Introduction to ENT Imaging

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Disclosure

• No commercial relationships to disclose

Objectives

• Suggest appropriate imaging studies for frequently-encountered clinical scenarios in otolaryngology.

• Identify resources to assist in appropriate selection of imaging studies.

• Compare relative benefits and risks of cross-sectional imaging modalities.
Most important concept

• ACR appropriateness criteria
  – Evidence-based
  – Panels of Clinical and Radiology experts
ACR appropriateness criteria

- Can be integrated into CPOE
  - “Decision support”

- Alternative: call the radiologist

Which modality is best?

- Not always most expensive
  - PET/CT > MR > CT > US

- No plain films
## Choosing a Modality

### MR vs. CT

<table>
<thead>
<tr>
<th>MR</th>
<th>CT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soft tissues</td>
<td>Bones</td>
</tr>
<tr>
<td>Multiplanar</td>
<td>Lower cost</td>
</tr>
<tr>
<td>No radiation</td>
<td>Ubiquitous</td>
</tr>
</tbody>
</table>

## Ultrasound

- Good for thyroid
- Good for superficial nodes
  - Incomplete survey
- Good for image guidance
- Very safe
- Emerging in-office role
  - Specific clinical situations

## PET/CT

- Expensive test
- High-end technology
- Nowadays, always PET/CT, not just PET
- Not all cancers
- Not all situations
When to get a PET/CT

- Known malignancy
  - FDG-avid histopathology
- Staging
- Monitoring
- Surveillance
- Restaging

When NOT to get a PET/CT

- Suspected tumor
  - Undiagnosed neck mass
  - Secondary symptoms
- Small tumors
  - Unlikely to metastasize
- Cured tumors
  - Outside usual recurrence window
- Non-FDG-avid tumors
  - Glandular tumors

Sample scenario: Hearing Loss

- SNHL
  - Contrast-enhanced MR of IACs
  - Cochlear & retrocochlear pathology
  - Specifically, vestibular schwannoma
- CHL
  - Non-contrast CT of temporal bones
  - EAC, TM, ossicles, middle ear
- Mixed
  - Contrast-enhanced CT
  - Specific diagnoses (otosclerosis)
Sample Scenario: Bell’s Palsy

• When to image?
  – Progression after 3 weeks
  – Incomplete recovery at 6 months
  – Recurrent ipsilateral
  – Hyperkinesis
Sample scenario: Dizziness

- Dizziness vs. Vertigo
- ACR criteria: MRI
- Recent literature: no imaging
  - Exception: sudden onset; room spinning
- Usually Meniere’s, BPPD
  - No imaging findings
Sample scenario: Tinnitus

- Pulsatile vs. Continuous
  - Pulsatile ➔ enhanced CT
  - Continuous ➔ MR IAC

- Subjective vs. Objective
Sample scenario: Thyroid nodule

- Discovered clinically
  - Ultrasound to characterize and biopsy
- Discovered incidentally on imaging
  - Depends on size and imaging findings
Sample scenario: Sinusitis

• Acute bacterial sinusitis
  – Benefits from antibiotics

• All other sinusitis
  – Wastes antibiotics

• Distinguishable on CT
  – But is it worth it?
  – Failed treatment
Sample scenario:
Head and Neck Cancer

- No entry in ACR criteria
  - Not a complete list of all clinical scenarios
  - Just most common imaging scenarios
  - Focused on primary care
  - At UPMC, PET/CT used in select circumstances

The art of not ordering tests

- Patient expectations
- Medicolegal threat
- Reduced uncertainty
- Convenience for doctor & patient

- Sweeping changes to the health care system?
“Teach us how to read scans”

“Please condense 12 years of training into a one-hour lecture”

Ice Cream Cone

Stapes
Summary

- Use the ACR Appropriateness Criteria

- Use PET/CT for
  - Documented malignancy
  - FDG-avid types
  - Likely to metastasize

- Not every patient needs a scan