Primary Headache

Christy M. Jackson, MD
Director, Dalessio Headache Center
Scripps Clinic, La Jolla

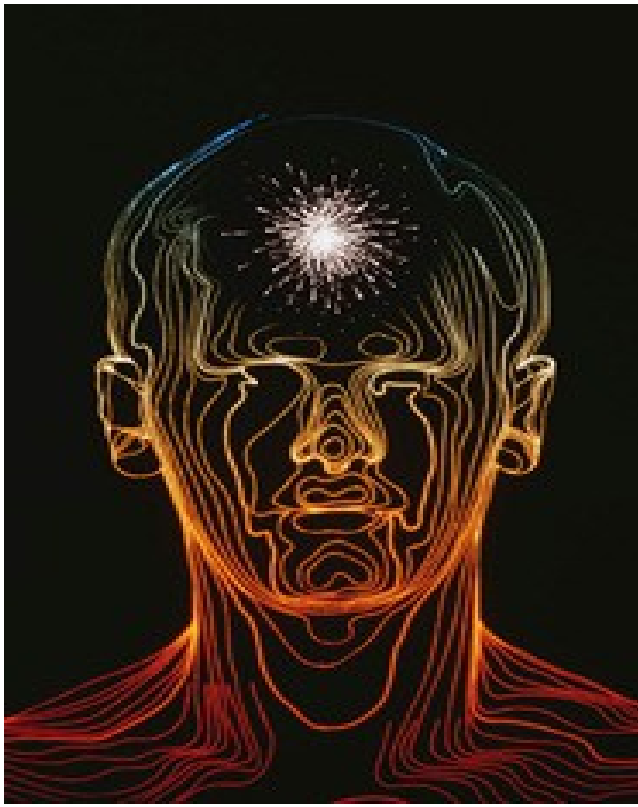
Faculty Disclosure

Company	Nature of Affiliation	Unlabeled Product Usage
• Allergan	• Speaker	None

International Classification of Headache Disorders

4 Primary Headache Categories

- 8 Secondary Headache Categories
- Trigeminal Autonomic Cephalalgias



ICHD-2 Primary Headaches

***Table 1** First level of* The International Classification of Headache Disorders, 2nd edition

Part one: The primary headaches

1. Migraine
2. Tension-type headache (TTH)
3. Cluster headache and other trigeminal autonomic cephalalgias
4. Other primary headaches

Lipton, RB, et.al. Neurology 2004;63:427-435

ICDH -2 Secondary Headaches

Part two: The secondary headaches

5. Headache attributed to head and/or neck trauma
6. Headache attributed to cranial or cervical vascular disorder
7. Headache attributed to non-vascular intracranial disorder
8. Headache attributed to a substance or its withdrawal
9. Headache attributed to infection
10. Headache attributed to disorder of homoeostasis
11. Headache or facial pain attributed to disorder of cranium, neck, eyes, ears, nose, sinuses, teeth, mouth, or other facial or cranial structures
12. Headache attributed to psychiatric disorder

Lipton, RB, et.al. Neurology 2004;63:427-435

Secondary (Organic) Headaches

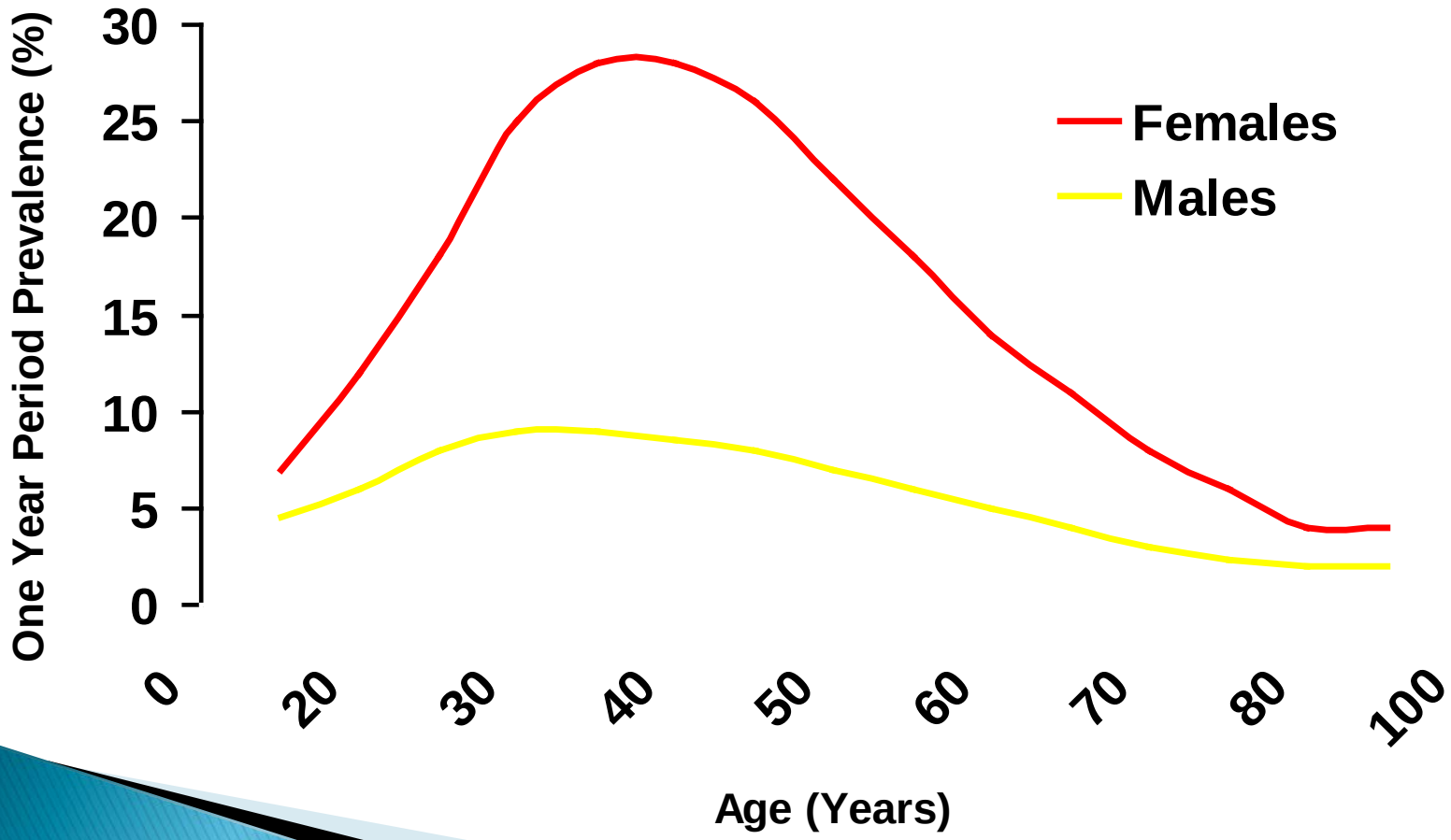
- Meningitis
- Subarachnoid Hemorrhage
- Pseudotumor
- Temporal Arteritis
- Glaucoma
- Sinus/Dental Infection

Differential Diagnosis of Primary Headaches

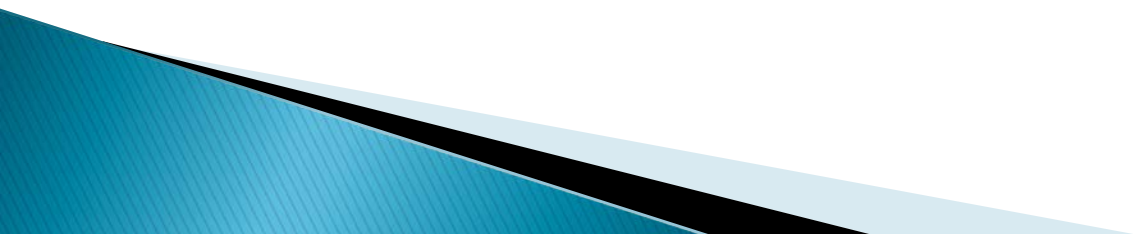
	Migraine	Tension-type	Cluster
Pain location	Unilateral	Bilateral	Unilateral
Duration	4-72 hrs	30 min - 7 days	15-180 min
Quality	Pulsating, throbbing	Pressure, steady	Boring
Pain severity	Moderate to severe	Mild to moderate	Severe
Associated features	Nausea, vomiting, photophobia, phonophobia	None	Nighttime attacks, lacrimation, nasal congestion

Migraine Prevalence

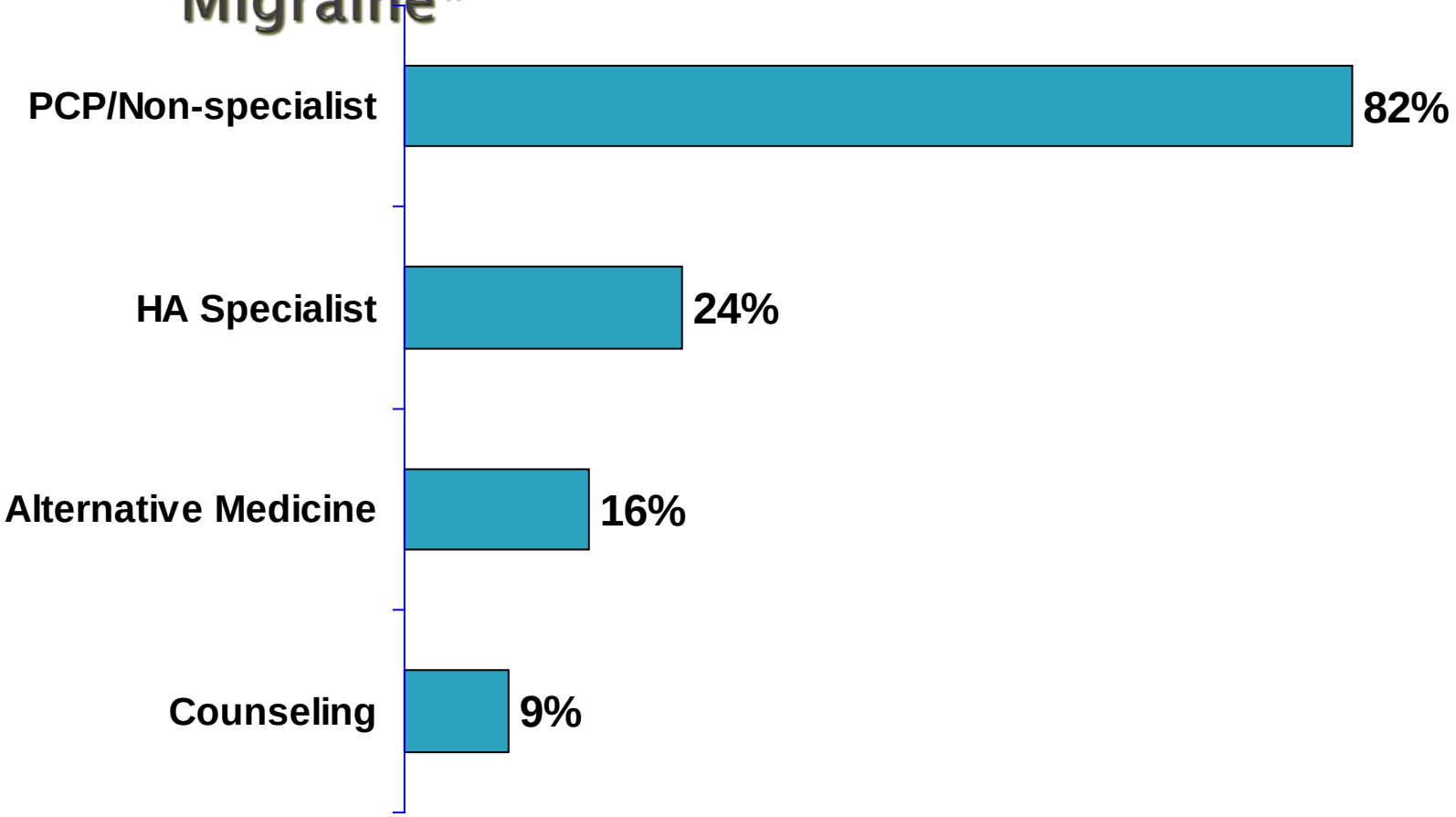
Migraine Prevalence Peaks in the 25-55 Age Range for Both Genders



Consulting Patterns



PCP/Non-specialists Lead the List of Healthcare Practitioners Consulted Prior to a Diagnosis of Migraine*



Scripps Migraine Management in Primary Care

Establish Diagnosis & Treatment Needs (History, [1] Diary, MIDAS etc) → Complicated Migraine / Stroke-like symptoms → Refer to Neurology

Low Tx Needs	Medium Tx Needs	High Tx Needs

Education, Self Management & Non-Pharmacological Care: (Trigger mgmt, diet, exercise, PT & integrative approaches) Refer as appropriate [2] (page 2)

Low Tx Needs
1-2 HA days/mo
Mild to moderate pain

Abortive :
Naproxen 550, Diclofenac 50 mg, short acting triptan (oral, nasal, SQ) or Migranol Nasal Spray
Alternatives:
Tramadol 50-100mg
Butalbital with caffeine - no more than 6 days per month
Nausea:
Ondansetron, Phenergan or Compazine (suppository)

Plateau? Yes → Annual exam; No → Refer to Neurology

Medium Tx Needs
Less than 15 days/mo
Moderate Pain

Preventative:
If sleep disturbance present,
Elavil 10 mg-30 mg as tolerated
If no sleep disturbance:
Namenda XR 7-28 mg titration
Topamax 25-100 mg titration
Propranolol LA 80-240 mg
SSRIs, Neurontin of lesser benefit

Abortive meds to be used only 2 days per week

Plateau? Yes → Annual exam; No → Refer to Neurology

High Tx Needs
Greater than 15 days/mo, UCC visits

Meds:
Prophylaxis along with Medication Overuse Protocol using prednisone and taper from analgesics
Additional:
Botulinum toxin
Consider Ketoralac injections/nasal spray
Occipital and Trigeminal Nerve Blocks

... Plateau? Yes → Annual exam; No → Refer to Neurology

Consider:
[3] injections/ Procedure

Acute Management

Treatment in Primary Office:
Differentiate from
1 chronic pain found newly intolerable
2.New illness of great pathologic significance(SAH, temporal arteritis, craniocervical disease)
Acute Rescue IM: Toradol 30-60 mg IM, Phenergan 25 mg IM, TPI, Sumatriptan 6 mg SQ: If fails, Demerol
Acute Rescue IV: Magnesium 1000mg, Toradol 30 mg, Depacon 500 mg, Decadron 10 mg, Phenergan 25 mg,

[2] Injection / Intervention:
Botulinum Toxin A
ONB without steroid
Trigeminal Blocks without steroid
TPIs

[2] Imaging: Indicated if exam abnormal, history atypical (explosive onset, worsens with Val Salva or cough), onset over age 40. CT with and without indicated, if posterior fossa or vascular lesion suspected, MRI/MRA indicated

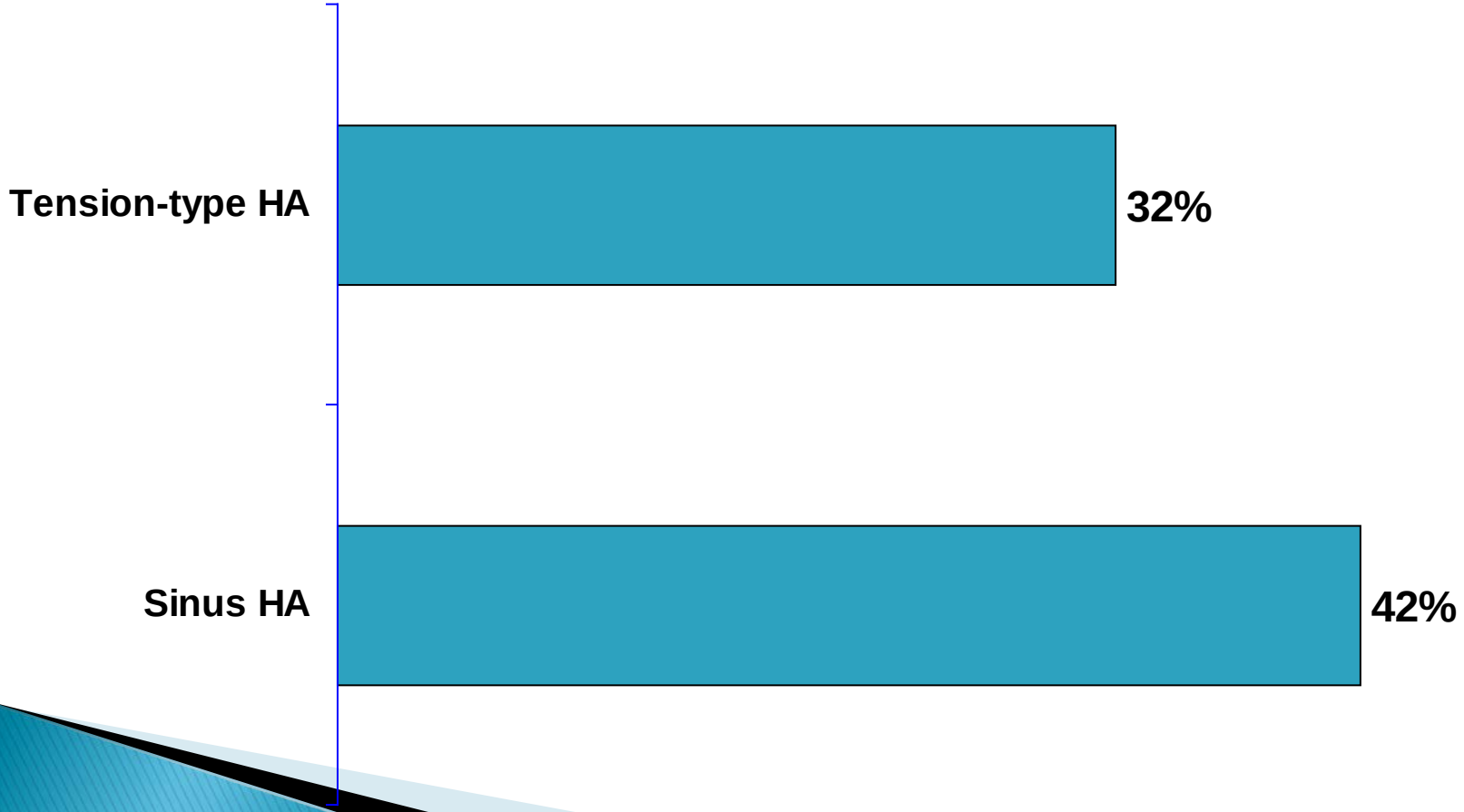
[1] Diagnosis:
a. Nausea with HA?
b. HA limited ADLs ≥ day / 3 months?
c. Light bothersome during HA?
2 /3 = PPV 93%; 3/3 : PPV [illegible]
Lipton RB et al. Neurology, 2003

[1] History is Key:
Age of onset, description
Triggers
FHx
[illegible](stressors)

4. MOH protocol

Christy Jackson MD, Robert Bonakdar MD

Undiagnosed Migraine Sufferers Often Receive Other Medical Diagnoses



Criteria for office diagnosis of migraine with aura

A. Headache pain is preceded by at least one of the following neurologic symptoms:

- Visual
  - Scintillating scotoma
  - Fortification spectra
  - Photopsia
- Sensory
  - Paresthesia
  - Numbness
  - Unilateral weakness
  - Speech disturbance (aphasia)

B. No evidence of organic disease

Criteria for office diagnosis of migraine without aura

A. Two of the following:

- Unilateral headache pain location
- Headache pain has pulsating quality
- Nausea
- Photophobia and phonophobia

B. Both of the following:

- Similar pain in the past
- No evidence of organic disease

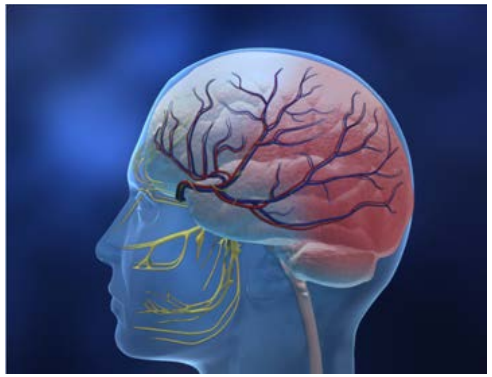
Hierarchy of Migraine Manifestation

- **Level 1:** Moderate/intermittent—respond well to OTC medications
- **Level 2:** Intense—unresponsive to OTC medications
- **Level 3:** Less responsive to simple interventions—preventive and abortive medications sought
- **Level 4:** Daily headaches associated with analgesic overuse

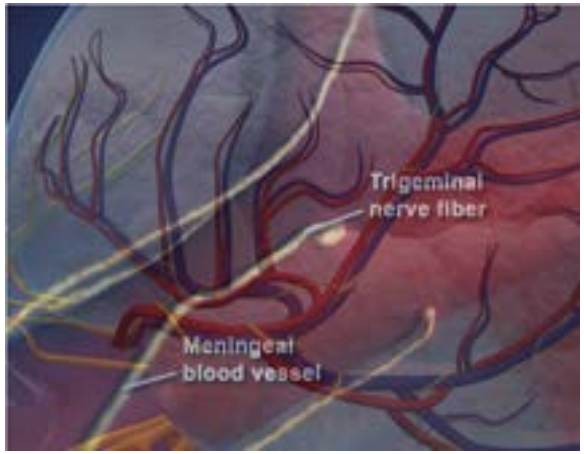
Migraine Activity May Start in the Cortex with Cortical Spreading Depression

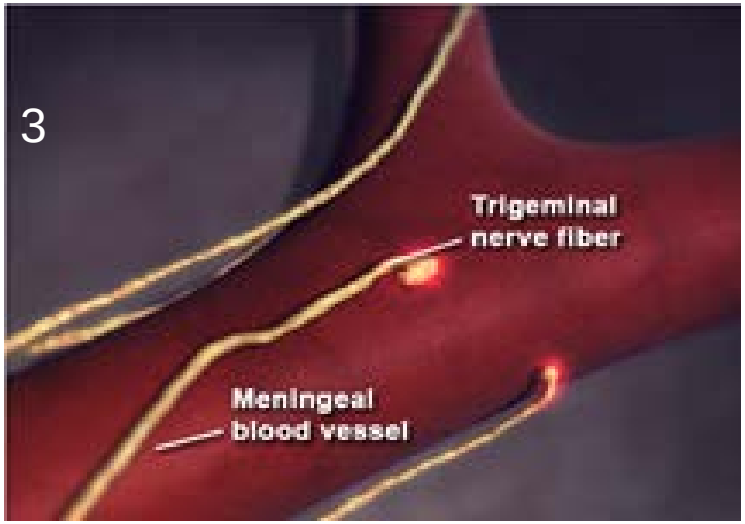
Welch M et al. *Headache*. 2005 Apr; 45 Suppl 1:S25-32.
Van den Maagdenberg AM et al. *Neuron.* 2004;41:701 10.
Lauritzen M. *Brain.* 1994;117:199–210.

Trigeminal Nerves Surrounding Meningeal Blood Vessels are Activated



Trigeminal nerve fibers in the meningeal blood vessel

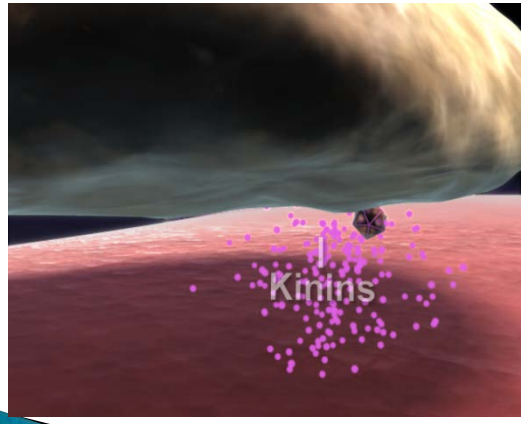


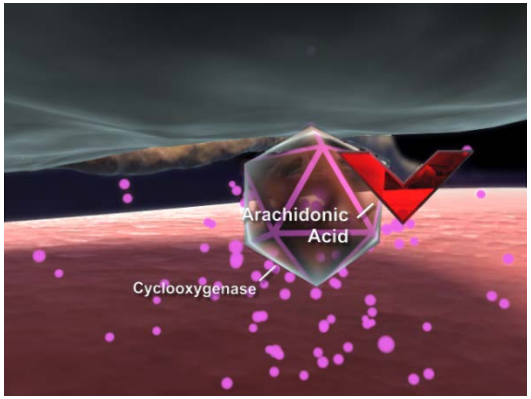


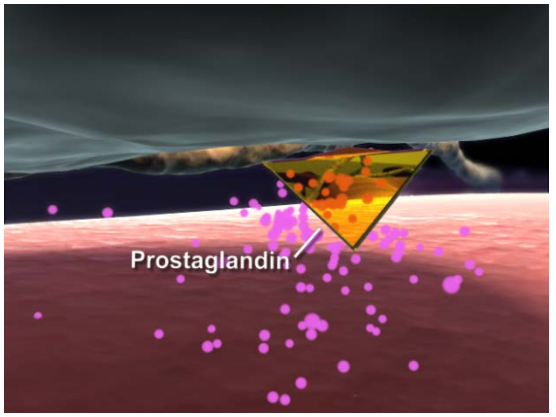
Bolay H et al. *Nature Medicine.* 2001;8:136-142.
Williamson DJ, Hargreaves RJ. *Microsc Res Tech.* 2001;53:167-78

Neurochemical Release leads to Neurochemical Production

- Kinins start the process leading to prostaglandin synthesis
  - Kinins facilitate the production of cyclooxygenases
  - Cyclooxygenases convert arachidonic acid to prostaglandins



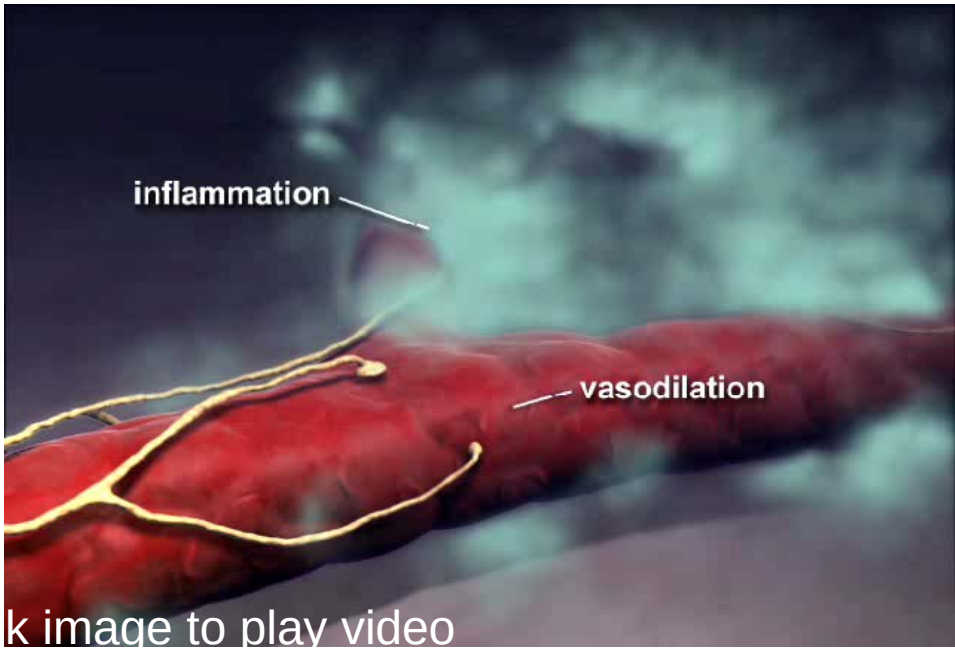




Woolf CJ. *Ann Intern Med.* 2004;140:441-451.

Inflammation and Vasodilation of Local Blood Vessels and Surrounding Tissue

- Prostaglandin Synthesis leads to inflammation
- CGRP release leads to vasodilation



Waeber C, Moskowitz MA. *Neurology* 2003;61(Suppl 4):S9-20.

Treatment of Migraine

- Nonpharmacologic
- Pharmacologic
  - Acute (abortive)
  - Preventive (prophylactic)

Non Pharmacologic Prevention

DALESSIO HEADACHE CENTER AT SCRIPPS CLINIC

C **CAFFEINE:** Limit to 8 ounces daily. Avoid frequent usage of decongestants, energy drinks and supplements

A **ACTIVITY**: Assure 30 minutes every other day of continuous physical activity. Check with your primary care physician to determine what your target heart rate should be.

S **SLEEP**: 6-8 hours of uninterrupted sleep is needed. Do not change times of waking on weekends. Arise from bed when you naturally awaken and get exposure to natural sunlight by walking outside for a few moments.

H **HORMONES**: Monitor estrogen imbalance by being alert for hot flashes, night sweats. Monitor for thyroid imbalance by monitoring for constipation, unexplained fatigue, dry skin or hair loss.

Preventive Medications-take daily	Abortive Medications-as needed for relief
_____	_____
_____	_____
_____	_____

Potential triggers of migraine

- Hormones
- Chronobiologic challenges
- Carbon monoxide
- Sensory stimuli
- Foods and beverages
- Drugs
- Emotional stress

Integrative Approaches to Headache Management

- Evidence Based usage of supplements
  - Riboflavin
  - Magnesium
  - Petadolax
  - Coenzyme Q10
- Biofeedback
- Acupuncture
- Physical Therapy

Consider Preventive Medication

- When headache-related disability occurs ≥3 days /mo
- When symptomatic medications are
  - Ineffective
  - Contraindicated
  - Likely to be overused
- When special circumstances exist
  - Attacks produce profound disability
  - Attacks produce prolonged auras
  - True migrainous infarction

Prophylaxis in Migraine

- Topamax
- Namenda XR – use in pregnancy
- Propranolol
- Amitriptyline
- Amlodipine
- Lisinopril
- Cyproheptadine in children and pregnancy

Prophylaxis, cont'd

- Topamax – mental fog, paresthesias, anorexia, emotional lability
- Namenda XR – dizziness
- Propranolol LA – hypotension, fatigue
- Amitryptyline– sedation, dry mouth, weight gain
- Amlodipine – hypotension, LE edema, constipation
- Depakote ER – leucopenia, LFTs, tremor, weight gain

Diagnostic Criteria for Chronic Migraine

- **Chronic Migraine is a defined condition[1-3]***
  - 15 or more headache days per month
  - Headaches lasting 4 hours per day or more
  - At least 8 headache days that are linked to migraine or that respond to migraine-specific medication[2,3]
  - With or without medication overuse

*Multiple headache phenotypes are possible.[1,2]

1.Headache Classification Committee. *Cephalalgia.* 2004;24(suppl 1):9-160.

2.Headache Classification Committee; Olesen J et al. *Cephalalgia*. 2006;26:742-746.

3.Lipton RB. *Headache*. 2011;51(S2):77-83

Chronic Migraine Therapy

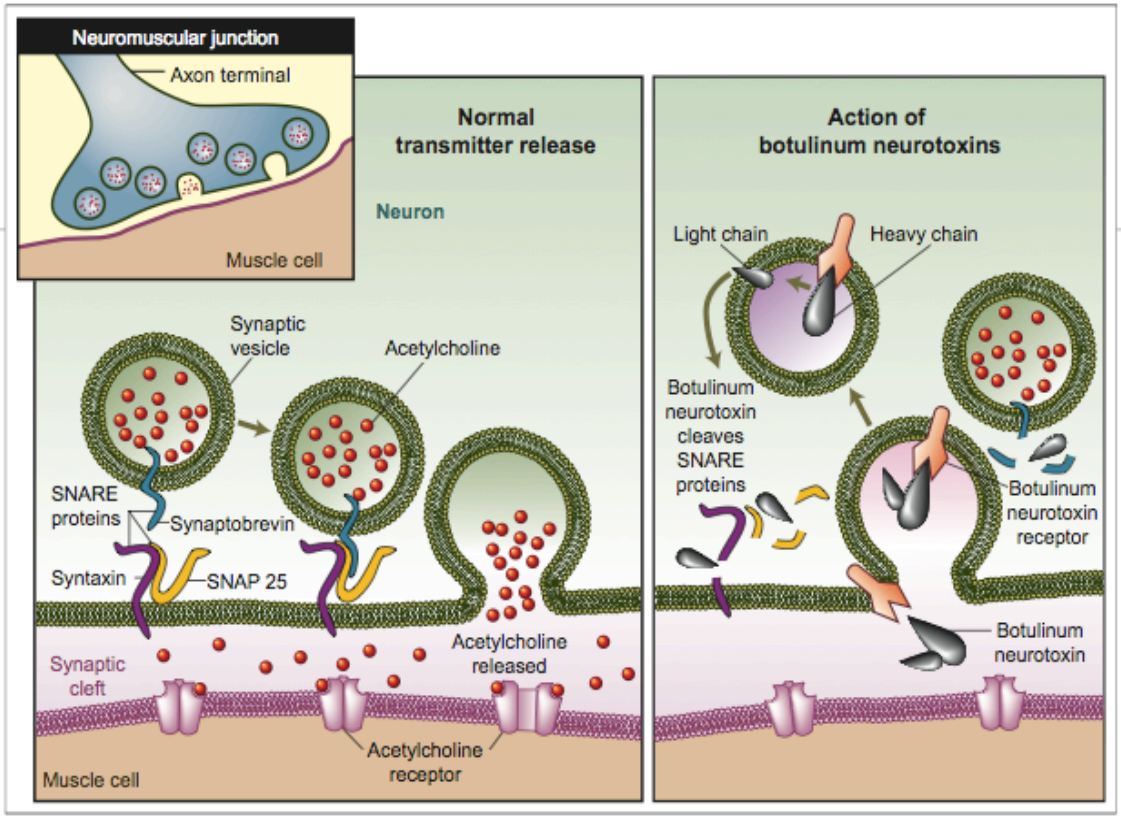
Botulinum Toxin A

- Proven in PREEMPT trial to be effective in lowering HA days by 50%
- Diagnosis of Chronic Migraine necessary
- Approved by insurance of pt has failed trials of 2-3 prophylactic meds over 6 months
- Injections every 3 months
- Medication Overuse Headache included

Hypotheses:Mechanisms of Botox A in Headache

- May reduce pericranial muscular tension and contractions
- May directly affect sensory nerves – possibly reducing neuropeptide release

Botulinum Toxin



Differential Diagnosis of Primary Headaches

	Migraine	Tension-type	Cluster
Pain location	Unilateral	Bilateral	Unilateral
Duration	4-72 hrs	30 min - 7 days	15-180 min
Quality	Pulsating, throbbing	Pressure, steady	Boring
Pain severity	Moderate to severe	Mild to moderate	Severe
Associated features	Nausea, vomiting, photophobia, phonophobia	None	Nighttime attacks, lacrimation, nasal congestion

Criteria for office diagnosis of cluster headache

A. Severe unilateral orbital, supraorbital, and/or temporal pain lasting 15 to 180 minutes

B. At least one of the following on the headache side:

- Conjunctival injection
- Facial sweating
- Lacrimation
- Miosis
- Nasal congestion
- Ptosis
- Rhinorrhea
- Eyelid edema

C. No evidence of organic disease

Cluster: patient behavior

- *restless*
- *often paces or sits up*
- *reports of violence during attack*
- *may scream or moan*
- *lowers head with pressure over eye*
- *period of exhaustion follows*

Cluster: patient features

- *high incidence of duodenal ulcers and gastric acid levels*
- *ruddy complexion, orange-peel skin*
- *deep nasolabial folds*
- *increased incidence of hazel eye color*
- *heavy smokers*
- *increased alcohol usage vs controls*

Cluster: pathogenesis

- *intracavernous carotid artery*
- *trigeminovascular activation*
- *sympathetic and parasympathetic activation*

Cluster Headache Treatment

- Acute Therapy
  - High Flow Oxygen
  - Triptan
  - DHE
- Suppressant Therapy
  - Steroids
  - Indomethacin
  - Ca Channel Blocker
  - Lithium
  - Topiramate

Differential Diagnosis of Primary Headaches

	Migraine	Tension-type	Cluster
Pain location	Unilateral	Bilateral	Unilateral
Duration	4-72 hrs	30 min - 7 days	15-180 min
Quality	Pulsating, throbbing	Pressure, steady	Boring
Pain severity	Moderate to severe	Mild to moderate	Severe
Associated features	Nausea, vomiting, photophobia, phonophobia	None	Nighttime attacks, lacrimation, nasal congestion

Criteria for office diagnosis of episodic tension-type headache

A. Headache pain accompanied by two of the following symptoms:
- Pressing/tightening (nonpulsating) quality
- Bilateral location
- Not aggravated by routine physical activity

B. Headache pain accompanied by both of the following symptoms:
- No nausea or vomiting
- Photophobia and phonophobia absent or only one present

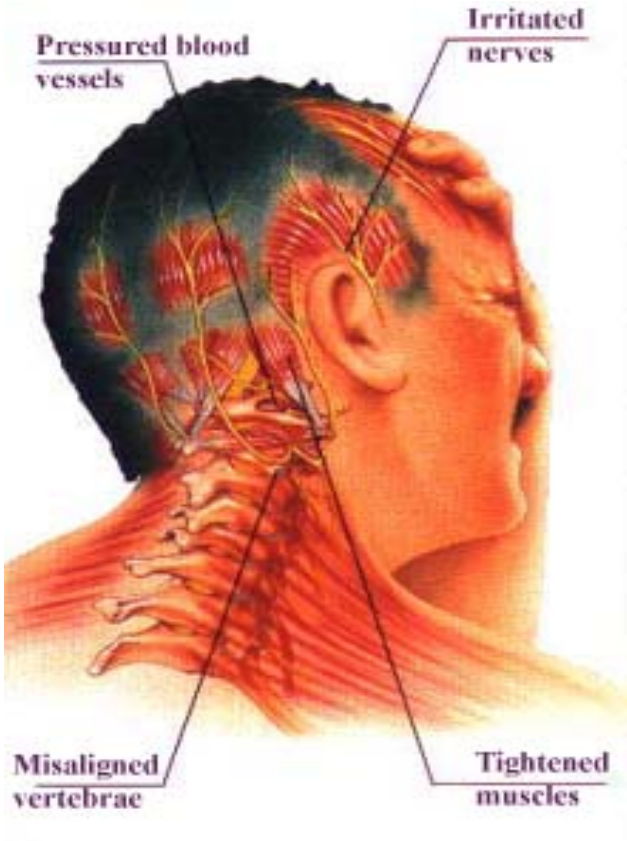
C. Fewer than 15 days per month with headache

D. No evidence of organic disease

Tension Type Headache Treatment

Acute: NSAIDS
Tramadol
Local
heat/cold
Valium

Preventive: TCA
NSAIDS
Physical
Therapy



Cervicogenic Headache

- Side Locked
- Originates at base of skull and travels up over scalp to eye
- May become pulsatile
- Does not meet criteria for migraine
- Responds to occipital nerve blocks, indomethacin

Medication Overuse Headache

- ICHD Criteria revised 2006
- Daily headache, diffuse and bilateral
- Waking with headache
- Headache when medication is withdrawn
- Tolerance to abortive medication
- No response to preventive medication

- International Headache Society (2004). "The International Classification of Headache Disorders: 2nd edition". *Cephalalgia* **24** (Suppl 1): 9–160.

New Options for Migraine Treatment

- Calcitonin Gene Receptor Protein (CGRP) Inhibitor – Telcagepant
- Occipital Nerve Stimulation
- Sumatriptan Air Injector
- Sumatriptan patch
- DHE Inhalation Apparatus

Scripps Migraine Management in Primary Care

Establish Diagnosis & Treatment Needs (History, [1] Diary, MIDAS etc) → Complicated Migraine / Stroke-like symptoms → Refer to Neurology

Low Tx Needs	Medium Tx Needs	High Tx Needs

Education, Self Management & Non-Pharmacological Care: (Trigger mgmt, diet, exercise, PT & integrative approaches) Refer as appropriate [2] (page 2)

Low Tx Needs
1-2 HA days/mo
Mild to moderate pain

Abortive :
Naproxen 550, Diclofenac 50 mg, short acting triptan (oral, nasal, SQ) or Migranol Nasal Spray
Alternatives:
Tramadol 50-100mg
Butalbital with caffeine - no more than 6 days per month
Nausea:
Ondansetron, Phenergan or Compazine (suppository)

Plateau? Yes → Annual exam; No → Refer to Neurology

Medium Tx Needs
Less than 15 days/mo
Moderate Pain

Preventative:
If sleep disturbance present,
Elavil 10 mg-30 mg as tolerated
If no sleep disturbance:
Namenda XR 7-28 mg titration
Topamax 25-100 mg titration
Propranolol LA 80-240 mg
SSRIs, Neurontin of lesser benefit

Abortive meds to be used only 2 days per week

Plateau? Yes → Annual exam; No → Refer to Neurology

High Tx Needs
Greater than 15 days/mo, UCC visits

Meds:
Prophylaxis along with Medication Overuse Protocol using prednisone and taper from analgesics
Additional:
Botulinum toxin
Consider Ketoralac injections/nasal spray
Occipital and Trigeminal Nerve Blocks

... Plateau? Yes → Annual exam; No → Refer to Neurology

Consider:
[3] injections/ Procedure

Acute Management

Treatment in Primary Office:
Differentiate from
1 chronic pain found newly intolerable
2.New illness of great pathologic significance(SAH, temporal arteritis, craniocervical disease)
Acute Rescue IM: Toradol 30-60 mg IM, Phenergan 25 mg IM, TPI, Sumatriptan 6 mg SQ: If fails, Demerol
Acute Rescue IV: Magnesium 1000mg, Toradol 30 mg, Depacon 500 mg, Decadron 10 mg, Phenergan 25 mg,

[2] Injection / Intervention:
Botulinum Toxin A
ONB without steroid
Trigeminal Blocks without steroid
TPIs

[2] Imaging: Indicated if exam abnormal, history atypical (explosive onset, worsens with Val Salva or cough), onset over age 40. CT with and without indicated, if posterior fossa or vascular lesion suspected, MRI/MRA indicated

[1] Diagnosis:
a. Nausea with HA?
b. HA limited ADLs ≥ day / 3 months?
c. Light bothersome during HA?
2 /3 = PPV 93%; 3/3 : PPV [illegible]
Lipton RB et al. Neurology, 2003

[1] History is Key:
Age of onset, description
Triggers
FHx
[illegible](stressors)

4. MOH protocol

Christy Jackson MD, Robert Bonakdar MD

Migraine Disability and Assessment Scale (MIDAS)

- 1 These questions are used to determine your score, which then is matched to a level of disability. On how many days in the last 3 months did you miss work or school because your headaches?
- 2 How many days in the last 3 months was your productivity at work or school reduced by half or more because of your headaches? (Do not include days you counted in question 1 where you missed work or school.)
- 3 On how many days in the last 3 months did you not do household work because of your headaches?
- 4 How many days in the last three months was your productivity in household work reduced by half of more because of your headaches? (Do not include days you counted in question 3 where you did not do household work.)
- 5 On how many days in the last 3 months did you miss family, social or leisure activities because of your headaches?
- 6 Once you've answered these questions, add up the total number of days to determine your level of "disability"

- 0 to 5, MIDAS Grade I, Little or no disability
- 6 to 10, MIDAS Grade II, Mild disability
- 11 to 20, MIDAS Grade III, Moderate disability
- 21+, MIDAS Grade IV, Severe disability

Cefaly – FDA Approved Device for Migraine Prevention

- Approved today
- PREMICE study, 2009-11
- Conducted in Belgium, 67 patients
- Migraine with or without aura
- At least 2 attacks per month, no MOH
- 20 minutes daily use decreased migraines by 2 days per month

- Neurology: Volume 80(8), 19 February 2013, p 697-704

Supraorbital Transcutaneous Stimulation