THE UNIVERSITY OF CHICAGO MEDICINE & BIOLOGICAL SCIENCES

# Medical Imaging in Clinical Trials:

## Long-Term Follow-Up: Common Nuclear Medicine Problems!

Nick Gruszauskas, Ph.D.

Technical Director, HIRO

Last Revision: 11-Mar-2021

# Common Nuc Med and PET Issues



- Over the past few months, we have identified a few common recurring issues related to **nuclear medicine bone scans** and **PET scans**.
- In the following slides, we will discuss the details of these issues and how to resolve them.
- These issues impact clinical trials of all types and from all sections, so please keep an eye out for any trials you coordinate!

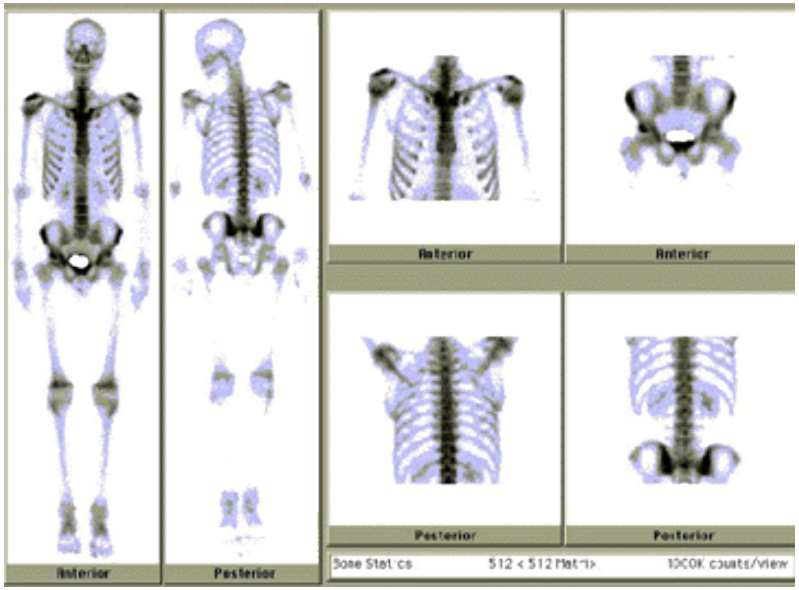
## Nuclear Medicine Bone Scans

- The routine clinical bone scan parameters used by **UCM** generally meet the typical guidelines required by most clinical trials.
- Bone scans performed at **outside hospitals**, however, often generate queries about acquisition or data type.
- The most common queries for outside hospital bone scans are **missing raw data** and **compressed images**.

# Nuclear Medicine Bone Scans



- It is not uncommon for an outside hospital to only include a “summary screen capture” when a patient requests a copy of their bone scan.
  - Some hospitals only retain summary images in their archives.
- Outside hospitals will also often provide bone scan images in a compressed format.

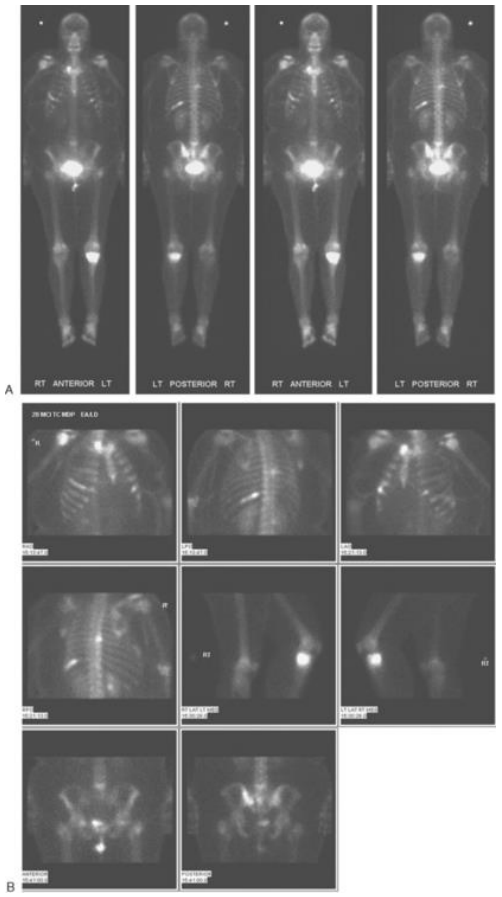



Example of a bone scan summary screen capture image

# Nuclear Medicine Bone Scans



- Most clinical trials require the original planar scintigraphy images from the bone scan, not just the summary image. This is the original image data that was used to generate the summary image.
- Core labs will usually query scans that do not contain **both** the planar images ***and*** summary image as incomplete.




Example of a full bone scan with all planar whole body images and spot images

# Nuclear Medicine Bone Scans



- Core labs will also query almost any scan with images that use a compressed format.
- When requesting copies of nuclear medicine bone scans from outside hospitals, it is best to provide the following instructions to avoid queries:

1. **The images should be provided in uncompressed DICOM format.**
2. **The copy should include the original planar whole body images and spot images (if available) along with the summary screen capture image.**

## PET Scans

- The routine clinical PET parameters used by UCM often meet the typical guidelines required by most clinical trials, but there are some important exceptions:
  - ❖PET/CT scan diagnostic quality
  - ❖Routine UCM uptake time
  - ❖Mobile PET scanner vs. fixed PET scanner

# PET Scans

- **PET/CT Scan Diagnostic Quality**
  - Most of the PET scans performed at UCM are **PET/CT** scans: A basic CT scan is performed with the PET scan, and the images are fused together. The CT images are also used for image processing (attenuation correction).
  - The CT scan portion of our PET/CT scans is **non-diagnostic**. This means the quality is not high enough for a radiologist to perform a formal interpretation.
  - If your trial requires a *diagnostic-quality* (i.e., routine) CT scan during a PET scan visit, you *cannot* use the CT portion of the PET scan to meet this requirement.
  - **You will need to order a separate CT scan of the desired anatomy.**

# PET Scans

- **Routine UCM Uptake Time**
  - The **PET tracer uptake time** used during a routine clinical UCM FDG-PET scan is **90 minutes**.
  - The preferred FDG tracer uptake time for many clinical trials is often **60-75 minutes**.
  - Many trials will allow UCM's 90 minute uptake time after discussion regarding our clinical routine. Some trials, however, will insist on the shorter time and will query if it is not used.
  - The HIRO will generally raise this issue during the initial review of a trial's imaging manual and will advise the coordinators accordingly. Nonetheless, it is always good to keep an eye out for this issue.

# PET Scans

- **Mobile PET Scanner vs. Fixed PET Scanner**
  - UCM started utilizing a **mobile** PET scanner in Summer 2020 to help reduce the strain on the clinical schedule.
  - Although the quality of this scanner is comparable to our regular **fixed** PET scanner in DCAM, most clinical trials require us to explicitly qualify any PET scanner we use for trial-related scans.
  - Only our fixed scanner has the necessary accreditations and has been qualified for clinical trials that require explicit, trial-specific certification.

# PET Scans

- **Mobile PET Scanner vs. Fixed PET Scanner**
  - The mobile scanner is typically used for cardiac, brain, and lymphoma scans.
  - If you need to schedule a PET scan from the list above on a patient enrolled in (or screening for) a clinical trial, **you should request that the scan be performed using the fixed scanner in DCAM 0130**.
  - If you're not sure if the PET scans for your trial strictly require the fixed scanner, please feel free to consult with the HIRO.

# Questions?

THE UNIVERSITY OF CHICAGO | Human Imaging Research Office

- The HIRO is always available to help answer any imaging-related questions you might have! If we can't answer them, we will help find the people who can!

❖ **Phone:** 702-9172
❖ **Fax:** 834-6721
❖ **Office:** Billings I-102

❖**Website:** https://hiro.bsd.uchicago.edu
❖**Email:** hirohelp@bsd.uchicago.edu
❖**Twitter:** @HIRO_UofC
❖**Hours:** 8AM – 4PM, Monday - Friday


Photo credit Sara Serritella/UChicago ITM