Idiopathic Intracranial Hypertension (IIH), also known as pseudotumor cerebri, is a neurological disorder attributable to elevated intracranial pressure. If not properly diagnosed and/or managed, IIH may lead to progressive – and possibly permanent – loss of vision. In addition, patients may be exposed to excessive radiation and/or may make frequent emergency department visits.

The goals of IIH treatment are vision preservation, treatment of comorbid conditions (i.e., weight management), and symptom alleviation. Narcotics are NOT recommended for IIH headache.

Algorithm 1. IIH New Suspected Diagnosis

**Clinical suspicion or features concerning for increased ICP:**
- Holocranial or frontal headache, often worse when laying flat.
- Pulsatile tinnitus (“whooshing sound in ears”)
- Transient visual obscurations, particularly with position change

**Features suggestive of migraine:**
- Classic visual aura
- Episodic
- Photophobia
- Phonophobia
- Nausea/vomiting

**Excluding criteria:**
- Any cranial neuropathy other than CN II or CN VI
- Any other focal neurologic finding or symptom
- Trauma or altered LOC
- Sudden/worst headache of life
- Meningismus/fever

**Headache Triage:**

- **Ophthalmology Evaluation**
  - Assessment and grading of optic disc edema

- **Clinical suspicion or features concerning for increased ICP:**
  - Any grade bilateral edema (considered neuro ophthalmologic emergency)
  - No edema: Consider alternative diagnosis (though increased ICP not excluded)

- **Features suggestive of migraine:**
  - Abnormal neuroimaging proceed with appropriate workup
  - If lower risk/mild presentation, discuss with Neuro Ophthalmology to determine if Lumbar Puncture (LP) can be done on an outpatient basis (ED provider may enter outpatient order for LP under fluoro)

- **Excluding criteria:**
  - Inappropriate for IIH workup, proceed with standard emergent neuroimaging

- **Urine pregnancy test MRI brain w/wo gadolinium MRI venogram brain (MRV)**
  - Normal neuroimaging with or without the following signs of increased ICP:
    - Dilated optic nerve sheath
    - Flattening of posterior globe
    - Empty sella

- **Lumbar puncture**
  - Bedside LP attempted most experienced practitioner available, consider ultrasound guidance to minimize attempts and provide most accurate measurement. If patient BMI > 40 may proceed to fluoro without bedside attempt.
    - ICP measurement in lateral decubitus position (prone if fluoro)
    - CSF counts, protein, glucose, cytology, cultures*
  - *Do not discharge before counts are resulted

- **Higher Risk Presentation**

- **Mild to moderate Papilledema + Elevated Opening Pressure, Normal CSF studies**
  - Ophthalmology will provide dosing recommendations for medical management and outpatient follow-up

- **Severe (vision threatening) Papilledema + Elevated Opening Pressure, Normal CSF studies**
  - Admission to Ophthalmology service for initiation medical +/- surgical management, will involve Neurosurgery if indicated inpatient
Algorithm 2. Patients with Previous IIH Diagnosis

**Clinical suspicion or features concerning for increased ICP:**
- Holocranial or frontal headache, often worse when laying flat.
- Pulsatile tinnitus (“whooshing sound in ears”)
- Transient visual obscurations, particularly with position change

**Features suggestive of migraine:**
- Classic visual aura
- Episodic
- Photophobia
- Phonophobia
- Nausea/vomiting

**“Red Flag” criteria:**
- Any cranial neuropathy other than CN II or CN VI
- Any other focal neurologic finding or symptom
- Trauma or altered LOC
- Sudden/worst headache of life
- Meningismus/fever

**Low Pressure Headache, patient with shunt or LP within the last two weeks:**
- Positional headache often posterior head/neck worse when upright
- +/- nausea
- No fever
- No meningismus

**Ophthalmology Evaluation**
Assessment and grading of optic disc edema

**Attempt non-narcotic medical management for migraine first**
If symptoms resolve, discharge and recommend call to schedule outpatient follow-up

**Inappropriate for IIH workup, proceed with standard emergent neuroimaging**

**Decide inpatient vs. outpatient management per ophthalmology (case-by-case decision)**

**Patient has a shunt?**

**Lower Risk:**
- Absent, mild, moderate degree of edema without previous ONSF or history of optic atrophy
- Normal or stable visual acuity
- Non-severe headache

**Higher Risk:**
- Significant worsening of vision or papilledema from baseline
- High grade papilledema
- Severe/intractable headache
- No concern for other neurologic process

**Patient has a shunt?**

**Consider:**
- Neurosurgery consult for empiric shunt adjustment if programmable.
- Addition of Diamox
- Outpatient follow-up with ophthalmology and neurosurgery per their consult recommendations

**Medication titration per ophthalmology recommendation**
**Outpatient follow up**
*If already on max consider outpatient diagnostic/therapeutic LP and consider outpatient neurosurgery referral for surgical options

*No imaging recommended unless clinical concern

**Diagnostic/Therapeutic LP:**
- Bedside LP attempted most experienced practitioner available, consider ultrasound guidance to minimize attempts and provide most accurate measurement.
- If patient BMI > 40 may proceed to fluoro without bedside attempt.
- Bedside LP attempt not required if LP shunt or if previously failed bedside attempt(s).

**Decide inpatient vs. outpatient management per ophthalmology (case-by-case decision)**

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OSUWMC Resources

Guidelines

- Treatment of Acute Non-Life-Threatening Headache in the Emergency Department or Inpatient Settings
- Management of Spontaneous Intracerebral Hemorrhage (ICH) / Intraparenchymal Hemorrhage (IPH)
  - Increased Intracranial Pressure (ICP) Management Algorithm
- Management of Aneurysmal Subarachnoid Hemorrhage (SAH)

Ordersets

- OSU IP ED: Headache
- OSU IP ED: CDU/OBS Headache

Patient Education Materials

- Imaging Tests for Headaches-Choosing Wisely
- Pain Management (Krames-OSUMC):
  - Common Myths About Pain Medications
  - Medication for Pain
  - Managing Chronic Pain: Medications
- Lumbar Punctures (Krames-OSUMC):
  - What is a Lumbar Puncture
  - Having a Lumbar Puncture

Quality Measures

- Number of IIH patients treated
  - (% admitted, discharged, placed in observation)
- Percent of IIH patient who receive narcotics in the ED
- Percent of IIH patients with a Neurosurgery and/or Ophthalmology Consult in the ED
- Percent of IIH patients who return to the ED within 30 days
- Percent of IIH patients who receive CT
- Percent of IIH patients who receive LP
- Percent of IIH patients who receive Shuntogram
- Time spent in ED (LOS)

References

- Wall M. Idiopathic Intracranial Hypertension (pseudotumor cerebri). Current Neurology and Neuroscience Reports, 2008; 8: 87-93.

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Guideline Approved

November 29, 2017 Second Edition

Disclaimer: Clinical practice guidelines and algorithms at The Ohio State University Wexner Medical Center (OSUWMC) are standards that are intended to provide general guidance to clinicians. Patient choice and clinician judgment must remain central to the selection of diagnostic tests and therapy. OSUWMC’s guidelines and algorithms are reviewed periodically for consistency with new evidence; however, new developments may not be represented.
### Appendix A. Low-Pressure and High-Pressure Headache: Evaluation and Treatment

<table>
<thead>
<tr>
<th>Headache Type</th>
<th>Common Signs and Symptoms</th>
<th>Treatment Options</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low-Pressure</strong></td>
<td>• Location of pain is posterior cervical</td>
<td>• Fluids and caffeine</td>
</tr>
<tr>
<td></td>
<td>• Feeling of aching or throbbing</td>
<td>• Medicinal options include:</td>
</tr>
<tr>
<td></td>
<td>• Pain is better when patient lies down</td>
<td>- Antiemetics</td>
</tr>
<tr>
<td></td>
<td>• Nausea/vomiting</td>
<td>- Headache cocktails</td>
</tr>
<tr>
<td></td>
<td>• Blurry vision</td>
<td>- If shunt is programmable, consult neurosurgery for shunt change.</td>
</tr>
<tr>
<td><strong>High-Pressure</strong></td>
<td>• All-over headache</td>
<td>• Consult ophthalmology:</td>
</tr>
<tr>
<td></td>
<td>• Headache feels explosive</td>
<td>- Patients with progressing visual loss may require surgical intervention with optic nerve sheath fenestration.</td>
</tr>
<tr>
<td></td>
<td>• Headache is worsened by coughing or sneezing</td>
<td>• While the primary medication of choice is acetazolamide, other options include:</td>
</tr>
<tr>
<td></td>
<td>• Tinnitus</td>
<td>- Furosemide</td>
</tr>
<tr>
<td></td>
<td>• Headache is not improved by lying down</td>
<td>- Topiramate</td>
</tr>
<tr>
<td></td>
<td>• Nausea/vomiting</td>
<td>• Shunt series, if shunt present or if applicable.</td>
</tr>
<tr>
<td></td>
<td>• Transient visual changes</td>
<td>• If shunt is programmable, consult neurosurgery for shunt change.</td>
</tr>
<tr>
<td></td>
<td>• Obscurations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Blurry vision</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Double vision</td>
<td></td>
</tr>
<tr>
<td><strong>All Patients</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regardless of Headache</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pressure Type</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>All</strong></td>
<td>Assign patient to primary care provider if they do not already have one for guidance on:</td>
<td>• Assign patient to primary care provider if they do not already have one for guidance on:</td>
</tr>
<tr>
<td></td>
<td>- Pain management</td>
<td>- Pain management</td>
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<tr>
<td></td>
<td>- Education</td>
<td>- Education</td>
</tr>
<tr>
<td></td>
<td>Provide counseling on steps for improved overall health:</td>
<td>• Provide counseling on steps for improved overall health:</td>
</tr>
<tr>
<td></td>
<td>- Weight loss</td>
<td>- Weight loss</td>
</tr>
<tr>
<td></td>
<td>• Bariatric surgery should be offered only to select patients</td>
<td>• Bariatric surgery should be offered only to select patients</td>
</tr>
<tr>
<td></td>
<td>- Please see OSUW MC surgical management of obesity guideline</td>
<td>- Please see OSUW MC surgical management of obesity guideline</td>
</tr>
<tr>
<td></td>
<td>• Improved nutrition</td>
<td>• Improved nutrition</td>
</tr>
<tr>
<td></td>
<td>• Psychological evaluation</td>
<td>• Psychological evaluation</td>
</tr>
<tr>
<td></td>
<td>• Depression</td>
<td>- Depression</td>
</tr>
<tr>
<td></td>
<td>• Please see OSUW MC management of depression in adults guideline</td>
<td>- Please see OSUW MC management of depression in adults guideline</td>
</tr>
<tr>
<td></td>
<td>- Anxiety</td>
<td>- Anxiety</td>
</tr>
</tbody>
</table>

* See OSUW MC [acute non-life threatening headache guideline](#)
# Appendix B. Dosing Regimens for Treatment of Low-Pressure Headache

<table>
<thead>
<tr>
<th>Headache Type</th>
<th>Medication</th>
<th>Dose</th>
<th>Side Effects</th>
<th>Contraindications and Precautions</th>
</tr>
</thead>
</table>
| Low-Pressure  | Caffeine Citrate    | 480 mg IVPB over 60 minutes. May repeat after 6 hours x 1 | - Angina  
- Palpitations, tachycardia  
- Ventricular arrhythmia  
- Nausea, vomiting  
- Insomnia  
- Dizziness, delirium | - Pheochromocytoma  
- Significant cardiac history  
- History of arrhythmias |
|               | Metoclopramide      | 10 mg IM or IVP over 1 to 2 minutes. May repeat in 8 hours as needed | - Extrapyramidal reactions (give with diphenhydramine or benztropine)  
- Drowsiness, fatigue  
- Insomnia  
- Galactorrhea, amenorrhea  
- Hypotension, hypertension  
- Supraventricular tachycardia, bradycardia  
- Nausea, diarrhea  
- Urinary frequency, incontinence | - Pheochromocytoma  
- Epilepsy  
- Parkinson's disease |
|               | Prochlorperazine     | 10 mg IVP over 2 minutes                   | - Constipation, drymouth  
- Urinary retention  
- Drowsiness  
- Extrapyramidal reactions (give with diphenhydramine or benztropine)  
- Cardiac arrhythmias | - Parkinson's disease  
- Pheochromocytoma  
- Myasthenia gravis |
|               | Valproate Sodium    | 500 mg IVPB over 30 minutes                | - Rash  
- Dizziness  
- Nystagmus  
- Somnolence  
- Tremor  
- Diplopia | - Severe hepatic dysfunction  
- Known hypersensitivity to valproate sodium  
- Pregnancy |
|               | Magnesium Sulfate   | 1-2 grams IVPB over 30 to 60 minutes       | - Flushing, sweating  
- Hypotension  
- Depressed reflexes  
- Flaccid paralysis  
- Circulatory collapse | - Caution in renal insufficiency |
|               | Dexamethasone       | 10 mg IM or IVP over 3 to 5 minutes         | - Fluid and electrolyte disturbances  
- (hypokalemia)  
- Muscle weakness  
- Peptic ulcer  
- Burning or tingling in the perineal area after IV administration  
- Impaired wound healing  
- Convulsions  
- Psychiatric disturbances  
- Hyperglycemia  
- Increased intraocular pressure  
- Hypersensitivity reactions | - |

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### Appendix C. Outpatient Medications for Management of IIH Headaches

<table>
<thead>
<tr>
<th>Headache Type</th>
<th>Medication</th>
<th>Dose</th>
<th>Side Effects</th>
<th>Contraindications and Precautions</th>
</tr>
</thead>
</table>
| High-Pressure | Acetazolamide (Diamox®) | ● 500 mg SR PO BID or 250 mg PO q6h  
● Max daily dose: 2000 mg in divided doses.  
● Increased monitoring is required for dosages above 1000 mg due to risk of renal failure | ● Metabolic acidosis  
● Electrolyte disturbances  
● Taste alteration  
● Tinnitus  
● Polyuria  
● Tingling paresthesia of the fingers and toes, and circumorally, are a near universal side effect.  
● Consider Rx KCL 20mEQ/d for doses above 1gm/d, or if muscle cramps develop. | ● Hyponatremia  
● Hypokalemia  
● Significant kidney or liver disease  
● History of kidney stones |
|               | Furosemide (Lasix®)   | ● 20 mg PO daily or 20 mg PO BID (Max daily dose: 40 mg TID)          | ● Orthostatic hypotension  
● Hyperuricemia  
● Hypokalemia  
● Hypocalcemia  
● Hypokalemia  
● Hypomagnesemia | ● Electrolyte abnormalities |
|               | Topiramate (Topamax®)  | ● 25 mg daily. May increase by 25 mg weekly.  
● (Max daily dose: 200 mg PO administered in two divided doses) | ● Paresthesia  
● Anorexia  
● Somnolence  
● Psychomotor slowing  
● Abnormal vision  
● Difficulty with memory  
● Nausea, diarrhea  
● Kidney stones (if used with other carbonic anhydrase inhibitors) | ● Pregnancy  
● Hepatocellular damage |