 - b) Mechanisms of trigeminal neuropathy including, but not limited to, myofascial pain of the face and head
 - c) Evaluations of neural transmission used in headache medicine
 - 1) Exteroceptive temporalis muscle auppersion
 - 2) Visual Evoked Potentials (VEP)
 - 3) Brainstem Auditory Evoked Responses (BAER)
3. Peripheral and central sensitization
 - a) Cutaneous allodynia and migraine (Burstein)
4. Pain modulation pathways and central antinociceptive network
 - a) Hypothalamus
 - b) Periaqueductal gray
 - c) Raphe nuclei
 - d) Locus Coeruleus
 - e) Limbic system

B. Pathophysiology

1. Head and face pain models
 - a) Animal
 - b) Human
2. Individual disorders
 - a) Migraine
 - 1) The Sensitive Brain
 - 2) Aura
 - 3) Migraine headache – history of hypotheses
 - 4) Migraine headache – central transmission
 - 5) Serotonin
 - b) Tension type headache
 - 1) Episodic tension type headache and migraine without aura
 - c) Cluster headache and Trigeminal Autonomic Cephalalgias (TACS)
 - 1) Human models
 - 2) Imaging
 - 3) CPH
 - 4) SUNCT
 - d) Neuralgias of the head and face
 - 1) Trigeminal Neuralgia (Tic Douloureux)
 - i. Implications of medical therapies including carbamazepine
 - ii. Imaging
 - iii. Surgical/vascular decompression
 - 2) Occipital Neuralgia
 - e) Post-traumatic headache

- f) Headache attributed to sinus or dental disease
 - 1) Pain referral patterns
 - 2) Pathways
- g) Abnormalities of cerebrospinal fluid pressure
 - 1) Pathobiology
 - 2) Imaging
 - 3) Pathophysiologic correlation with symptoms
 - A. Idiopathic intracranial hypertension
 - B. Spontaneous or provoked intracranial hypotension.

C. Headache Pharmacology

III. Headache Classification and Diagnosis

A. International Classification of Headache Disorders – 2 (ICHD-2)

1. Principles of classification

B. Primary and Secondary Headache Differentiation

1. Primary Headache. At completion, the trainee must demonstrate the ability to:

- a) Distinguish headaches of primary origin from those resulting from secondary cause.
- b) Describe the differences among the primary headache types and make appropriate diagnosis based on evidence-based criteria.
- c) Diagnose the primary headaches in a non-acute, out patient setting.
- d) Assess the severity of disease on the basis of headache type, frequency, severity, associated symptoms and comorbid features complicating diagnosis and treatment

2. Secondary Headache

a) Acute Headache. At completion, the trainee must demonstrate the ability to:

- 1) Rule out headache associated with acute morbidity and mortality (e.g. acute subarachnoid hemorrhage {ASAH}, Pheochromocytoma, acute glaucoma, acute frontal, ethmoid or sphenoid sinusitis, meningitis with fever, giant cell arteritis, etc.).
- 2) Assess the patient with acute headache and concurrent medical or neurologic complaints.
- 3) Discuss the probable diagnosis in a patient presenting with a chief complaint of acute headache.
- 4) Direct the evaluation and care of acute headache.
- 5) Guide treatment and appropriate follow-up of patients presenting with a chief complaint of acute headache.

b) Secondary Subacute and Chronic Headache. At completion, the trainee must demonstrate the ability to:

- 1) Rule in secondary causes of headache, especially those with reliable historical, physical examination and/or test-related features (red flags) (e.g. temporal arteritis, high and low cerebrospinal fluid pressure, traumatic brain injury, trigeminal neuralgia, meningitis, etc.).
- 2) Assess the patient with subacute, non-recurrent headache and concurrent medical or neurologic complaints.
- 3) Discuss the differential diagnosis in a patient presenting with complaint of subacute headache.
- 4) Direct the evaluation and care of subacute non-recurrent headache including interpretation of test findings and results.

- 5) Guide treatment and appropriate follow-up care of patients with secondary headache including considerations for concurrent medical, neurologic or surgical disease.
- 6) Discuss the natural history of post-traumatic headache in patients with mild to moderate head injury.
- 7) Discuss the evaluation of patients presenting with headache or facial pain associated with cranial nerve complaints.

C. Primary Headache

1. Migraine
 - a) Discuss the ICHD criteria for migraine without aura, migraine with aura, and the subtypes of migraine including basilar, familial hemiplegic and migrainous stroke, and its implications for treatment
 - b) Describe the epidemiology of migraine in America.
2. Tension Type
3. Cluster and Trigeminal Autonomic Cephalalgias
4. Neuralgias
5. Chronic Daily Headache

D. Secondary Headache, including but not limited to:

1. Stroke
2. Venous Sinus thrombosis
3. Arteritis
4. Arterial dissection
5. Brain Tumor
6. Sinusitis
7. Meningitis and encephalitis
8. Intracranial pressure abnormalities
9. Toxic and metabolic
10. Disorders of homeostasis (see Chapter 10 ICHD-2)
11. Medication overuse
12. Dental, temporomandibular joint disorders
 - a) Myofascial Pain
13. Cervicogenic

E. Pediatric Headache

The trainee must be able to:

1. Discuss the evaluation of pediatric patients presenting with acute headache unassociated with systemic or neurologic complaints or findings.
2. Describe the presentation of pediatric patients with precursors and equivalents of migraine.
3. Develop appropriate testing strategies and treatment for pediatric patients presenting with subacute and chronic headache.
4. Coordinate multidisciplinary evaluation and care of the pediatric patient with significant social, familial, or personal complications and comorbidities.

IV. Evaluation and Diagnostic Testing

- A. History and Physical Examination
 - 1. An adequate knowledge of general neurology is required to critically evaluate the history and physical examination of the patient presenting with headaches
- B. Imaging
 - 1. Computed tomography (CT), CT angiography
 - 2. Magnetic resonance imaging (MRI), MR angiography, MR venography
 - 3. CT and MRI myelography
 - 4. Catheter angiography
- C. Lumbar Puncture
 - 1. Diagnostic
 - 2. Therapeutic
- D. Radionuclide Cisternography
- E. Electroencephalography (EEG) (See American Academy of Neurology Practice Guidelines)
- F. Other
 - 1. Polysomnography
 - 2. Tissue biopsy
 - 3. Blood tests
 - 4. Electrocardiogram, echocardiogram

V. Treatment

- A. Principles of Disease Management and Evidence Based Practice
 - 1. Outline the general principles underlying the ICHD-2 (Cephalalgia 24 {Supp 1}. 2004) of the International Headache Society
 - 2. US Headache Consortium Guidelines for headache diagnosis and treatment
- B. Patient Communication
 - 1. Education
 - 2. Counseling
- C. Therapeutic Modalities
 - 1. Behavioral and non-pharmacologic
 - 2. Pharmacologic
 - 3. Physical techniques including but not limited to nerve blocks, cervical facet joint injections, trigger point injections, botulinum toxin, chemodenervation, acupuncture, physical therapy, exercise
- D. Advanced Therapies
 - 1. Parenteral therapy
 - 2. Inpatient treatment
 - 3. Ablative therapy (trigeminal rhizotomy, trigeminal section)
 - 4. CNS treatments (e.g. shunts, deep brain stimulation)
 - 5. PNS treatments (e.g. occipital nerve stimulation)

- E. Individual Disorders
 - 1. Primary headaches
 - a) Migraine
 - 1) Acute, symptomatic and rescue
 - i. Specific
 - A. Triptan
 - 1. Indications
 - 2. Contraindications
 - B. Ergots including Dihydroergotamine
 - ii. Non-specific
 - A. NSAID
 - B. Analgesic
 - C. Dopaminergic
 - iii. Medications associated with overuse (Rebound)
 - 2) Preventive
 - i. Indications
 - ii. Comorbidity and contraindications
 - iii. Know the major classes of preventives of migraine including beta-adrenergic blockers, Tricyclic antidepressants, calcium channel blockers, anticonvulsants and atypical
 - iv. Understand the use of methysergide
 - b) Tension Type Headache
 - c) Trigeminal Autonomic Cephalalgias
 - 1) Cluster
 - i. Episodic
 - ii. Chronic
 - 2) Paroxysmal Hemicrania and Indomethacin
 - 3) SUNCT
 - d) Other Primary Headaches
 - 1) Exercise
 - 2) Coital
 - e) Neuralgias including Trigeminal Neuralgia
 - 2. Secondary headaches
 - a) Idiopathic Intracranial Hypertension
 - b) Intracranial Hypotension
 - 1) Post-dural puncture
 - 2) Spontaneous
 - c) Disorders of homeostasis including sleep apnea
 - d) Medication overuse
 - 3. Chronic daily headache (primary and secondary)
 - a) Outpatient treatment
 - b) Indications for inpatient treatment
 - 1) Protocols including repetitive dose parenteral therapy, behavioral management and detoxification.
- F. Special Populations
 - 1. Pediatric
 - a) Pharmacologic
 - b) Behavioral
 - 2. Pregnancy
 - 3. Elderly
 - 4. Concurrent medical illness