

# **$^{68}\text{Ga}$ -Octreotate Trial Sherbrooke, Quebec**

**Eric Turcotte, MD, FRCPC**

**Spécialiste en médecine nucléaire, CIUSSS de l'Estrie**

**Professeur agrégé, Université de Sherbrooke**

**Chef recherche clinique du Centre d'Imagerie Moléculaire de Sherbrooke**

**Département de Médecine Nucléaire et radiobiologie**

**Centre d'imagerie moléculaire de Sherbrooke**

**Faculté de médecine et sciences de la santé**

**Université de Sherbrooke**



# Sherbrooke's trial

- Phase II Study to Measure the Safety of  $^{68}\text{Ga}$ -DOTA-TATE PET/CT in the Diagnosis of Tumors Expressing Somatostatin Receptors
- Recruiting since June 16<sup>th</sup> 2016
  - Open label CTA
  - Patients to recruit: undetermined
  - To date: 156 patients (9 months)



# Inclusion criteria

- **Any patient, pediatric or adult, with proven or suspected SSTR (2) expressing tumor**
  - **Known or suspected lesion expressing somatostatin receptor**
    - **NET: G1-G2**
    - **Octreoscan or FDG suspected as falsely-negative**
  - **Follow-up with an elevated marker**
  - **Measure response to treatment**
  - **Before PRRT**



# Accepted tumor types

## Not limited to this list

- **NET:**
  - **Gastro-intestinal**
  - **Pancreatic**
    - **Insulinoma, Glucagonoma...**
  - **Bronchus**
  - **Pulmonary small cells**
  - **Thyroid medullary carcinoma**
  - **Merkel (skin)**
- **Pheochromocytoma**
- **Paraganglioma**
- **Meningioma**
- **Enthesioneuroblastoma**
- **Oncogenic osteomalacia**
- **Iodine negative well differentiated thyroid cancer**
- **Neuroblastoma**
- **Medulloblastoma**
- **Other tumors:**
  - **Breast**
  - **Lymphoma**
  - **Hypernephroma**
  - **Hepatoma**
  - **Pituitary adenoma**
  - **Ectopic ACTH tumor**



# Exclusion criteria

- **Patient refusal to participate (2%)**
- **Claustrophobia**
- **Allergic reaction to Octreotate**
- **Pregnancy (0.5%)**



# Main objectives

- **Measure the safety of  $^{68}\text{Ga}$  Gallium Octreotate produced in Sherbrooke**
  - Up to 24 hours post IV
  - Adverse events registry
- **Produce diagnostic imaging and interpretation**
- **Sub-objectives:**
  - Image optimisation
  - Medical indications monitoring

# Funding

- **Quebec: All patients are covered under the general Quebec Health Insurance**
- **Ontario: Agreement with CCO**
  - CCO approves scans
- **Other provinces: Case by case approval**



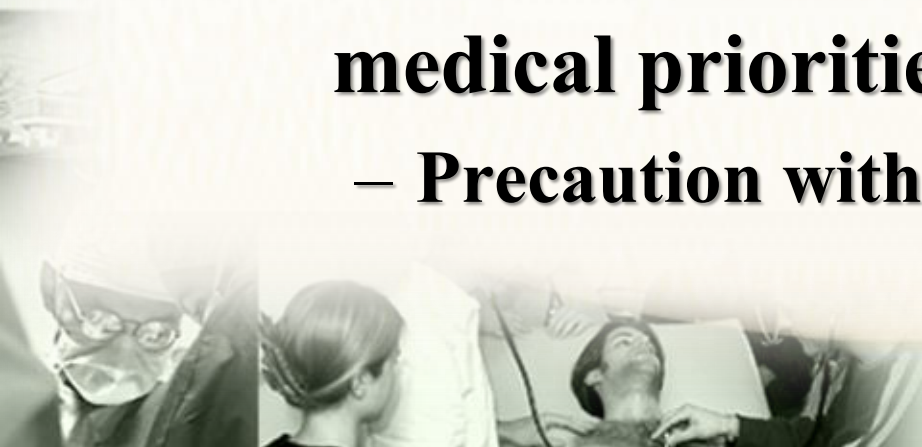
# How to get access to Octreotate

- **Confirm that the patient could benefit from  $^{68}\text{Ga}$ -Octreotate**
- **Advise patients and seek approval to receive a call from CHUS research team**
  - **Ontario: Fill CCO form «PETscan network»**
  - **Quebec: Fill CHUS PET request form**
  - **FAX: 819-820-6490**
  - **Email: [helena.senta@usherbrooke.ca](mailto:helena.senta@usherbrooke.ca)**



# Access to Octreotate

- **CHUS research team will contact the patient to explain the study**
- **Consent formed mailed (or emailed)**
  - Patient accepts verbally
- **Exam is scheduled according to medical priorities**
  - Precaution with somatostatin medication



# Day of scan

- **No fasting required**
- **Consent form signature**
- **Octreotate i.v. injection**
  - 1-5 mCi
- **Waiting time: 60-90 minutes**
- **Scanning time: adapted to the injected dose**



# Collected data

- **Protected for 25 years**
  - **Images and clinical report**
  - **Retrospective sub-studies allowed**

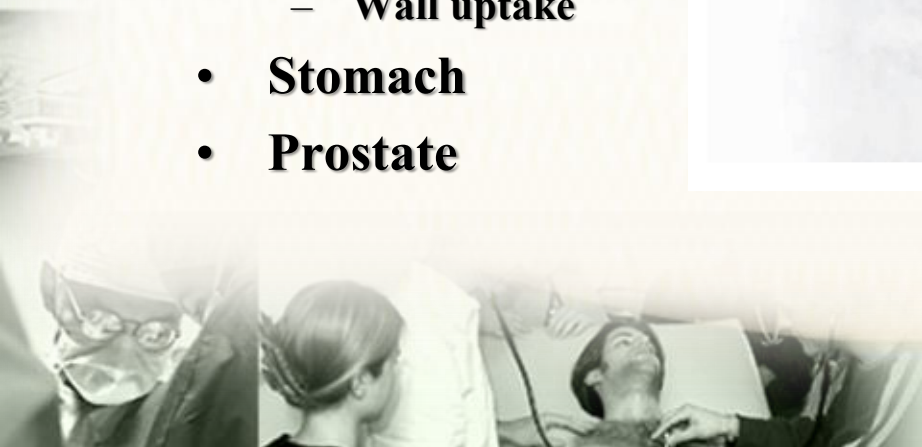
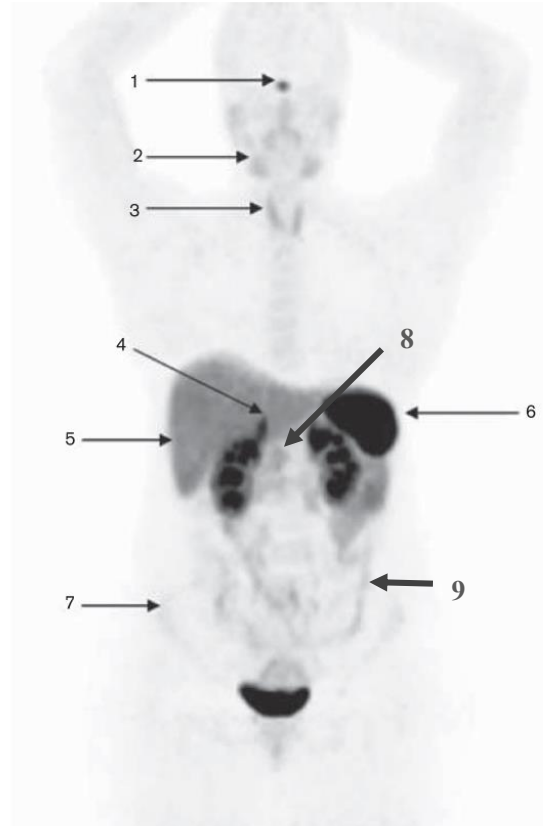


# NORMAL DISTRIBUTION



# Interpretation: The learning curve

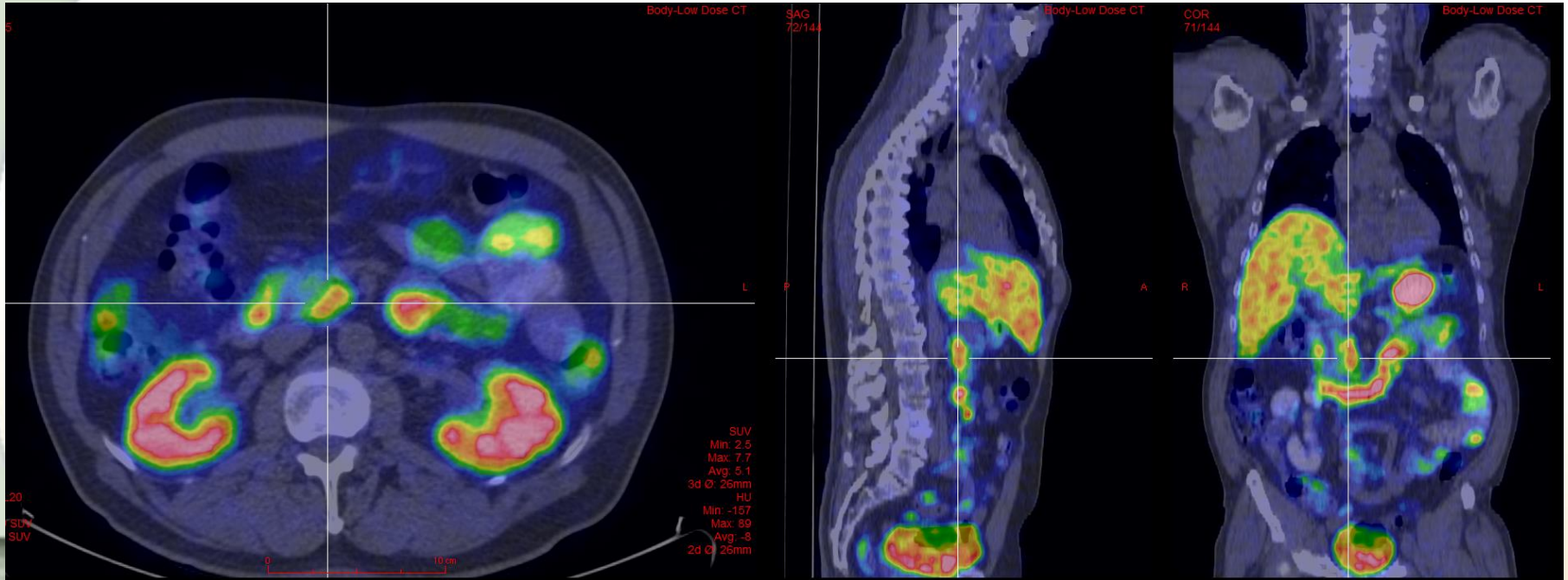
1. Pituitary gland
  2. Salivary glands
  3. Thyroid gland
  4. Adrenal glands
  5. Liver
  6. Spleen
  7. Bone marrow
  8. Uncinate process
  9. Small bowel
    - Wall uptake
- Stomach
  - Prostate



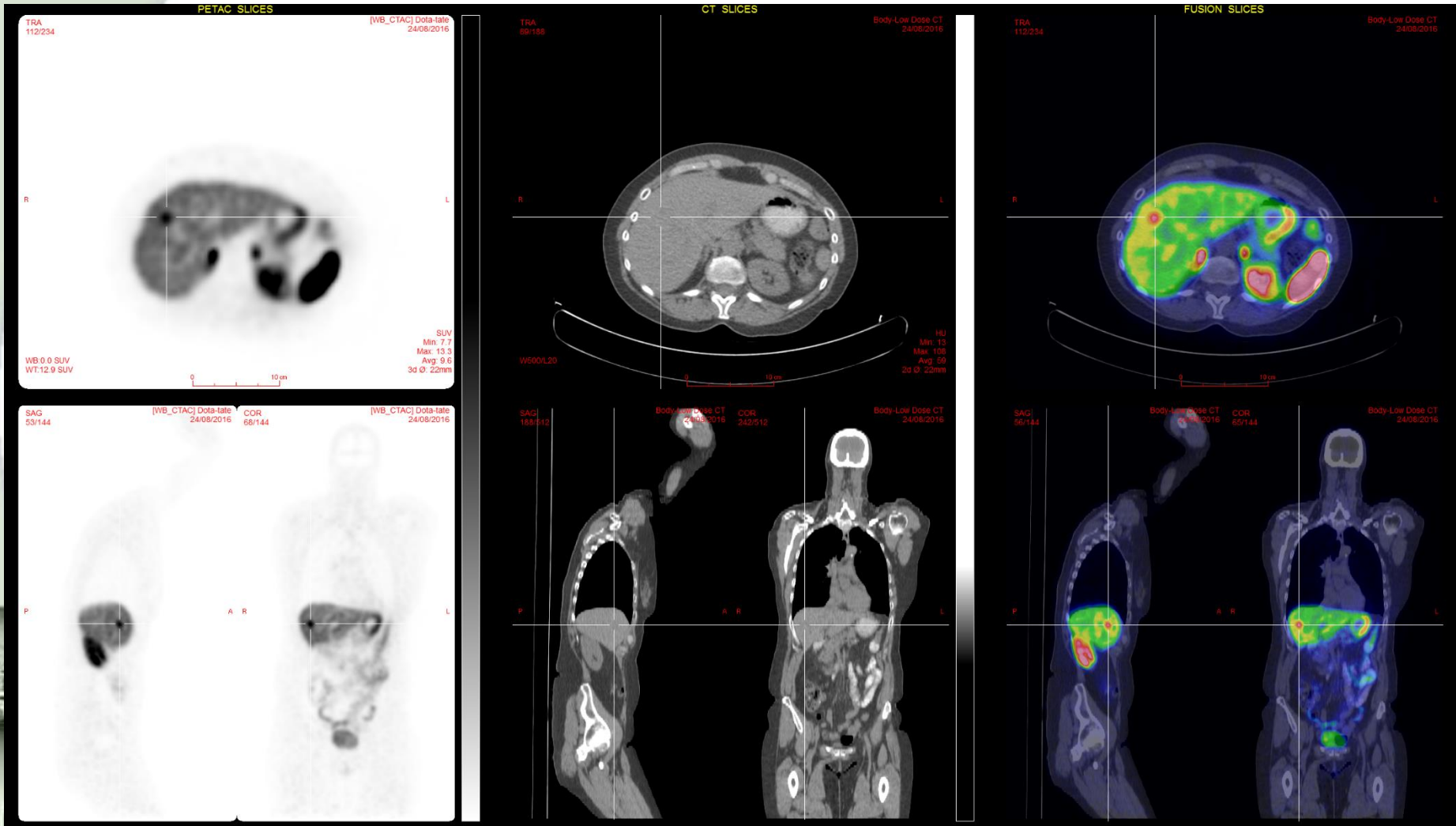
# PITFALLS



# Uncinate process (33%)

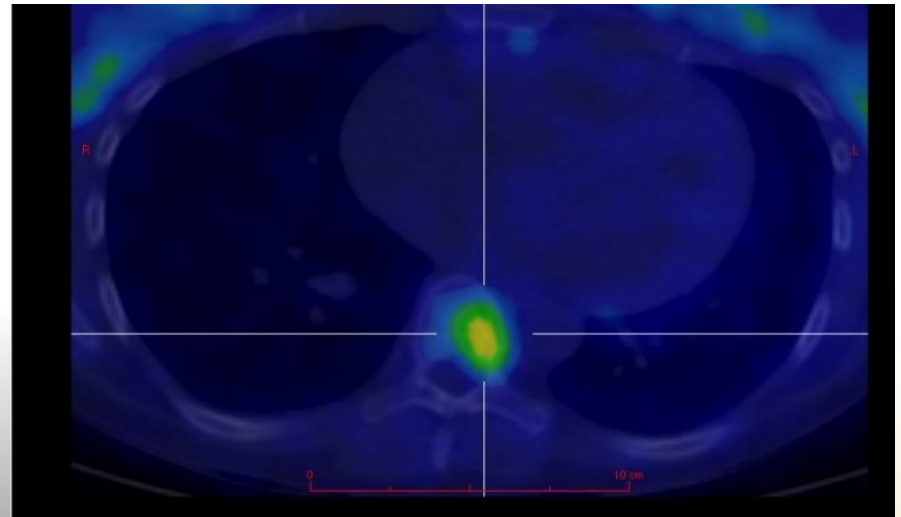
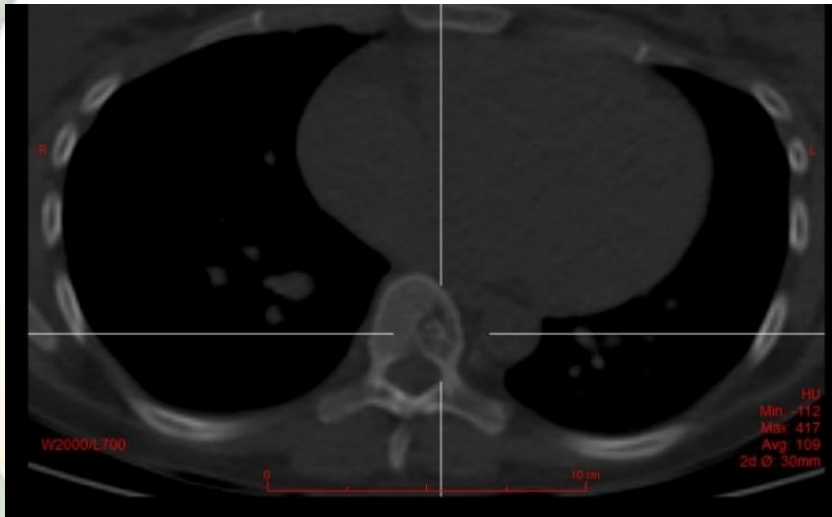


# Liver hemangioma

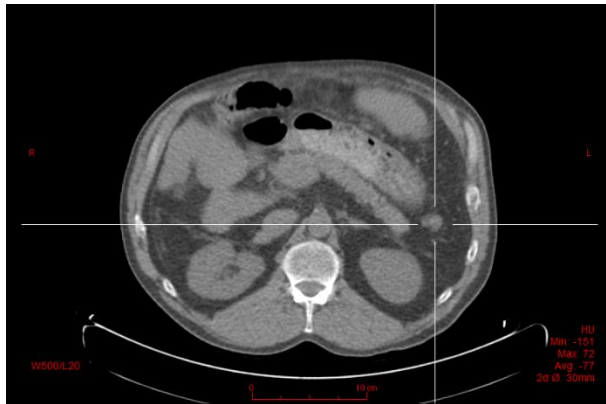
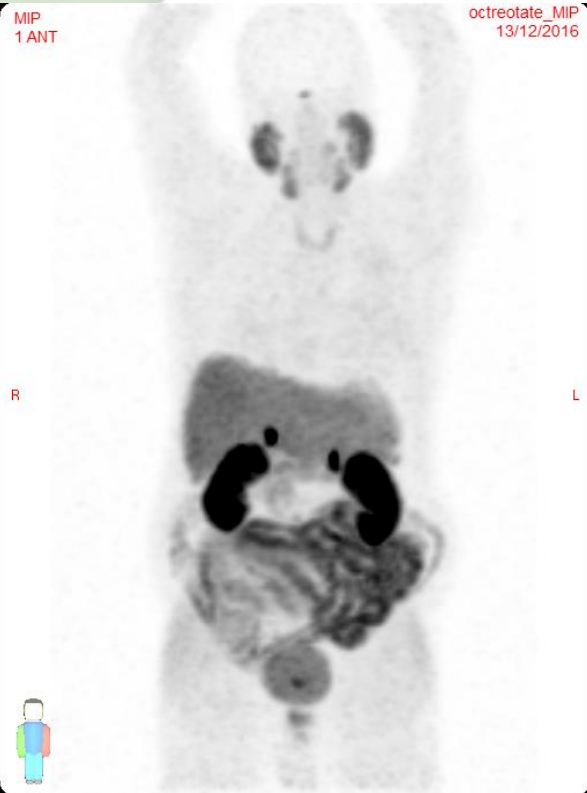




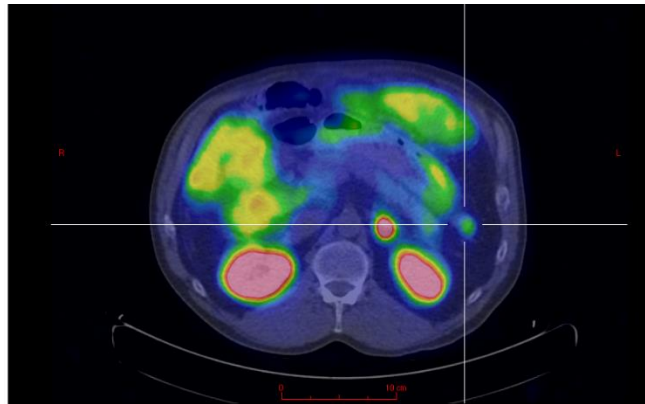
# Bone hemangioma



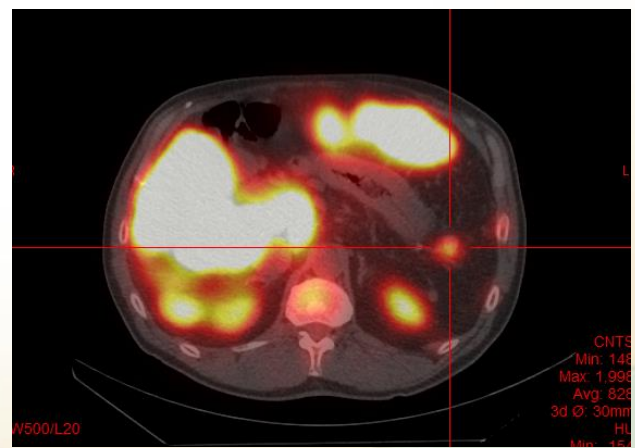
# Splenosis



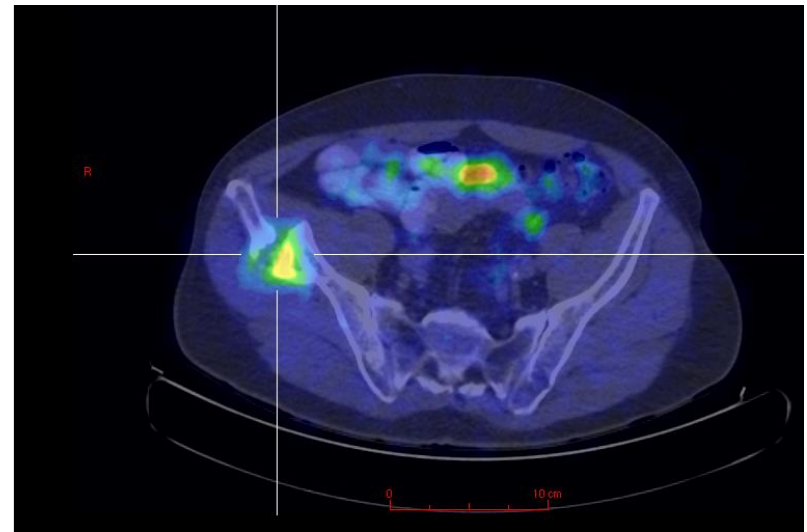
Liver SUV 3,6



Splenosis SUV 3,4



# Fracture



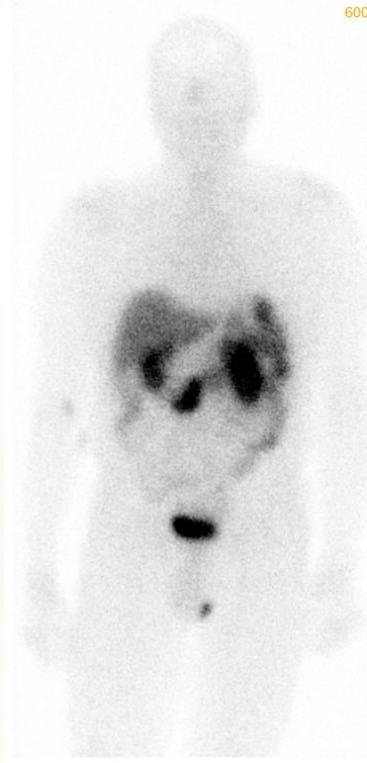
**Liver SUV 8.1, Fracture SUV 3.9**



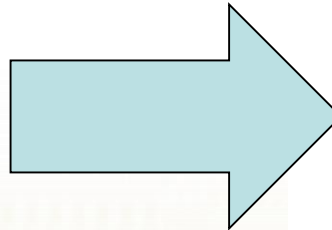
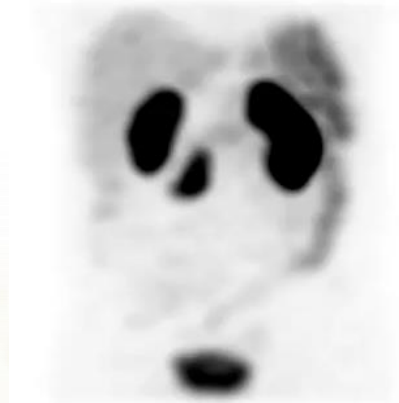
# CLINICAL CASES



# $^{68}\text{Ga}$ -OctreoTATE



$^{111}\text{In}$ -Octreoscan



$^{68}\text{Ga}$ -DOTA-TATE

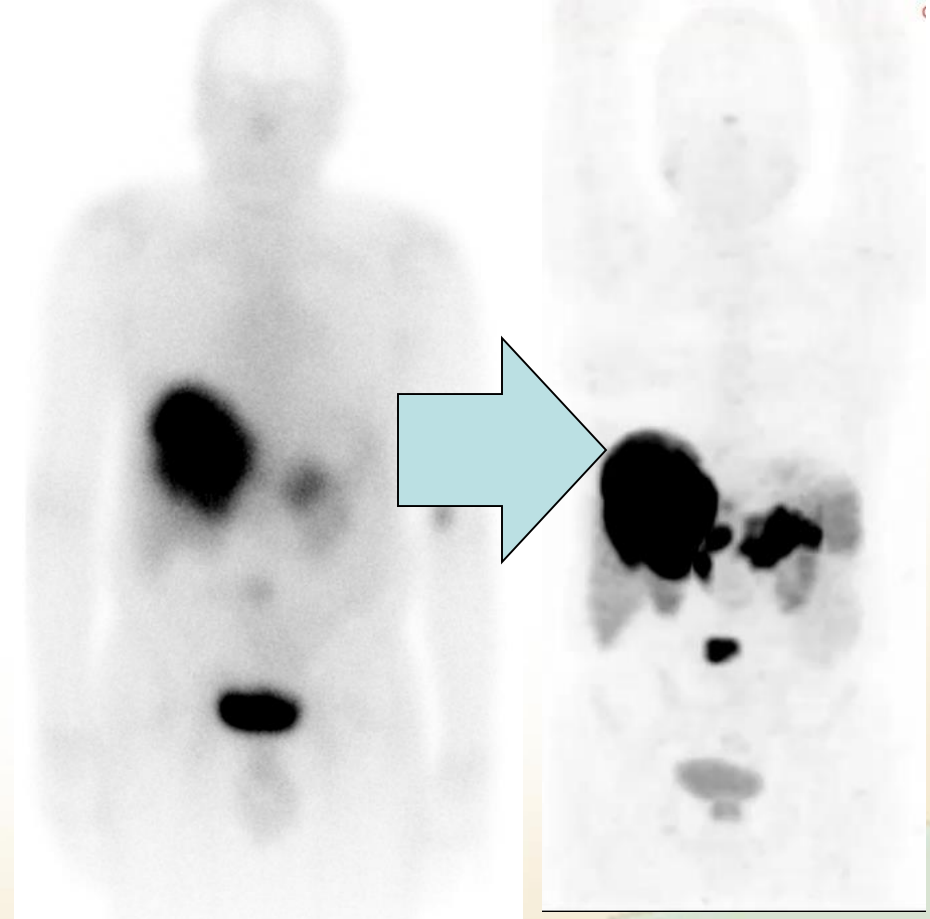
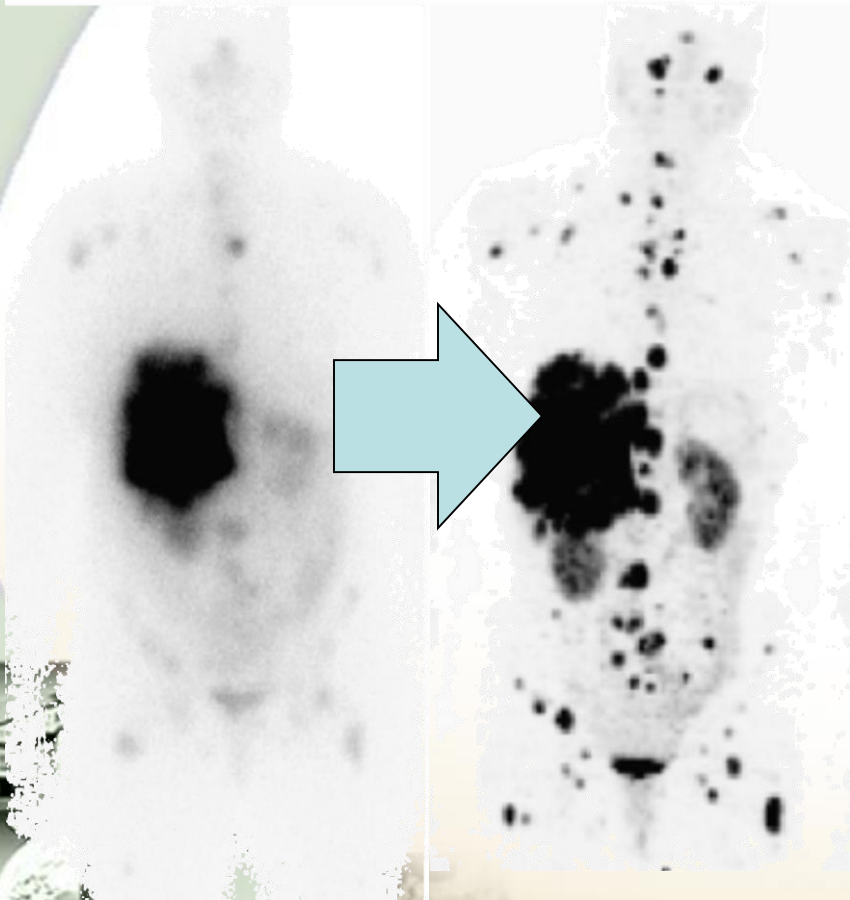
# Spectacular images

**Octreoscan**

**PET**

**Octreoscan**

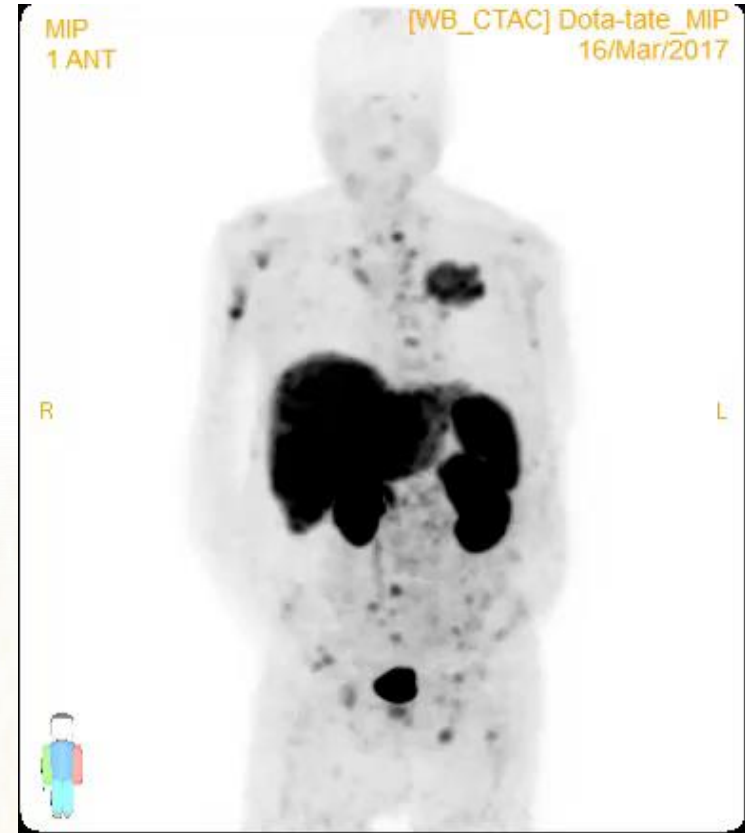
**PET**



# 1mCi – 4mCi



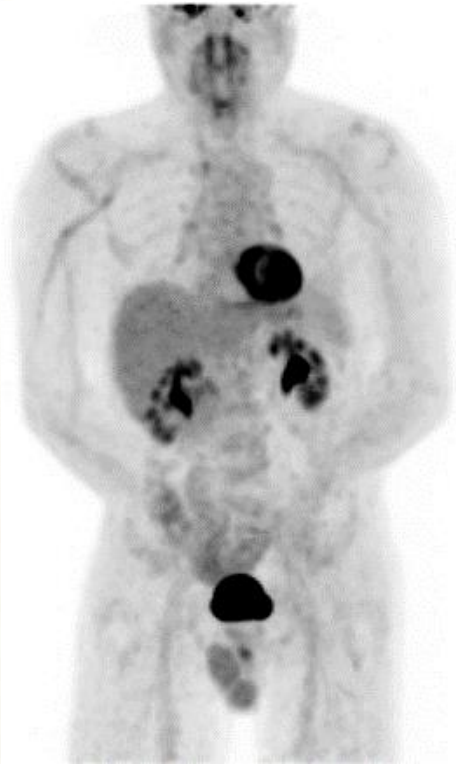
**1mCi – more noise**



**4 mCi**

# FDG versus Octreotate

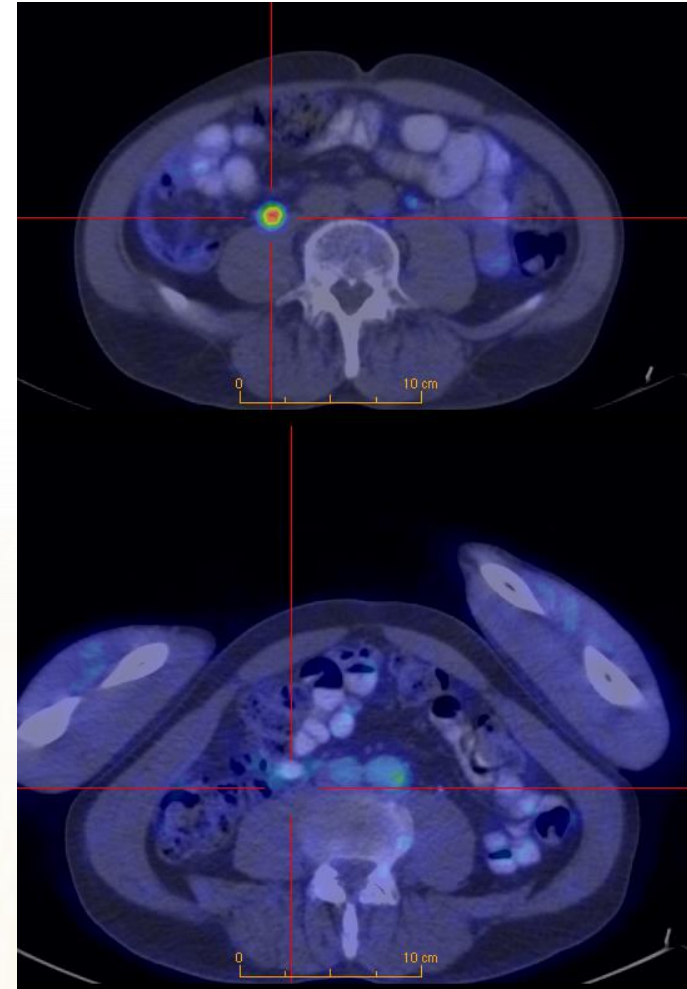
## Flip-flop phenomenon



**FDG**



**Octreotate**

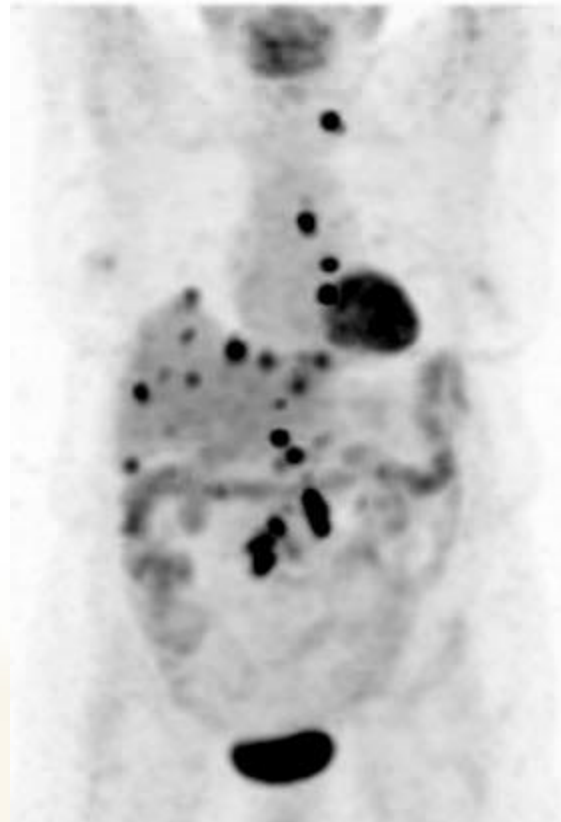




# Flip-flop phenomenon



**Octreoscan**



**FDG**

**Undifferentiated NET**

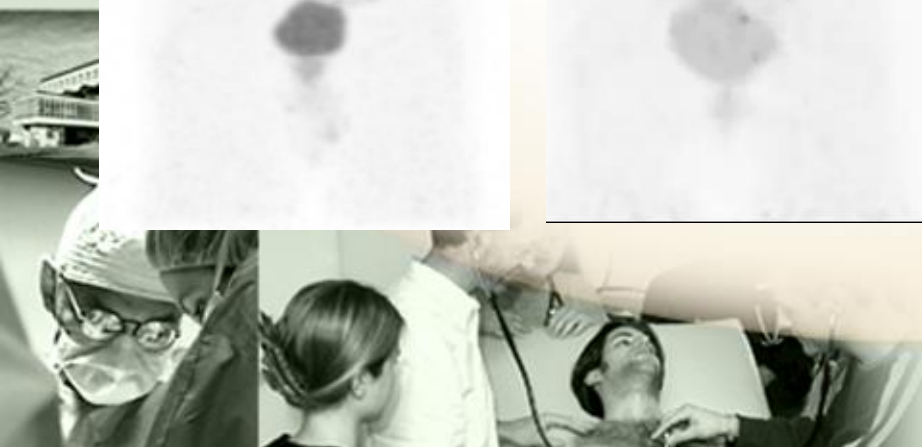
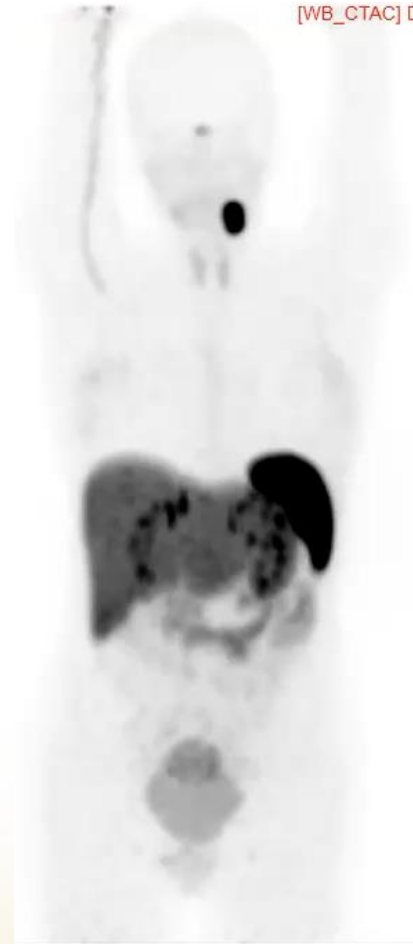
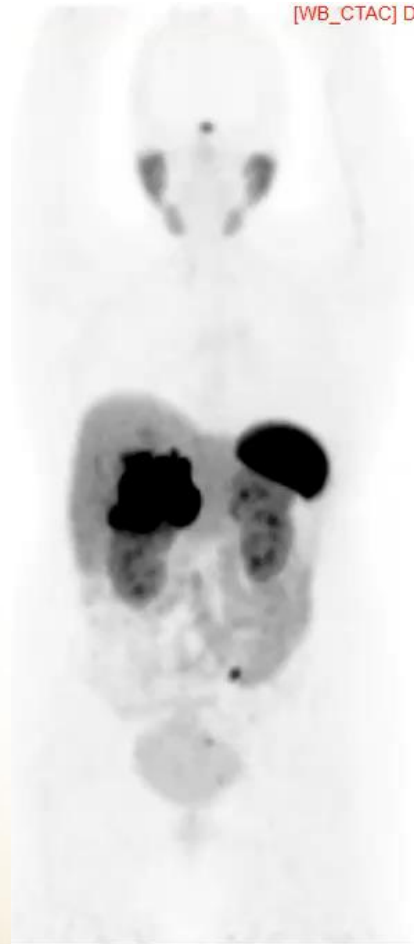
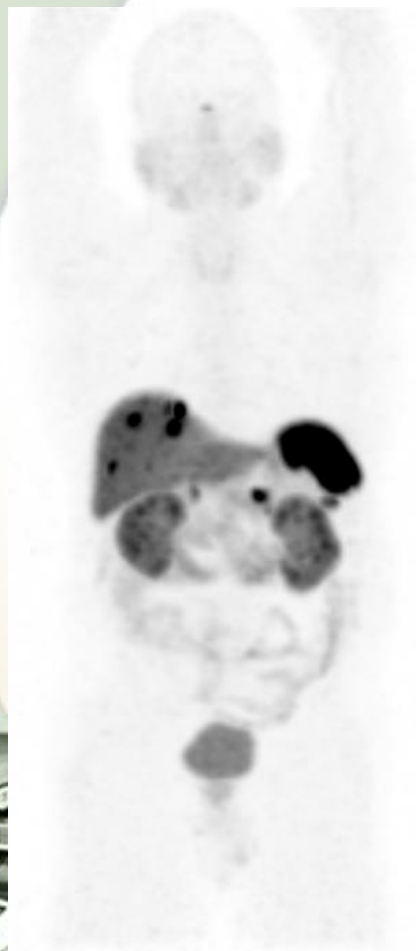
- **Predictive of a rapidly growing disease**
  - **PPV 93% at 6 months**

## Pancreatic NET

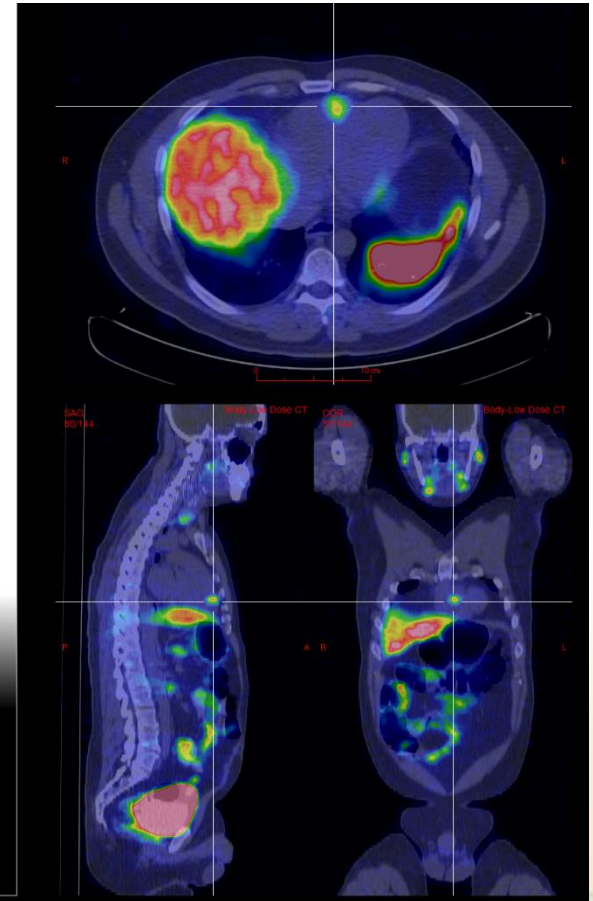
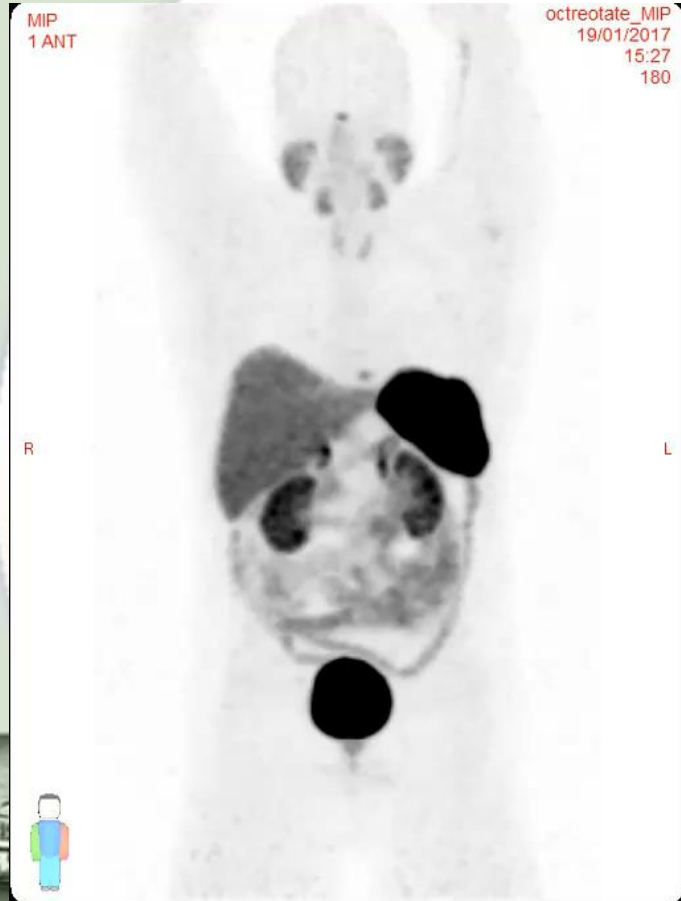
## Pheochromocytoma

## Paraganglioma

## Meningioma

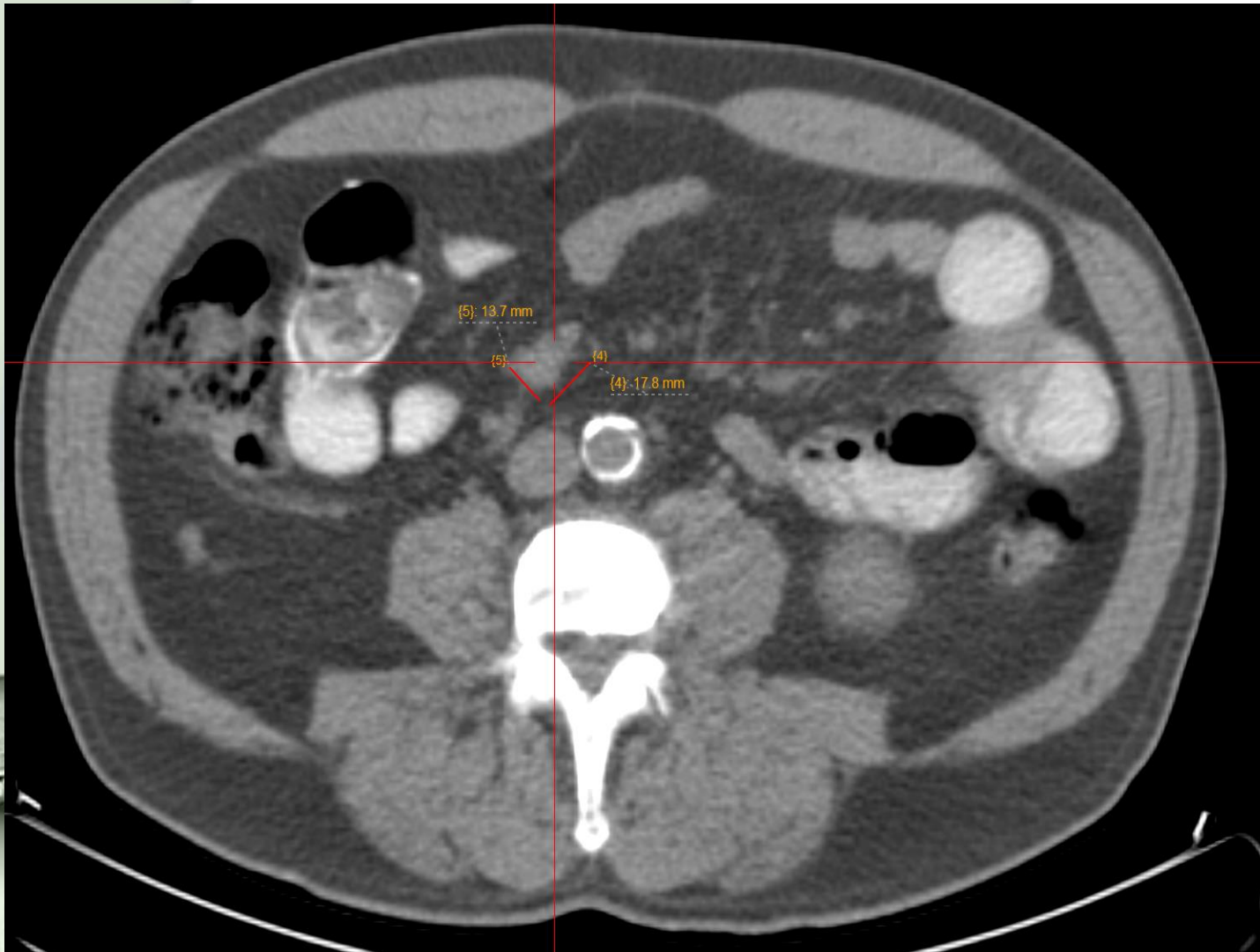


# Cardiac metastasis



# Impact on therapy

Therapeutic change in > 40% of cases



56 y. old male

Small bowel NET

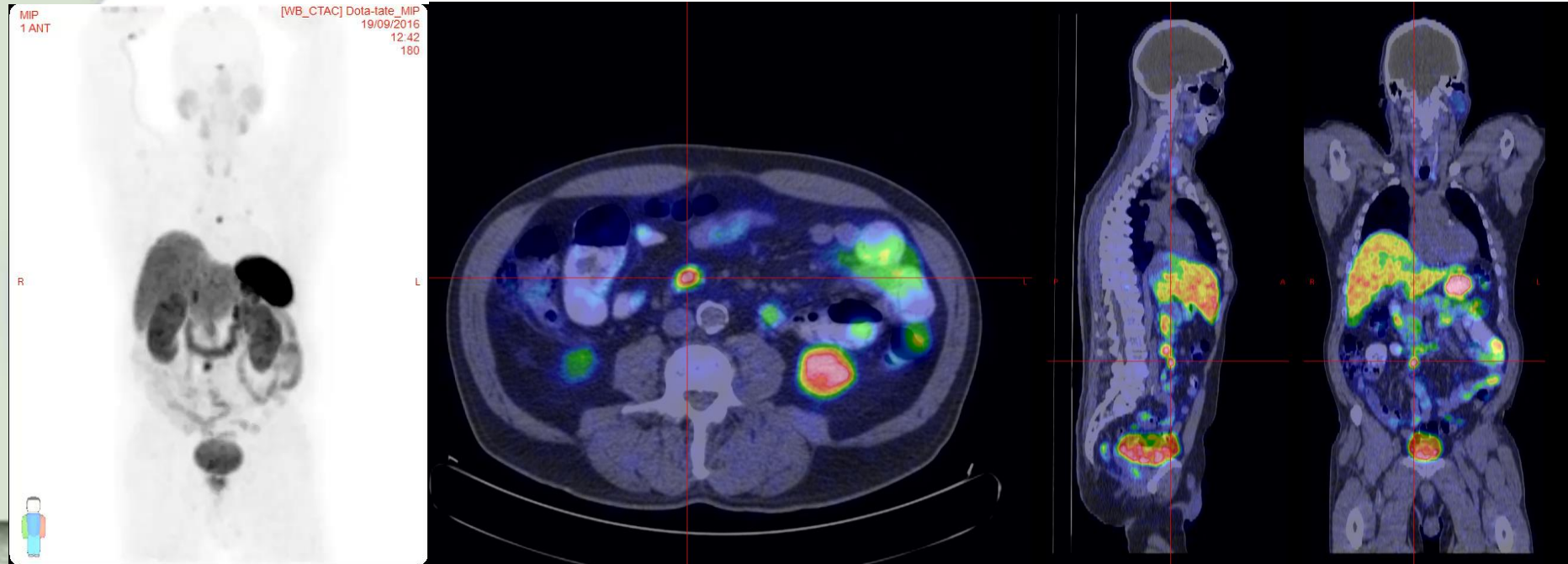
Followed by CT:  
Slowly growing  
lesion at the root  
of the mesentery

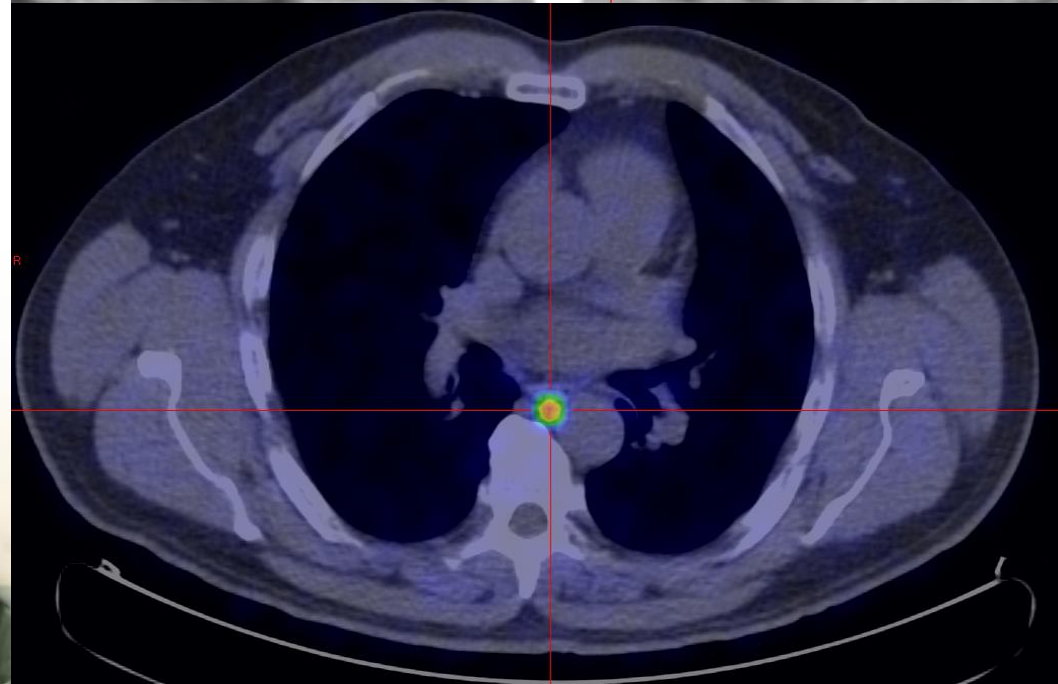
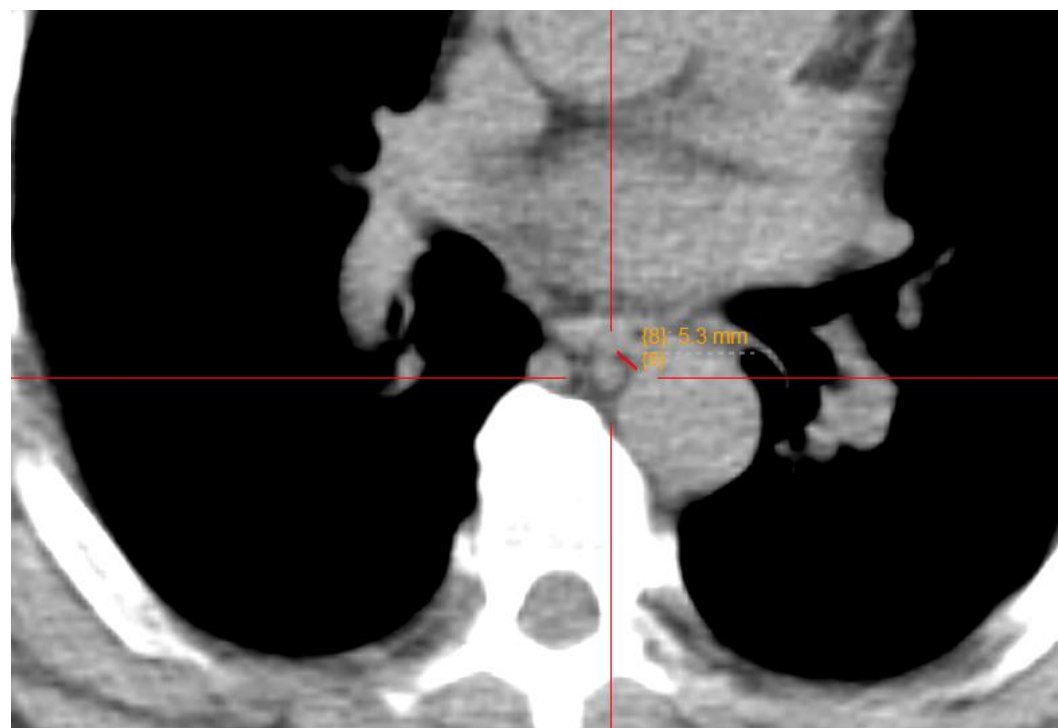


UNIVERSITÉ DE  
SHERBROOKE

Faculté de médecine  
et des sciences de la santé

# Impact on therapy





# Next step

- **Include Quebec City in the protocol as a second production site of  $^{68}\text{Ga}$ -Octreotate – this summer**
- **To access Octreotate, contact:**
  - **[Helena.senta@usherbrooke.ca](mailto:Helena.senta@usherbrooke.ca)**
  - **FAX: 819-820-6490**