

Salivary and PET Incidentalomas: What to do?

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Disclosures

- None

Learner Objectives

- After this presentation you should:
 - 1) Understand PET technology
 - 2) Appreciate “high” rate of incidentalomas in head and neck
 - 2) Be able to efficiently evaluate incidentalomas
 - 3) Be able to reassure patients that findings may be benign

PET CT Science

- Label glucose with positron-emitting radionucleotides; position then detected by PET scanner
- ^{18}F -2-deoxy-D-glucose (FDG-PET)
- Imaging glucose metabolic rate
- Warburg Effect: enhanced uptake of glucose due to malignant cells due to them having higher rates of aerobic glycolysis

FDG

- FDG acts like glucose but gets trapped in cell when phosphorylated
- Patient with >6 hours fasting, BS < 180
- Given via IV, patient sits quietly 30-60 minutes
- FDG decay products then detected by scanner

Advances in Technology

- Low resolution
- Needs to be fused with CT to be clinically useful
- Sequential information acquired, registered
- Machines smaller, less expensive
- Software advances mid-2000s
- Medicare approval

What else does it measure?

- Variable physiologic uptake, bone marrow activation
- Brown fat
- Inflammatory (especially macrophage and granulomatous)
- Non-iodine avid or poorly differentiated thyroid cancers
- Benign neoplasm

What does it miss?

- Brain, heart, kidney/bladder
- Low grade tumor
- Neuroendocrine tumors
- Many salivary tumors
- Well-differentiated thyroid cancers
- Anything in hyperglycemia and hyperinsulinemia states

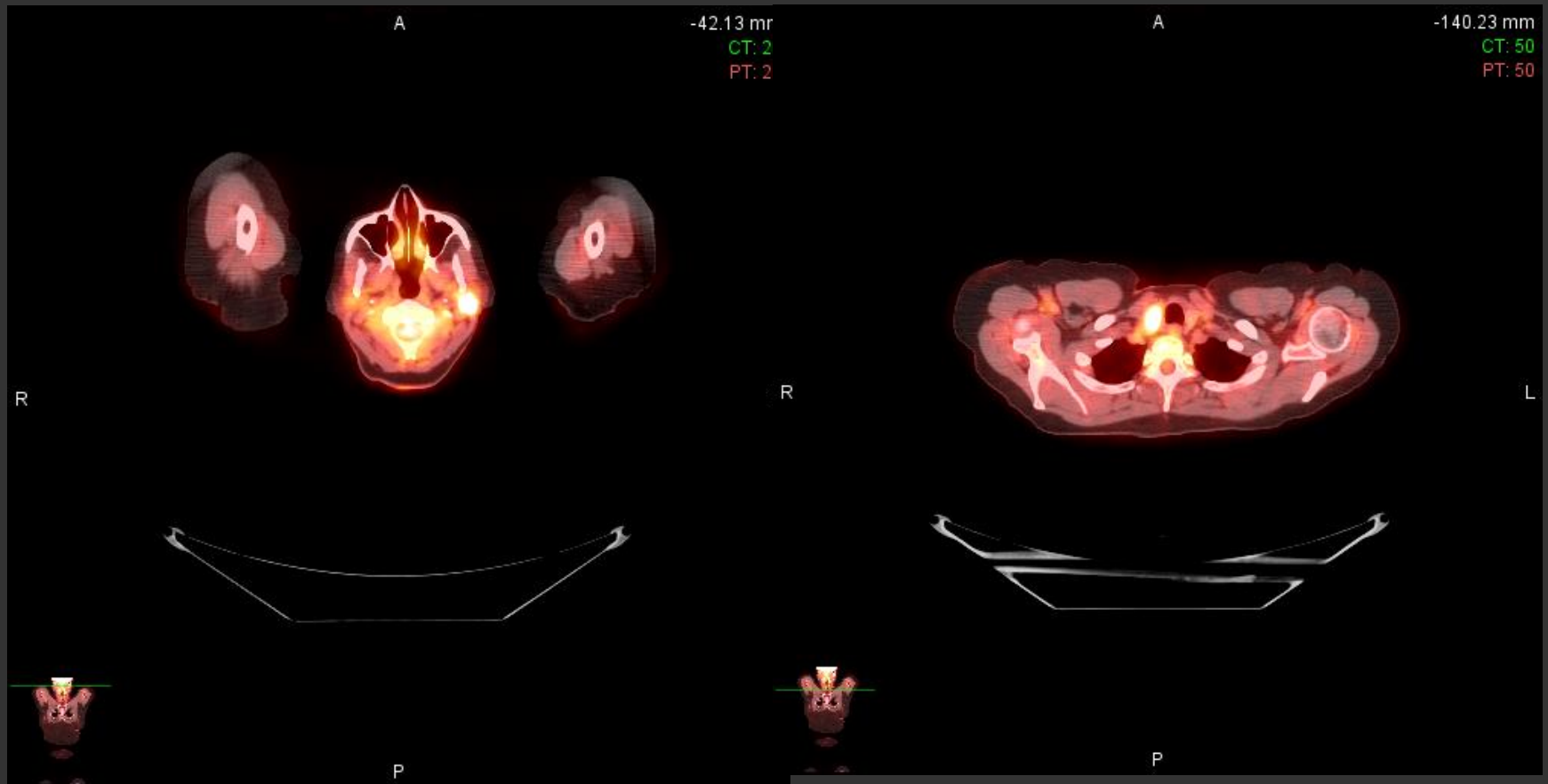
Volume Considerations

- 2006: National Oncologic PET Registry
- 2009: Expanded Medicare coverage
- 2013: Max 3 follow-up PET CT limit
- 2018: 2,086,000 clinical PET CT
 - 7% increase

PET Incidentaloma

- Dependent on indication for PET
 - Lung, colorectal and lymphoma
- In general, higher rate of HN incidentalomas on PET for HNC

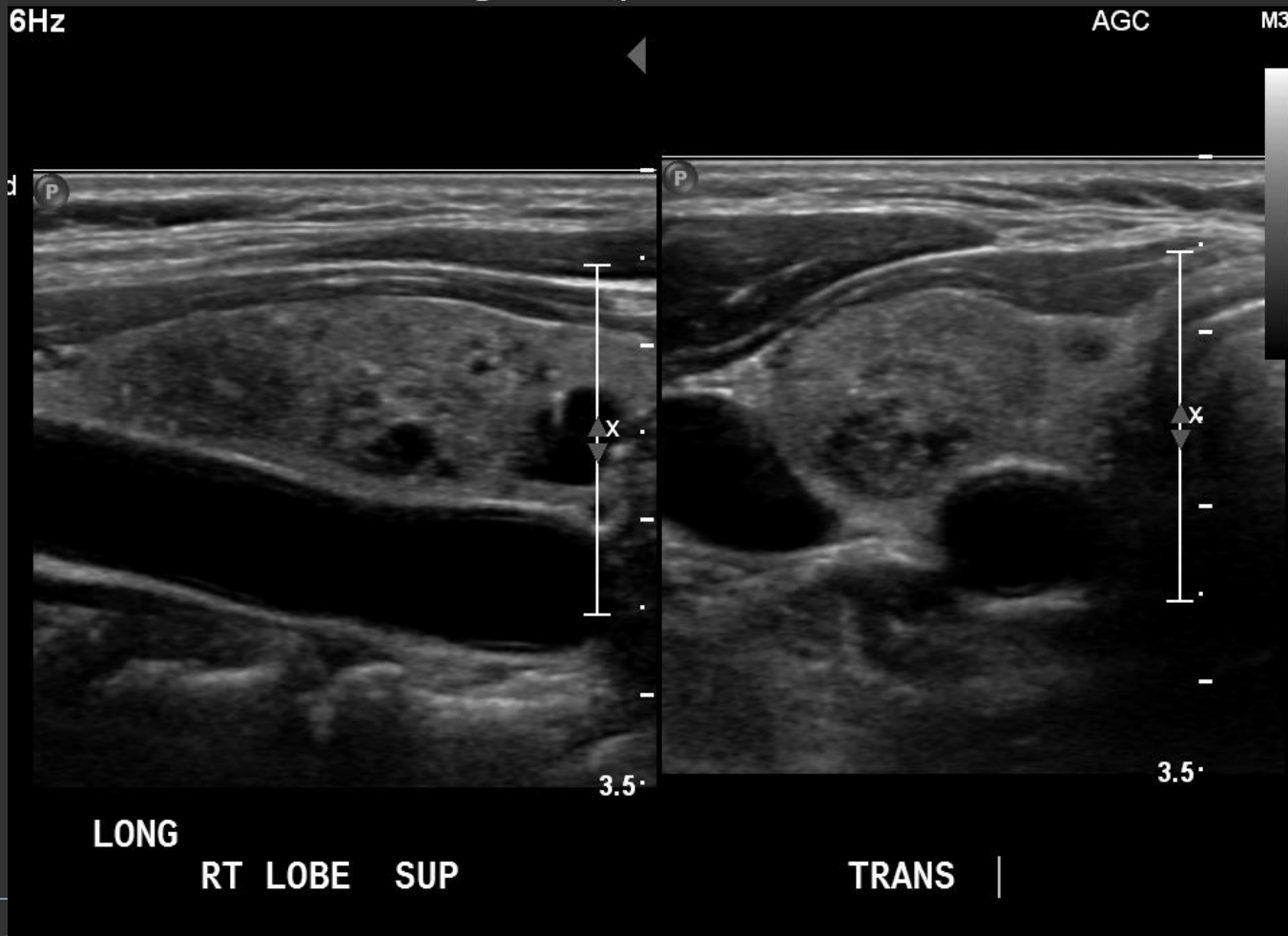
PET CT for lung nodules



Thyroid Incidentaloma

- 2.5% PET CT with thyroid incidentaloma
- 30-40% thyroid cancer
- Who will benefit from further evaluation and treatment is unclear
- Oncocytic/Hurthle cell neoplasms
mitochondrial defect drives inefficient metabolism (benign or malignant)
- Degree of PET uptake (SUV) not helpful

US Thyroid



ATA Recommendation

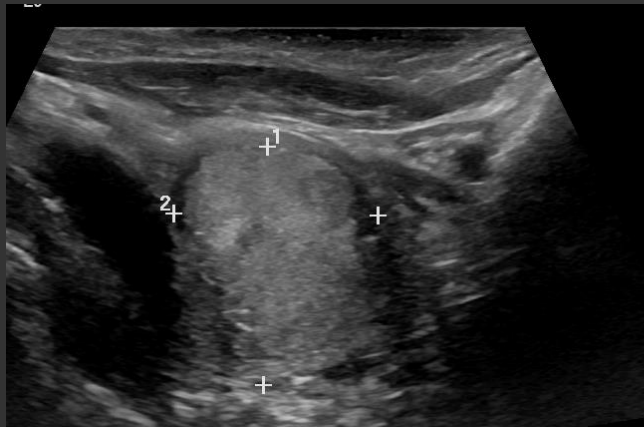
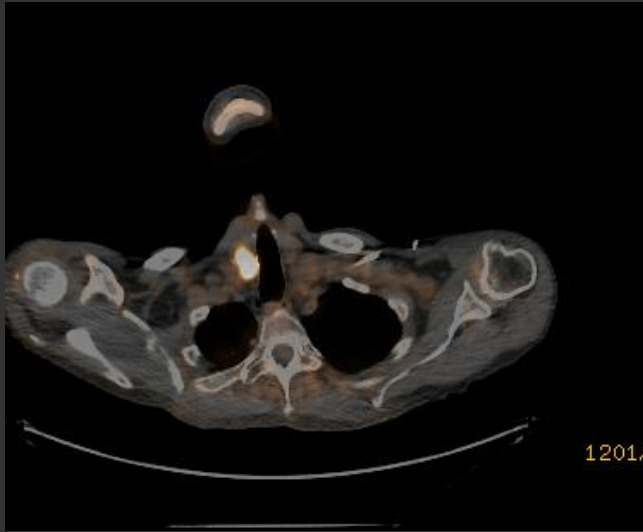
RECOMMENDATION 5:

FDG avid nodules >1 cm should have US and FNA.

Strong recommendation, Moderate Quality Evidence

Risk of malignancy in thyroid incidentalomas detected by 18F-fluorodeoxyglucose positron emission tomography: a systematic review. *Thyroid* 22:918–925

73 yo man with refractory myeloma

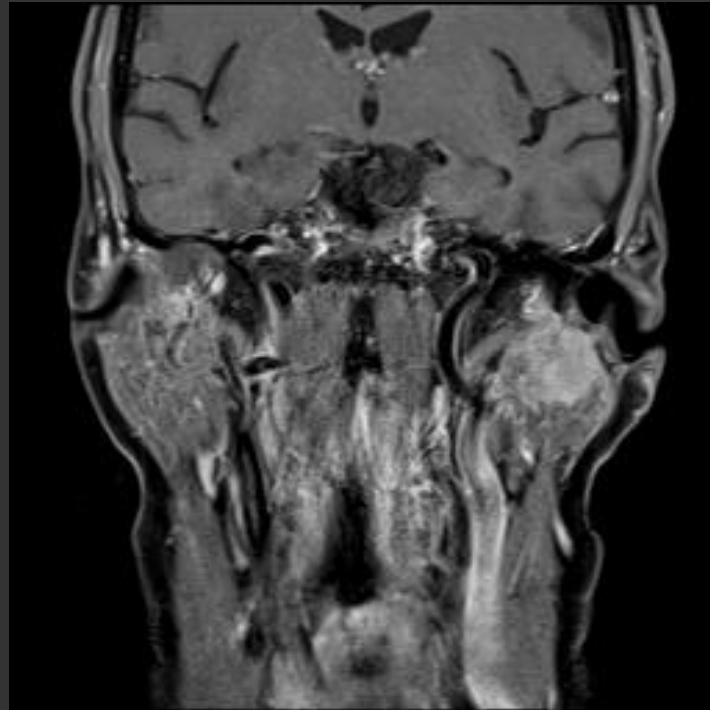
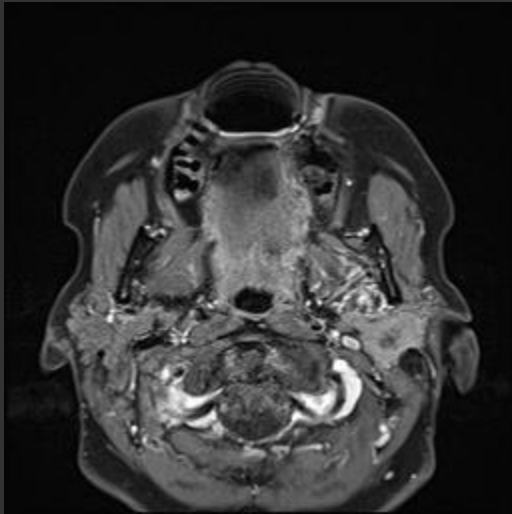


Salivary Incidentaloma

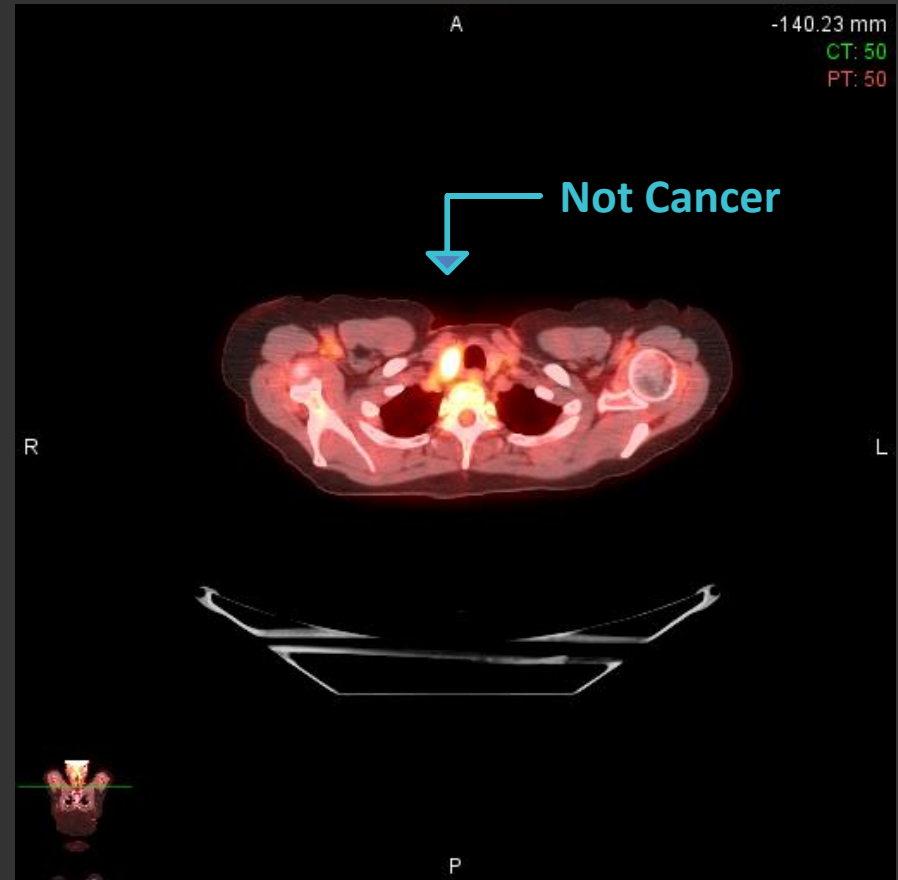
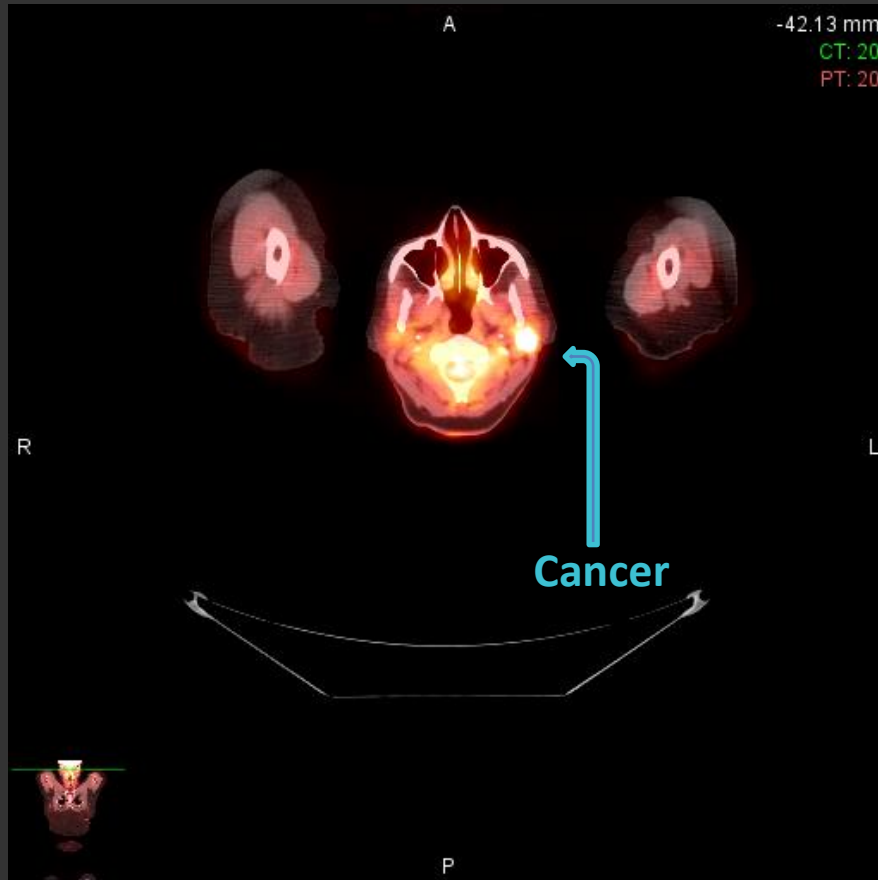
- Head and Neck indication: 2%
- Non-Head and Neck indication: <1%
- Rate of malignancy ~30%
- SUV unable to differentiate between benign and malignant

Incidental focal FDG uptake in the parotid glands on PET/CT in patients with head and neck malignancy
2015 Jan;25(1):171-7. doi: 10.1007/s00330-014-3397-1. Epub 2014 Sep 3

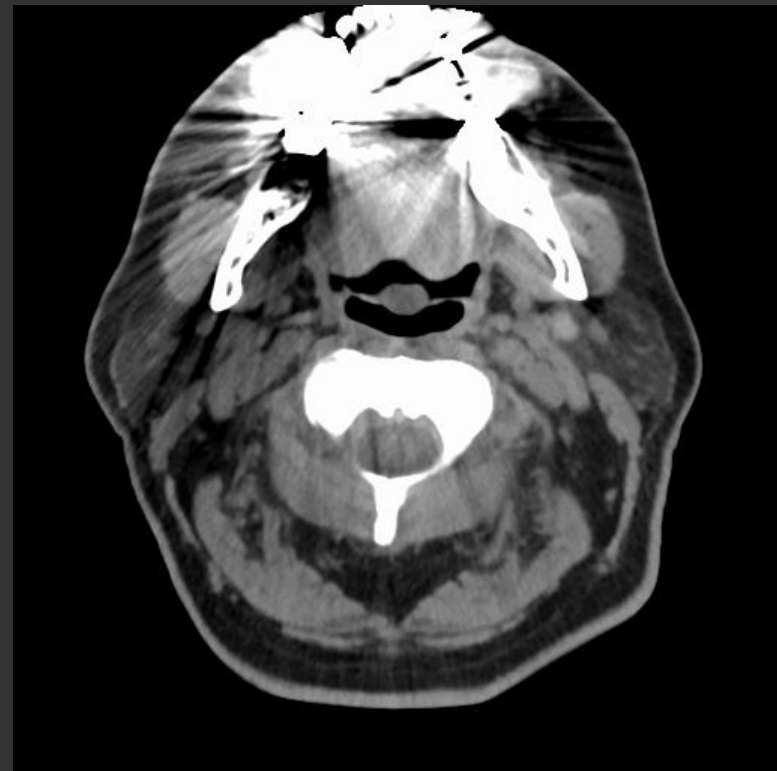
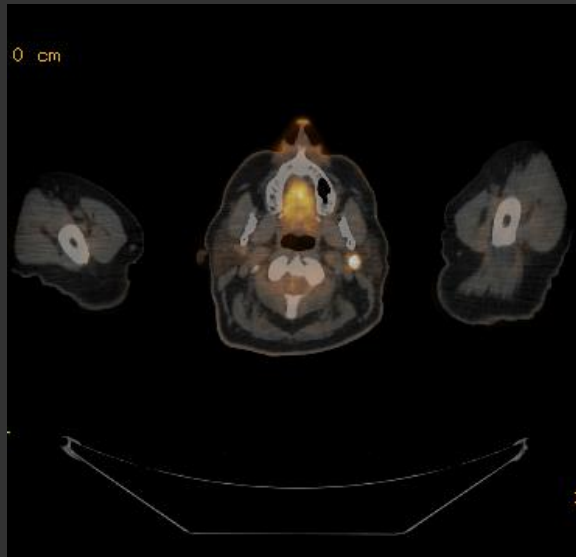
MRI with Ill-defined mass



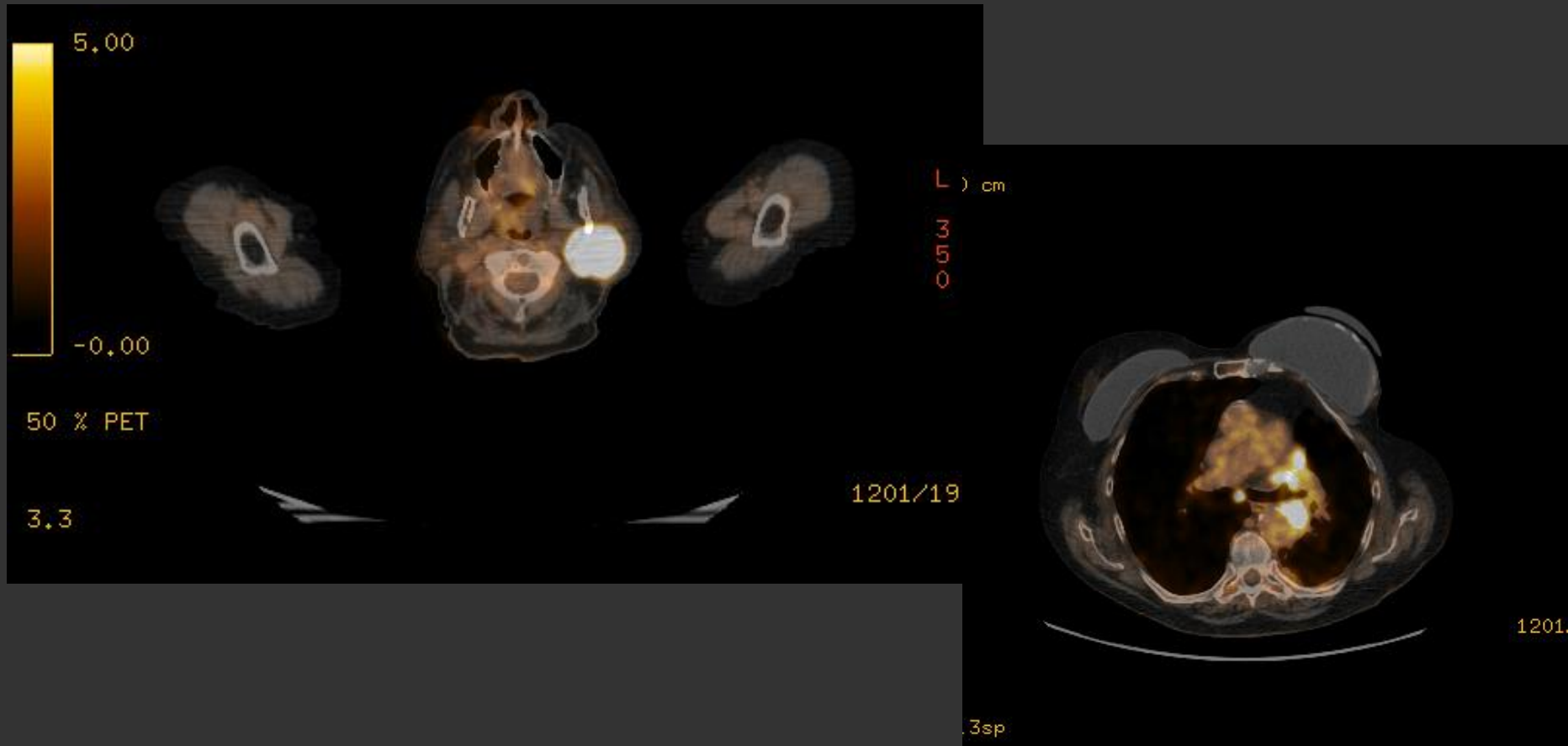
PET CT for lung nodules



PET Incidentaloma mimic metastatic disease



85 with recurrent lung cancer



Summary

- Do
 - Explain to patients how PET scans work
 - Workup incidentalomas with diagnostic imaging and FNA when appropriate
 - Reassure patients that most incidentaloma are benign
 - See if incidentaloma present on old imaging

Summary

- Do not:
 - Forget to take the underlying diagnosis into consideration
 - Assume incidentaloma are benign
 - Make assumptions base on avidity