VUIIS Human Imaging Core User Guide

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Getting Started

This guide is a guide for customers of the Human Imaging Core (HIC), providing information related to project applications, safety, scheduling, scanning, and data retrieval. It is a working document and is updated regularly. A link to this document, along with additional information and useful links can be found on the HIC web site:

https://vuiis.vumc.org/centers/humanimaging.php

This section provides a broad overview of the key aspects related to performing studies in the VUIIS Human Imaging Core (HIC) and applies to all the imaging modalities we offer. More detailed instructions specific to each imaging modality are provided later in the guide.

Protocol approval

- All human studies must have an active IRB-approved protocol.
- All animal studies must have an active IACUC-approved protocol.
- It is the responsibility of the PI and all lab members associated with the study (study team) to know the details, particularly with regard to safety requirements, of their protocol.

VUIIS project approval

- ALL studies/scans (human, animal, phantom) performed at the VUIIS HIC must be have an approved VUIIS project ID and be booked under the VUIIS-approved project ID:
  - The new project application form can be found here: https://redcap.vanderbilt.edu/surveys/?s=DAHR3TLT9F
  - Detailed instructions can be found here: https://vumc.box.com/s/me19lsgo6nf7cdrrluj5db89rt623c2s
  - Applications are reviewed every other week and may require clarification and revisions. Please allow at least 2 weeks prior to the start of a new study to receive approval.
- Projects have an expiration date and must be renewed annually.
  - The project renewal form can be found here: https://redcap.vanderbilt.edu/surveys/?s=7o5rdM
  - PIs, staff, and trainees associated with the project are responsible for keeping track of a project’s expiration date and applying for renewal, when/if appropriate.
    - For human studies, the project expiration coincides with the expiration date of the project’s IRB. When the IRB is renewed, please submit the updated, stamped letter of approval, the final action letter (FAL), via a project renewal request (see above).
    - The IRB may deem a project ‘minimal risk’, and no longer require annual IRB continuing review/renewal. In this event, your project will expire annually, and to renew your VUIIS project ID, submit the initial FAL for VUIIS annual project approval.
    - For animal studies, the project expiration coincides with the expiration date of the project’s IACUC protocol. When the IACUC protocol is renewed, please submit the updated, stamped protocol via a project renewal request (see above).
    - Phantom/ex vivo project IDs expire annually.
Resource calendars & billing

Reservation calendars and billing for all VUIIS HIC resources are maintained through the VUMC iLab system.

- **VUMC iLab registration instructions**
  
  [https://www.vumc.org/oor/ilab-system-registration-instructions](https://www.vumc.org/oor/ilab-system-registration-instructions)

- **VUIIS HIC Resource calendars**
  - Access to the VUIIS HIC resource calendars is restricted to approved users.
  - After you are registered in iLab, try to access the HIC equipment calendars: [https://vumc.corefacilities.org/service_center/3523/?tab=equipment](https://vumc.corefacilities.org/service_center/3523/?tab=equipment).
  - If you do not have access, it will prompt you to request access.
  - Access requests are monitored regularly. Please allow up to 48 hours for approval.
  - To view the calendars and make reservations, select the **Schedule Equipment** tab within the HIC facility page in iLab.
  - To view more than one calendar at a time, select the **View Reservations** tab. Note: You will not be able to create reservations directly from this view.

- **iLab billing numbers (self-scheduled/PAID studies only)**
  - All reservations require an active billing number in iLab.
    - **VUMC Customers:**
      - Billing numbers are entered into iLab by your home department. Please contact your local administrative team for assistance with getting center numbers entered into iLab.
      - The PI or department administrator must grant access to the billing number for each trainee/staff member who will need access to it for scheduling.
      - For questions regarding cost center numbers please reach out to the Office of Research (vumccoress@vumc.org).
    - **VU Customers:**
      - VU billing numbers (CoA or POET numbers) are entered as POs.
      - New POs and changes to existing POs must be entered by the VUMC Office of Research. Requests can be made here: [https://www.vumc.org/oor/vu-billing-number-change-use-vumc-core-groups-ilab-vumc-cores](https://www.vumc.org/oor/vu-billing-number-change-use-vumc-core-groups-ilab-vumc-cores)
      - Detailed information can be found here: [https://www.vumc.org/oor/user-guide-faqs-using-vu-funds-purchase-vumc-core-services-ilab](https://www.vumc.org/oor/user-guide-faqs-using-vu-funds-purchase-vumc-core-services-ilab)
      - For questions or assistance: VUMCores@vumc.org Please note: scholarships, vouchers, and VA billing numbers will be entered into the system for the users by the Office of Research.

- **Contact Jarrod True ([Jarrod.True@vumc.org](mailto:Jarrod.True@vumc.org)) with any questions regarding HIC iLab calendars and/or invoices from the Human Imaging Core.**

**Cancelations and Refunds**

- **Our general cancelation policy is:** any scan cancelled outside 24 hours prior to scan time results in no cancellation penalty.
  - This can be done in iLab by the reservation owner, and only by the reservation owner

- **If a scan must be canceled by the user group within 24 hours of actual scan time**
Please notify the technologist by phone that your scan will be cancelled and then follow up with an email:

- MRI: Vuiis.Hi.MRI@vumc.org
- PET/CT: Vuiis.Hi.PETCT@vumc.org
- Dexa/ Ultrasound: Vuiis.Hi.DXA.US@vumc.org

The full scan time will be charged for cancellations within the 24-hour window.

Note: Studies unable to be performed at the time of the scan due to insufficient information provided (related to the participant or protocol) will be subject to the cancelation fee.

- **If a scan is being performed and the data cannot be obtained**
  - Only the time used before/after resolution of the software/hardware malfunction will be charged.
  - If no data is obtained due to a software/hardware malfunction, the reservation will be refunded.

- **Examples of non-refundable requests:**
  - Participant related issues:
    - No-shows or late arrivals
    - Screening failure
    - Participant motion during scan
    - Participant requested to stop the scan early

- **Examples of refundable requests:**
  - Scanner hardware malfunction
  - Ancillary equipment malfunction
  - Emergency requiring technologist to not be available
  - Cancellation due to upgrades, scheduling concerns, or service

- **Any questions regarding receiving a refund for scan time, should be directed to Seth Smith (Seth.Smith@vanderbilt.edu).**

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**Differences between studies performed at the VUIIS and VUH/VUCH Radiology**

Because the Human Imaging Core is a research-only facility, there are several important differences between the research services provided by VUIIS and the clinical services provided by Vanderbilt University Hospital (VUH) or Vanderbilt Children’s Hospital (VCH) Radiology (MR, CT, and PET).

**Research only**

- All studies performed at VUIIS are designated “For Research Purposes only” and thus are governed by the IRB/IACUC and are not used for diagnosis, inside or outside clinical reads, and cannot be charged to a participant, insurance, or any other payee.

- All studies at VUIIS are considered de-identified using Recap forms.

- Images and/or data acquired on the VUIIS research scanners DO NOT enter the participant’s medical record. Additionally, the Human Imaging Core does not provide an official read by a radiologist.

- If you need an official read for your study, you will need to arrange a fee-for-service agreement with a VUH Radiologist.
- **MR studies**: Contact Seth Smith ([Seth.Smith@vanderbilt.edu](mailto:Seth.Smith@vanderbilt.edu)) for suggestions of radiologists whose specialties are relevant to your study.

- **PET studies**: Contact Todd Peterson ([todd.peterson@vumc.org](mailto:todd.peterson@vumc.org)) or the Dr. Aaron Jessop, Chief of the Department of Radiology and Radiological Sciences’ Nuclear Medicine Section to inquire about making arrangements for reads: [https://www.vumc.org/radiology/clinical/nuclearmedicine](https://www.vumc.org/radiology/clinical/nuclearmedicine)

  - If arrangements for official reads have been made, it will be the responsibility of the study team to get the images from gStudy (see Appendix II) to the radiologist for viewing.

### eStar

- Study personnel are responsible for any study-related documentation and ordering in the participant’s medical record.

- The Human Imaging Core is not a clinical department; therefore, our staff have either no access or very limited access to the VUMC electronic medical record system, eStar.

- If you need eStar access for research purposes, the Research Support Services office can help you after you complete this form: [https://is.gd/eStarResearchTrainingSecurity](https://is.gd/eStarResearchTrainingSecurity)

### Participant communication & chaperoning

- The study team is responsible for all communication with the participant, including appointment reminders and any instructions related to the study (e.g., fasting, other testing, etc.).

- Study personnel are responsible for meeting their participants and bringing them to the appropriate scanning suite for their appointment.
  - Waiting Areas can be found on the first floor of VUH, and the main lobby of VUIIS.

- Arrival time should be no more than 5 minutes before reservation.

- Someone listed as Key Study Personnel (KSP) on the IRB must remain in the imaging suite for the entire reservation.

### Exporting/Retrieving Data

- **All studies are automatically archived**
  - After each scan is performed, it is automatically sent to the VUIIS Research PACS system (based on the open source DCM4CHEE project).
  - MRI physlogs are sent at midnight each night. They will be available on gStudy the day following your scan.

- **This data archival is performed as a courtesy and is not guaranteed.**

- **All images and other related data are available for retrieval via the web-based application: gStudy**
  - Link: [https://www.vuiis.org/gstudy/](https://www.vuiis.org/gstudy/)
  - A DICOM viewer is also available for download (PC only).

- **Please note: The Human Imaging Core no longer burns data to disc (CD or DVD) for users.**
  - This can be done in the lab using gStudy. Be sure to select DICOM Viewer Tool before preparing the package for download.
  - The core is not responsible for any data transfer to external sites.
• **If you are unable to find your study:** Search * as the study name, select the date your study was performed: This will pull back all scans performed that day. This is helpful in case the ID was mistyped.

• **Questions related to gStudy and data retrieval, please contact Baxter Rogers** ([Baxter.rogers@vanderbilt.edu](mailto:Baxter.rogers@vanderbilt.edu)).
Contact

- Vuiis.Hi.MRI@Vumc.org

Your first visit

- Your will need to have your magnet screening form completed or prepared to be completed upon arrival

  - All resource users (i.e., PIs, staff, and trainees) who will be entering the MR scanning suites must have an approved magnet screening form either on file at the VUIIS or with Occupational Health.

    - The magnet screening form for resource users can be found here: https://redcap.vanderbilt.edu/surveys/index.php?s=YDL98KTFTM
    - For trainees, this form will be reviewed by our technologists. For VU and VUMC staff and faculty, Occupational Health will review your information.
    - You will be responsible for keeping your form up to date. Any change in surgical, metal injury, or implant status, will need to be changed before returning to the MRI room. These screening forms need to be kept current.

- Safety video/Education

  - You will be expected to watch a MRI safety video: https://redcap.vanderbilt.edu/surveys/?s=CJF4F84C4D
  
    - Alternatively, we offer a course at the beginning of the Spring, Summer, and Fall semesters to go over the safety video and provide an opportunity to ask questions about scanning and workflow: Human Imaging Core: New User Training Registration (vanderbilt.edu)

    - A link to a recorded version on the class can be found on the VUIIS website. This recording is not a replacement for the in-person class but can help to gain some insight and knowledge about our operations as you wait for the next User Orientation: https://redcap.vanderbilt.edu/surveys/?s=F74X8KHKJ

- Expectations

  - **Know your protocol.** This includes the equipment needed (coil, ancillary equipment, etc.), which patch you need applied, or if there are any special setup instructions. Worksheets are available to help you determine what you need for your project:

    - **MR:** http://www.vuiis.vanderbilt.edu/documents/mri_worksheet.pdf
  
    - Work with the technologists to learn how to assist them with the room set up and breakdown for your project.
  
    - For completely new projects, we advise arranging a time with one of the technologists to discuss your protocol/needs so guidance can be provided regarding what we will need from you for your study. Our goal is to make sure that all studies succeed and the more information we have, the better prepared we can be to provide that service.
Safety issues

- The greatest concern upon entering the MRI scan room is the potential of bringing dangerous ferromagnetic material into the room.

The scanner may have an adverse effect on many everyday items that tend to be forgotten in our pockets, just as it would some metal implants.

- Before entering the MRI room, thoroughly de-metal yourself, i.e. remove anything you may have in your pockets, on your neck, wrist or elsewhere on your body. Remember to never carry anything into the room that is not approved to be in the room.
  - Specifically (but not limited to): Keys, phone, watch, wallet, writing utensils, and loose hanging jewelry, clipboards, pocketknives.
  - Due to the exceptionally high field strength at 7T, increased caution is imperative:
  - More items to be removed: belt, glasses, body piercing (ears, belly button, etc.), clips or bobby pins. Frequently, items such as undergarments with supportive wires are also removed for comfort as they can be pulled by the magnetic field at 7T.

- Pregnancy Testing
  - VUIIS expects pregnancy testing for individuals of childbearing potential to be addressed in the labs protocol approved by the IRB. Pregnancy testing is required for study's being performed at 7T and study's requiring a Gadolinium contrast injection.
  - It is expected that users adhere to the guidelines set forth by IRB approved protocol to ensure participant safety and study eligibility.
  - VUIIS does not provide in-house pregnancy testing.

- Gadolinium Contrast Injection
  - Studies whose participants will be receiving gadolinium contrast will be required to address GFR screening in the protocol approved by the IRB.
  - It is up to those users to adhere to the guidelines related to contrast injection as set forth by IRB approved protocol.
  - VUIIS does not provide in-house GFR testing but requires documentation of safety to administer Gadolinium.

Scheduling

Scheduling is managed through our resource calendars on the VUIIS/VUMC iLab site (https://vumc.corefacilities.org/service_center/show_external/3523); however, the procedure for scheduling depends on the type of reservation: paid, matching, development, or opportunistic.

General scheduling information

- The reserved time covers ALL activities done in the scanner suite or in the scanner room.
  - When booking scanner time, please include time for: MRI tech to check MRI screening form, ensuring participant has been de-metaled, scanner software patch change, room and experiment set up, participant briefing, software patch change back to default, and clean up.

- Appointments are booked at a minimum of one hour and extend every half hour thereafter.
  - Half hour gaps in appointment times should be avoided.
  - Appointments should only be reserved if there is a participant to fill it. Reservations should not be made as place holders. VUIIS takes this very seriously, and continual cancellations due to place-
holders being used will be addressed. Scheduling place-holders creates a tension among users due to an apparently booked schedule that opens up the week of, ultimately preventing users from having equal access to the scanner for their studies.

- **An active VUIIS project ID is required to save a reservation.**
  - Our staff is not able to to schedule for you until your project ID is activated.
  - New project request form: [https://redcap.vanderbilt.edu/surveys/?s=DAHR3LT9F](https://redcap.vanderbilt.edu/surveys/?s=DAHR3LT9F)
  - Project renewal form: [https://redcap.vanderbilt.edu/surveys/?s=7o5rdM](https://redcap.vanderbilt.edu/surveys/?s=7o5rdM)
  - Please direct questions regarding project approval/renewal to [vuiis.hi.studyreview@vumc.org](mailto:vuiis.hi.studyreview@vumc.org).

- **When scheduling:**
  - Ilab will require: project ID, coil selection, software patch, and cost center to be charged.
    - Use boxes and drop downs to include any extra resources you may need (Button boxes, NNL...)
    - **DO NOT** include any private health information (PHI), such as the volunteer’s name, date of birth, medical record number, etc. in the comments section.

- **When booking scanner time, please include time for:**
  - Screening, metal removal, room set up and break down.
  - Participant prep (e.g., changing into gown, using restroom, etc.)
  - Getting the participant on/off the table if they have mobility issues

- **DO NOT** schedule placeholders (reservations without a confirmed participant).
  - If you do not have a participant, do not schedule a reservation; this prevents other groups from having fair access to the scanners.
  - The Core monitors user-cancelled reservations and reserves the right to charge labs for booked and cancelled placeholder reservations if a lab is repeatedly doing this.

**Self-scheduling paid reservations**

- **See ilab** for current rates.

- **Paid studies refer to reservations booked with a scholarship or grant.**
  - The scholarship or grant must have a billing number (i.e., center number) activated in iLab. (A billing number is required to save the reservation.)

- **Paid studies are self-scheduled by users.**

- **VUMC iLab access:**
  - VUIIS HIC calendars: [https://vumc.corefacilities.org/service_center/3523/?tab=equipment](https://vumc.corefacilities.org/service_center/3523/?tab=equipment)

- **Contact Jarrod True** ([jarrod.true@vumc.org](mailto:jarrod.true@vumc.org)) with any questions regarding HIC invoices/charges from the Human Imaging Core.
Requesting matching/development reservations

Definitions:

- **Matching time** – Matching time is provided to new intramural and/or extramural funded projects within VUIIS for you to meet with the technologists, discuss your protocol, scan a phantom to test operation of ancillary equipment, etc. That is, we use this time as a way to communicate scheduled time to make sure your study starts and functions as expected before participants are being enrolled. Matching time is available to all users who have fully funded studies.

- **Development time** – Development time is used in concert with a VUIIS primary faculty member to develop, implement, test, or evaluate new protocols, patches, functionality that have broad core impact. It cannot be used to supplement studies, and is not provided to develop tools for one’s own project. Development time is available to VUIIS primary faculty members only, so it is required that any user wishing to implement something new partner with a primary VUIIS faculty member to discuss the opportunity to develop new tools that could help the greater human imaging core users.

- **All matching/development hours are booked through the MRI technologists.**
  - View the resource calendars to find available times to request: https://vumc.corefacilities.org/service_center/3523/?tab=equipment
  - Reservation requests must be made by filling out this form: https://is.gd/vuiis_hic_mri_request
  - You will receive an email confirmation when your reservation has been scheduled. Please allow up to 24 hours for confirmation.
  - Matching and development hours are tracked monthly. If you need to inquire about the balance for a matching or development project, email the technologists (Vuiis.Hi.MRI@vumc.org).

- Requests to switch a paid study to matching study must be made BEFORE the last business day of the month in which the reservation occurred.

- Paid reservations should not be booked as a place holder for a matching/development scan.

- Paid studies cannot be switched to matching **after** the reservation has occurred.

Opportunistic scanning

Definition –

- Opportunistic time refers to time available on the scanner when the scanner is not being used. It is intended to be used for users to test ancillary equipment, test parameters on an exam card, or perform phantom studies. Opportunistic scanning is not bookable, and is not available in advance. Opportunistic scan time does not include technologist support, and thus is only available to VUIIS faculty, staff, and trainees, and cannot be used to scan research participants. If you are collaborating with a VUIIS faculty, staff, or trainee, this is a good opportunity to come into the suite during a slower time and retrieve data, perform reconstructions offline, test a patch functionality, etc. Opportunistic scan time only applies to scans performed during operational hours (i.e. when a technologist is present) and cannot be used for after-hours scanning.

- **This applies only to VUIIS faculty, staff, and trainees.**

- **These time slots are first come, first serve**
  - Every morning, the technologists post a sheet with available opportunistic time slots on the scanners on the door outside the 3Tb/7T scanner suite (Room AA0117).
• To reserve opportunistic time, print your name on the sheet in the desired time slot.
  • Opportunistic slots cannot be held without being billed.

• *You may be bumped from your requested time slot if Philips personnel need to get on the scanner/console or core staff need to use the scanner/console for core-related work, or the scan slot becomes booked for a paid research study.*

• No tech coverage is provided
  • Users are encouraged to utilize opportunistic scan time to work on scan protocols, ExamCards and improve skills. Times that are booked for ‘Phantoms/Super-users’ also fall into this category.
  • If you need a technologist’s help for one hour or more, you will need to reserve scan time using the aforementioned mechanisms.
  • Opportunistic scan users will be responsible for room set-up/breakdown, data transfer, and return of the software patch to default setting. All opportunistic scans must be finished and cleared out of the scan area 5 minutes before next appointment.
  • When finished the table should be fully out of the scanner, at its highest height. The head coil should be on the table, unplugged. All phantoms should be properly stored.

• Scanner room and console must be sanitized with purple top Sani-Cloth wipes when finished. If you are unsure how to sanitize the room, please work with a technologist to receive appropriate training. These wipes are carcinogenic and must be handled with care.

• If you run into an issue with the scanner or equipment, please immediately notify the technologists with a detailed description by emailing (Vuiis.Hi.MRI@vumc.org).

• ABSOLUTELY NO human studies can be performed without the supervision of a technologist and thus cannot be performed in an opportunistic fashion
  • Even for opportunistic scanning, a technologist must be in the suite when users are scanning at 7T.

Super-users and Super-user scanning

Definition –
• Several VUIIS faculty members have obtained significant, specialized training beyond standard use cases and can be called upon to support technologists, users, or others to perform scans without a technologist being present. These are called “super-users”. These scan operators can perform scans in healthy volunteers to develop/test/evaluate protocols that improve on core functionality without technologist supervision. However, all scans performed at 7T require a technologist in the suite to assure complete safety. Super-users can also assist other users in setting up protocols or testing patches and are meant to support the operation of the VUIIS technologists not supplant them.

• Superusers can be utilized to scan healthy volunteers during opportunistic scanning times.

• **Current Superusers**: Drs. Adam Anderson, Will Grissom, Vicky Morgan, Allen Newton, Saikat Sengupta, Kevin Harkins, Seth Smith, Kristin O’Grady, Ryan Robison.

• If you have questions about super-users, please contact Seth Smith (Seth.Smith@vanderbilt.edu)

After-hours phantom scanning

• ABSOLUTELY NO human studies can be performed without the supervision of a technologist.

• After hours scanning can be utilized for phantoms and ex vivo samples only.
• After hours scanning only applies to VUIIS faculty, staff, and trainees.
• All after-hours scans must have an approved VUIIS project ID and the protocol must be discussed with a technologist prior to scanning to verify safety of the study. Additionally, anyone wishing to perform after hours scanning will need to discuss with the technologists to be appropriately trained on setting up the room, breaking down the room, access to the room, etc.
  ▪ Paid, matching or development time may be used for after-hours phantom scanning, however, all after hours scans must be booked by a technologist using the approved VUIIS project ID.
• You must be present for the entire duration of the scan.
  ▪ You cannot set a scan up, leave, and come back when the scan is finished.
• You must arrange with the techs to get the scan room key
  ▪ It is your duty to make sure you get a key as they are not left out overnight.
• When finished the table should be fully out of the scanner, at its highest height. The head coil should be on the table, unplugged. All phantoms should be properly stored.
• Scanner room and console must be sanitized with purple top Sani-Cloth wipes when finished. If you are unsure how to sanitize the room, please work with a technologist to receive appropriate training. These wipes are carcinogenic and must be handled with care.
• If you run into an issue with the scanner or equipment, please immediately notify the technologists with a detailed description by emailing (Vuis.Hi.MRI@vumc.org).

Billing and Cancellation fees

Billing
• See iLab for current rates
• All Matters related to funding sources in ILab go through the Office of Research. They can be reached at (Vumcores@vumc.org).
• Contact Jarrod True (Jarrod.True@vumc.org) with any questions regarding invoices from the Human Imaging Core.

Cancellations
• Our current cancelation policy is: any scan canceled outside 24 hours prior to scan time results in no cancellation penalty.
  ▪ This can be done in iLab by the reservation owner, and only by the reservation owner
• If a scan must be canceled by the user group within 24 hours of actual scan time
  ▪ Please notify the technologist by phone that your scan will be cancelled and then follow up with an email to (Vuis.Hi.MRI@vumc.org).
  ▪ The full scan time will be charged for cancelations within the 24-hour window.
  ▪ Note: Studies unable to be performed at the time of the scan due to insufficient information provided (related to the participant or protocol) will be subject to the cancelation fee.
• If a scan is being performed and the data cannot be obtained
  - Only the time used before/after resolution of the software/hardware malfunction will be charged.
  - If no data is obtained due to a software/hardware malfunction, the reservation will be refunded.

• Examples of non-refundable requests:
  - Participant related issues:
    o No-shows or late arrivals
    o MRI magnet screening failure
    o Participant motion during scan
    o Participant requested to stop the scan early
    o Software patch crashes or lack of expected functionality
    o Unclear directions on coil setup, ePrime setup, etc. resulting in loss of scan time

• Examples of refundable requests:
  - Scanner hardware malfunction
  - Ancillary equipment malfunction
  - Emergency requiring technologist to not be available
  - Cancellation due to upgrades, scheduling concerns, or service
  - Any questions regarding receiving a refund for scan time, should be directed to Seth Smith (Seth.Smith@vanderbilt.edu).

MRI Screening

• Each volunteer must complete a new magnet screening form (link below) every time he/she is scanned.
  - The scan cannot proceed until this form is reviewed and approved by the technologist on duty. When this form is approved, a unique scan number is generated. This scan number is combined with the PI's last name to create the Patient Name for the scan. See Entering a New Examination at the scanner console for more information.

• Participants should complete the online screening form in advance and save the screening form return code: https://redcap.vanderbilt.edu/surveys/?s=F3jsne
  - Instruct the participant to click Save and Return Later after completing the form
  - The RA/user should check this form, using the return button at the top right of the form, well before the scan appointment.

• Call special attention to any questionable implant/procedure/surgery via email to (Vuiis.Hi.MRI@vumc.org) as soon as possible. Every attempt should be made to raise concerns at least 1 week prior to the study.
  - Please include the screening form return code and have as much information on the surgery/implant in question uploaded to the screening form as possible.
  - The MRI technologists will review the information and decide if an implant list or x-ray will be required in order to clear the participant.
  - All surgeries and implants are reviewed on a case-by-case basis. MRI safety is something we take very seriously at VUIIS, and we are constantly trying to improve and review all safety requirements.

* Please note: As we continue to learn and progress, we may allow a surgery/implant that was previously denied for another patient. This is not meant to imply that we are picking and choosing, but rather that
we have learned something different that we did not know previously. Alternatively, something that may have been safe at one point, may no longer be safe as determined by the ACR and other guidelines that we follow. We always utilize the most recent information we have available to us at the time of inquiry.

- Bring the screening form return code with you to your study, as well as the MRI Worksheet for your study if you have one.
  - The MRI Worksheet can be found here: [https://vuiis.vumc.org/documents/mri_worksheet.pdf](https://vuiis.vumc.org/documents/mri_worksheet.pdf)
- Additional documentation, such as pregnancy testing results, or GFR clearance may be required if your study includes contrast administration.
- A screening form must also be filled out for animal scans to improve our documentation. Please include the animals date of birth and weight. Animal Screening form: [https://redcap.vanderbilt.edu/surveys/?s=DKTTL9X4MF](https://redcap.vanderbilt.edu/surveys/?s=DKTTL9X4MF)

**Scanning Expectations**

- Please be respectful and maintain a professional decorum.
  - We scan a diverse population of volunteers, including young children and participants with mental disorders and very serious illnesses. Many of whom are not comfortable in the scanning environment as we are.
- To ensure participant privacy, please do not enter the scanner area with your volunteer until the beginning of your appointment time.
  - Please ask your volunteer and anyone accompanying them to wait in the VUIIS lobby or VUH 1st floor waiting room if you are early.
  - The VUIIS waiting areas have limited space/seating. Please consider using other locations if your participant has several people accompanying him/her.
  - Please respect any drawn curtains or shut doors if you need to speak with one of the technologists prior to your appointment time.
- Your time in the scanner area starts at the *beginning* of your appointment time.
  - You will not be provided access to the scanner suite or technologists for equipment setup or screening form approval prior to your scheduled appointment.
  - This still applies even if there is not a reservation directly before yours.
- Your reservation, not the scan, ends at the *end* of your appointment time.
  - Scanning should be complete 3 minutes prior to the end of your appointment time to get the participant/phantom/sample off the table, perform any specialized data export, and sanitization protocols.
  - Any scan that goes over its allotted time will be subject to:
    - Availability of scanner (the next user will not be infringed upon)
    - Additional charges for additional scan time utilized
    - Immediate stoppage (please structure your ExamCard in descending order of importance)
    - Delayed data transfer/handling
    - **NHP scans should end 30 minutes prior to the end of their reservation time to allow for proper cleaning protocols.**
• KNOW YOUR IRB PROTOCOL.
  - It is your responsibility to know what is in your IRB protocol.
  - This is especially vital when working with the 7T magnet. The techs may clear a metal implant; however, if your IRB protocol says NO METAL, your participant will not be able to be scanned. The same is true when it comes to pregnancy testing at the 7T.
  - VUIIS expects pregnancy testing for individuals of childbearing potential to be addressed in the labs protocol approved by the IRB. This is required for study’s being performed at 7T and study’s requiring a Gadolinium contrast injection.
  - It is expected that users adhere to the guidelines set forth by IRB approved protocol to ensure participant safety and study eligibility.
  - VUIIS does not provide in-house pregnancy testing.
  - If you are looking for advice on how to amend your IRB protocol and guidance on verbiage, please contact Seth Smith (Seth.Smith@vanderbilt.edu).

Scan room setup/breakdown

• Please assist the tech during setup AND breakdown.
  - To maximally utilize your available scan time, we ask that you help the technologist ready the room for your study.
  - In the event you need to change a coil: unplug the coil from the scanner (gently), wrap the cord(s) around the coil. It is important to follow the natural curvature of the cord. Torqueing the cord in the wrong direction may cause the cord to break and/or fray.
  - Linens are changed between each participant. Dirty linen goes in yellow bags either outside the scanner door or in the patient changing areas.

• Know what you need (coils, button boxes, etc.)
  - If your study requires the use of button boxes, NNL headphones, or any other ancillary equipment. It is your responsibility to coach your participant, and help set up those items.
Entering a New Examination at the scanner console

- The information listed below is required to start a new scanning session on the MR scanners.
- The following convention is used (and required) to ensure data are properly stored and retrievable from the data archival system:

<table>
<thead>
<tr>
<th>Required entries</th>
<th>Value</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient name</td>
<td>PILastName_ApprovedScreeningCode (e.g., GORE_123456)</td>
<td><strong>PILastName</strong> = Last name of PI for the study</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>ApprovedScreeningCode</strong> = scan-specific code the techs will provide after approving the magnet screening form</td>
</tr>
<tr>
<td>Registration ID</td>
<td>PILastName_ApprovedScreeningCode (e.g., GORE_123456)</td>
<td>Copy and paste the patient name</td>
</tr>
<tr>
<td>Date of birth</td>
<td>01/01/YYYY (e.g., 01/01/1975)</td>
<td>Month and day are ALWAYS “01”</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td>Male/Female/Phantom</td>
</tr>
<tr>
<td>Exam name</td>
<td></td>
<td>optional</td>
</tr>
<tr>
<td>Patient weight</td>
<td></td>
<td>Value in pounds</td>
</tr>
</tbody>
</table>

- The HIC is not responsible for data retrieval difficulties if the user entered his/her own information in the New Examination page and did not follow this convention.

Exporting/Retrieving Data

- All studies are automatically archived
  - After each scan is performed, it is automatically sent to the VUIIS Research PACS system (based on the open source DCM4CHEE project).
  - Physlogs are sent at midnight each night. They will be available on gStudy the day following your scan.
  - The MRI technologists check throughout the day to make sure that all studies have successfully made it to the PACS system. Scans do not get deleted from the scanner database unless they have been confirmed to be in the PACS.
- This data archival is performed as a courtesy and is not guaranteed.
- MR images and other related data are available for retrieval via the web-based application: gStudy
  - Link: [https://www.vuiis.org/gstudy/](https://www.vuiis.org/gstudy/)
Data can be exported as DICOM (classic or enhanced format), NIFTI, or PAR/REC format. Barring specific situations, please retrieve either the original DICOMs or NIFTI using the most recent version of the NIFTI conversion. NIFTI files are produced each time on-the-fly.

- A DICOM viewer is also available for download (PC only).

- **If you are unable to find your study:** Search * as the study name, select the date your study was performed: This will pull back all scans performed that day. This is helpful in case the ID was mistyped.

- **Please note:** The Human Imaging Core no longer burns data to disc (CD or DVD) for users.
  - This can be done in the lab using gStudy. Be sure to select DICOM Viewer Tool before preparing the package for download.

- **Scan parameters can be exported from the scanner console in a viewable format (.xml):**

  **Note:** The patch that was applied during the scan must be applied when exporting the ExamCard parameters to ensure the correct parameters and values are exported.

  - **Sequences must be exported individually.**
    - The examcard you wish to export must be loaded into the queue on the left side of the interface.
    - Right click on the sequence you want to export
    - Select **Save Protocol to Text File**
    - Select a location to save this file. (Default location: (E:)Export)

- **Questions related to gStudy and data retrieval, please contact Baxter Rogers (Baxter.rogers@vanderbilt.edu).**

### S10 Citations

- The Office of Research offers a $250 VUMC Core voucher for each S10 Citation.

<table>
<thead>
<tr>
<th>MR: 3Ta Philips Elition 3.0T</th>
<th>1S10OD021771-01</th>
</tr>
</thead>
<tbody>
<tr>
<td>MR: 7T</td>
<td>1S10RR023047-01</td>
</tr>
<tr>
<td>General Citation</td>
<td>This work was performed using instruments housed in the Vanderbilt Center for Human Imaging.</td>
</tr>
</tbody>
</table>
PET/CT (VUH 165)

Contact

- [Vuiis.Hi.PETCT@Vumc.org](mailto:Vuiis.Hi.PETCT@Vumc.org)

The Human Imaging Core operates a Philips Verios PET/CT scanner. This includes scheduling, billing, and staffing for the scanner, as well as IV administration of radiopharmaceuticals and coordination with the VUIIS radiochemistry core.

Production and dispensing of radiopharmaceuticals produced under INDs, as well as delivery of all radiopharmaceuticals, is coordinated by the VUIIS Radiochemistry Core (Director: Dr. Todd Peterson).

This scanner has been approved to scan both humans and animals.

Getting Started

**Step 1: Protocol development**

- Prior to initiating a study, investigators should contact Todd Peterson, VUIIS Director of Nuclear Imaging & Radiochemistry, ([Todd.E.Peterson@vanderbilt.edu](mailto:Todd.E.Peterson@vanderbilt.edu)) to discuss feasibility, protocol design, and radiotracer sourcing.

**Step 2: Regulatory requirements for PET studies**

**Authorized User**

- An Authorized User (AU) from the Department of Radiology and Radiological Sciences’ Nuclear Medicine Section must be included as key study personnel on the IRB associated with your protocol.
  - To administer radioactive materials in humans, an institution is required under TN State Regulations to have an authorized user (AU) who is responsible for those individuals.
- This requirement is to ensure that an AU approved by the VUMC Radiation Safety Committee has judged the use of the radiotracer for that study to be safe and scientifically justified.
- The AU listed on the protocol does not need to be present for all of the scans performed. Instead, our technologist informs the AU who will be on-call at the time of a scan, providing information including radiotracer, study PI, and contact info. The tacit consent of that AU serves as approval to proceed, and that AU would then be contacted in case any problem was to be encountered with the administration.
- The current list of AUs in the Nuclear Medicine Section can be found here, [https://www.vumc.org/radiology/clinical/nuclearmedicine](https://www.vumc.org/radiology/clinical/nuclearmedicine), under “Section Chief and Members.” If you are not already working with one of the AUs, Todd Peterson ([Todd.E.Peterson@vanderbilt.edu](mailto:Todd.E.Peterson@vanderbilt.edu)) can assist in connecting you with an AU.

**Investigational Drug Service**

- All studies using radiopharmaceuticals must register with Investigational Drug Service (IDS) so that they have a record of the associated IRB. A copy of the IDS form is on the last page of this document.
• Please complete this form and email it to Donna Torr (Donna.K.Torr@vumc.org) prior to applying for a VUIIS project.

*Exception: Studies using radiopharmaceuticals produced under an IND do NOT have to register with IDS.

Step 3: VUIIS project application

• See VUIIS project approval for instructions regarding project applications. Once your project has been approved and the HIC-specific project ID assigned, please contact PET/CT technologists (Vuiis.Hi.PETCT@vumc.org) and Todd Peterson (Todd.E.Peterson@vanderbilt.edu) to assist in setting up your protocol on the scanner.

Scheduling

VUIIS HIC PET/CT calendar

https://vumc.corefacilities.org/service_center/3523/?tab=equipment

Usage types

• There two usage type options when making a reservation on the PET/CT scanner: Injection and Standard Use.

Injection

• The purpose of this usage type is to reserve the technologist’s time for the injection of the radiotracer for your study if your protocol requires an uptake time after injection.
• There is no charge for this usage type.
• Venipuncture is offered by technologists at the time of the study.
• To ensure the safety of participants, all injections will be made through a peripheral IV access.
• Injections may not be made through any access other than a peripheral IV (Port, PICC, etc.)

Standard Use

• The purpose of this usage type is to reserve time associated with the scanner.
• This is the default usage type and has an associated hourly rate (see iLab for current rates).
• When booking scanner time, please include time for:
  ▪ Clinical lab results review (e.g., pregnancy test, kidney function, etc.)
  ▪ Participant prep (e.g., IV insertion, changing into gown, etc.)
  ▪ Getting the participant on/off the table if they have mobility issues
  ▪ Time post scan for sanitization protocols
• Animal studies typically require additional time for setup before and cleaning according to SOP after the scan. Please include this is the total reservation time. 30 minutes should be allotted to wake and animal from anesthesia in the PET/CT room.

Custom form

• Special instructions or notes for the technologist should be entered in the comments section of the custom form.
• **DO NOT** include any private health information (PHI), such as the volunteer’s name, date of birth, medical record number, etc. in the comments section.

**Cancelations & changes to a reservation**

• **Our current cancelation policy is:** any scan canceled outside 24 hours prior to scan time results in no cancellation penalty.
  - This can be done in iLab by the reservation owner, and only by the reservation owner

• **If a scan must be cancelled by the user group within 24 hours of actual scan time**
  - Please notify the technologist by phone that your scan will be cancelled and then follow up with an email to [Vuiis.Hi.PETCT@vumc.org](mailto:Vuiis.Hi.PETCT@vumc.org).
  - The full scan time will be charged for cancelations within the 24-hour window.
  - Note: Studies unable to be performed at the time of the scan due to insufficient information provided (related to the participant or protocol) will be subject to the cancelation fee.

• **If a scan is being performed and the data cannot be obtained**
  - Only the time used before/after resolution of the software/hardware malfunction will be charged.
  - If no data is obtained due to a software/hardware malfunction, the reservation will be refunded.

• **Examples of non-refundable requests:**
  - Participant related issues:
    - No-shows or late arrivals
    - Screening failure
    - Participant motion during scan
    - Participant requested to stop the scan early

• **Examples of refundable requests:**
  - Scanner hardware malfunction
  - Issues with production of radiotracer
  - Ancillary equipment malfunction
  - Emergency requiring technologist to not be available
  - Cancellation due to upgrades, scheduling concerns, or service

• **Any questions regarding receiving a refund for scan time, should be directed to Seth Smith ([Seth.Smith@vanderbilt.edu](mailto:Seth.Smith@vanderbilt.edu)) or Todd Peterson ([Todd.E.Peterson@vanderbilt.edu](mailto:Todd.E.Peterson@vanderbilt.edu)).**

**Radiotracers**

• Be sure to alert the technologists ([Vuiis.Hi.PETCT@vumc.org](mailto:Vuiis.Hi.PETCT@vumc.org)) directly if you need to reschedule or cancel a study. **Failure to do so may result in charges for the unused radiopharmaceutical.**

• **If you ordered a radiotracer from the Radiochemistry Core:**
  - You are responsible for alerting the Radiochemistry Core to any changes in the reservation date/time or cancellations: YY Cheung ([Yiu-Yin.Cheung@vumc.org](mailto:Yiu-Yin.Cheung@vumc.org)).

• **Please note that the Radiochemistry Core also has a 24-hour cancellation policy.**
Preparing for a PET Scan: Required actions

After you have made a reservation for the scanner, please complete the following **required** procedures:

**Radiopharmaceutical Order (Human PET studies only)**

- **Radiopharmaceuticals are considered drugs by the FDA;** therefore, a physician-signed order is required for dispensing the radiopharmaceutical for your PET scan.
- Complete the form in [Appendix III](#) for each scan and upload it in the screening form mentioned below.

**IMPORTANT:** This order is for documentation purposes only. It does not result in the ordering and/or dispensing of the actual radiotracer. See the next section for more information on how to acquire the actual radiotracer.

**PET/CT pre-scan form (ALL studies)**

- Each volunteer must complete a new PET/CT screening form (link below) every time they are scanned.
  - The scan cannot proceed until this form is reviewed and approved by the technologist on duty. When this form is approved, a unique scan number is generated. This scan number is combined with the PI’s last name to create the Patient Name for the scan.
- **Participants should complete the online screening form in advance and save the screening form return code:** [https://redcap.vanderbilt.edu/surveys/?s=J74YR3HYPT](https://redcap.vanderbilt.edu/surveys/?s=J74YR3HYPT)
  - Instruct the participant to click **Save and Return Later** after completing the form.
  - The RA/user should check this form, using the return button at the top right of the form, well before the scan appointment.

**Radiotracer ordering (PET only)**

- The procedure for acquiring the radiotracer for your study will depend on the source of the tracer. If you are not sure of the supplier of the radiotracer for your study, please contact the technologists ([Vuiis.Hi.PETCT@vumc.org](mailto:Vuiis.Hi.PETCT@vumc.org)) and Todd Peterson ([Todd.E.Peterson@vanderbilt.edu](mailto:Todd.E.Peterson@vanderbilt.edu)) for assistance.

**Radiochemistry Core**

- **You or someone from your study team** are responsible for ordering radiotracers supplied by the VUIIS Radiochemistry Core.
- Orders are placed in iLab: [https://vumc.corefacilities.org/sc/3524/vumc-institute-of-imaging-science-vuiis-radiochemistry/?tab=services](https://vumc.corefacilities.org/sc/3524/vumc-institute-of-imaging-science-vuiis-radiochemistry/?tab=services)
- Please contact Todd Peterson ([Todd.E.Peterson@vanderbilt.edu](mailto:Todd.E.Peterson@vanderbilt.edu)), Director of the Radiochemistry Core, with any questions about tracer production or pricing.

**PETNET & Other outside suppliers**

- Human Imaging Core staff will order radiotracers supplied by PETNET (FDG is the most common tracer supplied by PETNET).
• You will also need to submit a service request with the Radiochemistry Core for billing & delivery: https://vumc.corefacilities.org/sc/3524/vumc-institute-of-imaging-science-vuiis-radiochemistry/?tab=services

Pregnancy testing (Human scans only)

• Pregnancy testing is required for all female participants of child-bearing potential prior to administration of a radiopharmaceutical.
  ▪ Results should be within 24 hours of the scheduled scan and available for review in the participant’s medical record.
  ▪ Results from serum testing are preferred as urine may be too dilute for a reliable result; however, urine test results will be accepted if the study IRB explicitly allows them and the Authorized User on the study approves.
  ▪ VUIIS expects pregnancy testing for individuals of childbearing potential to be addressed in the protocol approved by the IRB. It is expected that users adhere to the guidelines set forth by IRB to ensure participant safety and study eligibility.
  ▪ If pregnancy testing for DXA scanning is not included in the approved protocol, VUIIS will require a pregnancy test to be performed prior to the DXA scan.
  ▪ VUIIS does not provide pregnancy testing.

Participant communication (Human scans only)

• The study team is responsible for all communication with the participant, including appointment reminders and any instructions related to the study (e.g., fasting, other testing, etc.).

Scanning

General information

• Please be respectful and maintain a professional decorum.
  ▪ The waiting area for the PET suite is shared space with the adjacent VUIIS MR scanner suite.
  ▪ We scan a diverse population of volunteers, including young children and patients with mental disorders and very serious illnesses.

• To ensure patient privacy, please do not arrive with your volunteer until the beginning of your appointment time.
  ▪ Please ask your volunteer and anyone accompanying them to wait in the main hospital lobby or your designated meeting place if they arrive early.
  ▪ Please respect any drawn curtains or shut doors if you need to speak with one of the technologists prior to your appointment time.

• Your time in the scanner area starts at the beginning of your appointment time.
  ▪ You will not be granted access to the scanner suite or technologists for equipment setup prior to your scheduled appointment, even if there is not a study before yours.

• Know your IRB protocol
  ▪ It is your responsibility, not the technologist’s, to know what is in your IRB protocol.
• If you are looking for advice on how to amend your IRB protocol and guidance on verbiage, please contact Todd Peterson (Todd.E.Peterson@vanderbilt.edu).

• Someone listed as KSP on the IRB must remain in the PET suite for the entire reservation.

Billing

Imaging

• See iLab for current rates.

• All Matters related to funding sources in iLab go through the Office of Research. They can be reached at (Vumccores@vumc.org).

• Contact Jarrod True (Jarrod.True@vumc.org) with any questions regarding invoices/charges from the Human Imaging Core.

Radiotracers

• All billing for radiotracers will be routed through the VUIIS Radiochemistry Core, regardless of the source (Radiochemistry, PETNET, etc.).

Questions related to radiotracer billing should be directed to Adam Rosenberg (Adam.J.Rosenberg@vumc.org) in the Radiochemistry Core.

Exporting/Retrieving Data

• All studies are automatically archived
  ▪ Data will be sent to the VUIIS Research PACS system (based on the open source DCM4CHEE project).
  ▪ This data archival is performed as a courtesy.

• PET/CT images are available for retrieval via the web-based application: gStudy
  ▪ Link: https://www.vuiis.org/gstudy/
  ▪ Data can be exported as DICOM (classic or enhanced format).
  ▪ A DICOM viewer is also available for download (PC only).

• If you are unable to find your study: Search * as the study name, select the date your study was performed: This will pull back all scans performed that day. This is helpful in case the ID was mistyped.

• Please note: The Human Imaging does not burn data to disc (CD or DVD).
  ▪ This can be done in the lab using gStudy. Be sure to select DICOM Viewer Tool before preparing the package for download.
  ▪ The core is not responsible for any data transfer to external sites.

• Questions related to gStudy and data retrieval, please contact Baxter Rogers (Baxter.rogers@vanderbilt.edu).
OCT (AA00117)

Scheduling

- **OCT Reservations in iLab:**
  - Login to VUMC iLab: [https://vumc.corefacilities.org/service_center/3523/?tab=equipment](https://vumc.corefacilities.org/service_center/3523/?tab=equipment)
  - Select the NIRS Room, NIRS Equipment & OCT Equipment calendar on the Schedule Equipment tab in Human Imaging core facility page.
  - Change the usage type to **OCT Equipment $55.00/hr (needs approval).**
  - Select billing number. (Approval will be pending selection of an active billing number.)
  - Select your VUIIS project ID from the list in the Required forms section.
  - If you do not see your project ID, please contact [Vuiis.hi.studyreview@vumc.org](mailto:Vuiis.hi.studyreview@vumc.org).
- Select **Save Reservation.**
- An email will be sent to alert the appropriate staff of your reservation.
  - Please note that your reservation slot is being held for you even if does not appear to have been approved yet.
- **A 30 minute reservation is typically sufficient for each participant.**
- **Reservations can be modified up to 1 hour before the scheduled start time.**

Billing and Cancellation Fees

Billing

- **See iLab for current rates.**

- All Matters related to funding sources in ILab go through the Office of Research. They can be reached at [Vumccores@vumc.org](mailto:Vumccores@vumc.org).

- Contact Jarrod True ([Jarrod.True@vumc.org](mailto:Jarrod.True@vumc.org)) with any questions regarding HIC invoices/charges from the Human Imaging Core.

Cancelations

- **Our current cancelation policy is:** any scan canceled outside 24 hours prior to scan time results in no cancellation penalty.
  - This can be done in iLab by the reservation owner, and only by the reservation owner within the 24-hour window.
  - Note: Studies unable to be performed at the time of the scan due to insufficient information provided (related to the participant or protocol) will be subject to the cancelation fee.
- **If a scan is being performed and the data cannot be obtained**
  - Only the time used before/after resolution of the software/hardware malfunction will be charged.
  - If no data is obtained due to a software/hardware malfunction, the reservation will be refunded.
• **Examples of non-refundable requests:**
  - Participant related issues:
    - No-shows or late arrivals
    - Participant requested to stop the scan early

• **Examples of refundable requests:**
  - Scanner hardware malfunction
  - Cancellation due to upgrades, scheduling concerns, or service

  ▪ **Any questions regarding receiving a refund for scan time, should be directed to Seth Smith (Seth.Smith@vanderbilt.edu).**

**Scanning**

• **Required documents:**
  - Completed OCT Scan Log Form (*Appendix IV*)
  - The information from this form will be entered into a REDCap form to automatically generate a unique ID for the scan (e.g., S####

**Data Retrieval**

• **Data will be accessible from gstudy**

**gStudy**

• Login into gstudy: [https://www.vuiis.org/gstudy/](https://www.vuiis.org/gstudy/)
  - Search for the REDCap-generated scan ID (e.g., *S####

• **If you are unable to find your study: Search * as the study name, select the date your study was performed:** This will pull back all scans performed that day. This is helpful in case the ID was mistyped.

• **Please note:** The Human Imaging Core no longer burns data to disc (CD or DVD) for users.
  - This can be done in the lab using gStudy. Be sure to select DICOM Viewer Tool before preparing the package for download.
  - The core is not responsible for any data transfer to external sites.

• **Questions related to gStudy and data retrieval, please contact Baxter Rogers (Baxter.rogers@vanderbilt.edu).**
DXA (AA0124)

Contact

- Vuiis.Hi.Dxa.US@Vumc.org

Scheduling

Scheduling is managed through our resource calendars on the VUMC iLab site Login to VUMC iLab: https://vumc.corefacilities.org/service_center/3523/?tab=equipment

- Select the DXA calendar on the Schedule Equipment tab in Human Imaging core facility page.
- Paid studies are self-scheduled by users.
- The reserved time covers ALL activities done in the scanner suite or in the scanner room:
  - Reservation time should include time for the technologist to review of participant screening form, position the participant on the scan table, total scan time and 2-3 minutes at the end of the reservation to get your participant off the table and perform sanitization protocols.
- Appointments are booked at a minimum of 30 minutes and extend every half hour thereafter.
  - Appointments should only be reserved if there is a participant to fill it. Reservations should not be made as place holders.
    - If you do not have a participant, do not schedule a reservation; this prevents other groups from having fair access to the scanners.
    - The Core monitors user-cancelled reservations and reserves the right to charge labs for booked and cancelled placeholder reservations.
  - iLab will require: project ID, anatomical area to be scanned and cost center to be charged.
    - Any post-processing algorithms needed can be listed in the comments section.
      - **DO NOT** include any private health information (PHI), such as the volunteer’s name, date of birth, medical record number, etc. in the comments section.

Billing and Cancellation Fees

Billing

- See iLab for current rates.
- All Matters related to funding sources in iLab go through the Office of Research. They can be reached at Vumccoress@vumc.org
- Contact Jarrod True (Jarrod.True@vumc.org) with any questions regarding HIC invoices/charges from the Human Imaging Core.
Cancelations

- **Our current cancelation policy is:** any scan canceled outside 24 hours prior to scan time results in no cancellation penalty.
  - This can be done in iLab by the reservation owner, and only by the reservation owner within the 24-hour window.
  - Note: Studies unable to be performed at the time of the scan due to insufficient information provided (related to the participant or protocol) will be subject to the cancelation fee.

- **If a scan is being performed and the data cannot be obtained**
  - Only the time used before/after resolution of the software/hardware malfunction will be charged.
  - If no data is obtained due to a software/hardware malfunction, the reservation will be refunded.

- **Examples of non-refundable requests:**
  - Participant related issues:
    - No-shows or late arrivals
    - Participant Motion
    - Participant requested to stop the scan early

- **Examples of refundable requests:**
  - Scanner hardware malfunction
  - Cancellation due to upgrades, scheduling concerns, or service

- **Any questions regarding receiving a refund for scan time, should be directed to Seth Smith (Seth.Smith@vanderbilt.edu).**

Scanning

- **Required documents:**
  - Signed consent form
    - Each volunteer must complete a new DXA screening form (link below) every time they are scanned.
      - The scan cannot proceed until this form is reviewed and approved by the technologist on duty. When this form is approved, a unique scan number is generated. This scan number is combined with the PI’s last name to create the Patient Name for the scan.
    - Completed DXA Screening Form: [https://redcap.vanderbilt.edu/surveys/?s=MRPNCR3L7P](https://redcap.vanderbilt.edu/surveys/?s=MRPNCR3L7P)
    - Pregnancy test results should be uploaded to the screening form prior to the scan.

Expectations

- **Know your protocol**
  - You will be expected to communicate with the technologist what scans you need performed (Femur, wrist, etc..), which extremity is to be scanned (left vs right), as well as any post processing algorithms you may need. A worksheet is available to help you determine what you need for your project:
    - [https://vuiis.vumc.org/documents/DXA_Worksheet.pdf](https://vuiis.vumc.org/documents/DXA_Worksheet.pdf)
  - To ensure patient privacy, please do not enter the scanner area with your volunteer until the beginning of your appointment time.
Pregnancy testing (Human scans only)

- Pregnancy testing is required for all female participants of child-bearing potential prior to administration of radiation.
  - Results should be within 7 days of the scheduled scan.
  - Results from serum testing are preferred as urine may be too dilute for a reliable result; however, urine test results will be accepted if the study IRB explicitly allows them and the Authorized User on the study approves.
- VUIIS expects pregnancy testing for individuals of childbearing potential to be addressed in the protocol approved by the IRB. It is expected that users adhere to the guidelines set forth by IRB to ensure participant safety and study eligibility.
- If pregnancy testing for DXA scanning is not included in the approved protocol, VUIIS will require a pregnancy test to be performed prior to the DXA scan.
- VUIIS does not provide in-house pregnancy testing.

Data Retrieval

- Print outs with various measurements are available at the end of the study. These are also available on gStudy.
- Data is available for retrieval via the web-based application: gStudy
  - Link: https://www.vuiis.org/gstudy/
- If you are unable to find your study: Search * as the study name, select the date your study was performed: This will pull back all scans performed that day. This is helpful in case the ID was mistyped.
- Please note: The Human Imaging Core no longer burns data to disc (CD or DVD) for users.
  - This can be done in the lab using gStudy. Be sure to select DICOM Viewer Tool before preparing the package for download.
  - The core is not responsible for any data transfer to external sites.
- Questions related to gStudy and data retrieval, please contact Baxter Rogers (Baxter.rogers@vanderbilt.edu).
Ultrasound (AA0124)

Contact

- Vuiis.Hi.Dxa.US@Vumc.org

Scheduling

Scheduling is managed through our resource calendars on the VUMC iLab site. Login to VUMC iLab: https://vumc.corefacilities.org/service_center/3523/?tab=equipment

- Select the Ultrasound calendar on the Schedule Equipment tab in Human Imaging core facility page.
- Paid studies are self-scheduled by users.
  - If you need to use the muscle physiology lab (AA0112) to perform your study, please be sure to make a correlating reservation on that calendar.
  - There is no charge for the room, only for the ultrasound machine.
- The reserved time covers ALL activities done in the scanner suite or in the scanner room:
  - Reservation time should include time for the technologist to review of participant screening form, position the participant on the scan table, total scan time and 2-3 minutes at the end of the reservation to get your participant off the table and perform sanitization protocols.
- Appointments are booked at a minimum of 30 minutes and extend every half hour thereafter.
  - Appointments should only be reserved if there is a participant to fill it. Reservations should not be made as place holders.
    - If you do not have a participant, do not schedule a reservation; this prevents other groups from having fair access to the scanners.
    - The Core monitors user-cancelled reservations and reserves the right to charge labs for booked and cancelled placeholder reservations.

- DO NOT include any private health information (PHI) in the iLab reservation.

Billing and Cancelation Fees

Billing

- See iLab for current rates.
- All Matters related to funding sources in iLab go through the Office of Research. They can be reached at Vumccores@vumc.org.
- Contact Jarrod True (Jarrod.True@vumc.org) with any questions regarding HIC invoices/charges from the Human Imaging Core.

Cancelations

- Our current cancelation policy is: any scan canceled outside 24 hours prior to scan time results in no cancellation penalty.
  - This can be done in iLab by the reservation owner, and only by the reservation owner within the 24-hour window.
• Note: Studies unable to be performed at the time of the scan due to insufficient information provided (related to the participant or protocol) will be subject to the cancelation fee.

• If a scan is being performed and the data cannot be obtained
  ▪ Only the time used before/after resolution of the software/hardware malfunction will be charged.
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• Examples of non-refundable requests:
  ▪ Participant related issues:
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    o Participant Motion
    o Participant requested to stop the scan early

• Examples of refundable requests:
  ▪ Scanner hardware malfunction
  ▪ Cancellation due to upgrades, scheduling concerns, or service
  ▪ Any questions regarding receiving a refund for scan time, should be directed to Seth Smith (Seth.Smith@vanderbilt.edu).

Data Retrieval

• Data is available for retrieval via the web-based application: gStudy
  - Link: https://www.vuiis.org/gstudy/

• If you are unable to find your study: Search * as the study name, select the date your study was performed: This will pull back all scans performed that day. This is helpful in case the ID was mistyped.

• Please note: The Human Imaging Core no longer burns data to disc (CD or DVD) for users.
  ▪ This can be done in the lab using gStudy. Be sure to select DICOM Viewer Tool before preparing the package for download.
  ▪ The core is not responsible for any data transfer to external sites.

• Questions related to gStudy and data retrieval, please contact Baxter Rogers (Baxter.rogers@vanderbilt.edu).
Additional Rooms

The following rooms may be reserved for use at no charge: Mock Scanner (MCN R-0106), OCT Room (MCN AA-0115), HRpQCT Room (MCN AA-0111), Recovery Room (inside the 3TB/7T scanner suite), US/Physiology Room (MCN AA0112), and Experiment room (MCN AA0110).

- Access to the Human Imaging core in iLab is required to view the room calendars and make reservations: https://vumc.corefacilities.org/service_center/3523/?tab=equipment
- No billing number is required; there is no charge for use of these rooms.
- Select the Schedule Equipment tab in Human Imaging core facility page to view the calendars listed below and make reservations.

US/Physiology room (AA0112) and Experiment Room (AA0110)

- These are bookable resources that do not incur a charge.
- Charges will be applied to any resource utilized in the US/Physiology room (Ultrasound, etc.)
  - When booking a resource in the lab, find an open time on both the room and Ultrasound calendars, then book correlating reservations.

Mock Scanner (MCN R-0106)

- Select the Mock Scanner calendar
- Complete all required entries in the reservation form.
- Select Save Reservation.

OCT Room AA00115

- Select the NIRS Equipment & OCT Equipment calendar on the Schedule Equipment tab in Human Imaging core facility page.
- Change the usage type to NIRS Room Only $0.00/hr.
- Billing numbers are NOT REQUIRED to book the room only. However, a billing number may be automatically selected if you have active billing numbers. Please be assured, THERE WILL BE NO CHARGE to that billing number.
- Select Save Reservation.

Experiment Room (AA0111)

- To book this room for experiments, email Vuiis.Hi.MRI@vumc.org
- Include the Date and time of your desired reservation.

Recovery Room (AA0117F)

- Select the Recovery Room calendar
- Complete all required entries in the reservation form.
- Select Save Reservation.
Appendix I: Glossary

**Authorized User (AU):** Physicians who have met the requirements laid out by the US Nuclear Regulatory Commission. All physicians in the VUMC Department of Radiology and Radiological Sciences’ Nuclear Medicine Section are AUs.

**Button boxes:** The button boxes allow the participant to reply to certain stimulus. The boxes are designated for the left and right hands. There is one button for each finger.

**Coil:** The radio frequency receive coil will be specific to the body part being imaged. However, there are multiple options for some body parts. Knowing which specific coil you need is imperative.

**Contrast (MR: Gadolinium):** Contrast agent injections are given through IV and are used for enhanced imaging of blood vessels and certain structures. Dosage is calculated as 1ml per 2.2lbs, based on participant’s body weight.

**Development time:** Development time is used in concert with a VUIIS primary faculty member to develop, implement, test, or evaluate new protocols, patches, functionality that have broad core impact. It cannot be used to supplement studies, and is not provided to develop tools for one’s own project. Development time is available to VUIIS primary faculty members only, so it is required that any user wishing to implement something new partner with a primary VUIIS faculty member to discuss the opportunity to develop new tools that could help the greater human imaging core users.

**ExamCard:** List of the individual scans and their parameter settings for a given scan session (Philips-specific term)

**ExamCard Name:** Every exam will be scanned according to what the PI has designated. The exam card will be specific to each lab, and each study.

Most current exam cards will be found in the ‘Active Studies’ folder. If the exam card you need is in another folder, you will need to know this also.

**Eye Tracker:** Allows users to track eye movement and alertness of participant while scanning. Users are to contact Allen Newton for training on this equipment.

**KSP:** Key Study Personnel as listed on the IRB protocol for a given study

**IRB:** Institutional Review Board

**IACUC:** Institutional Animal Care and Use Committee

**iLab:** Core administration website for scheduling and billing: 
[https://vumc.corefacilities.org/service_center/3523](https://vumc.corefacilities.org/service_center/3523)

**Lab name:** Usually the last name of supervising PI. *(e.g. ‘Smith’ supervised by Seth Smith.)*

**Matching time:** Matching time is provided to new intramural and/or extramural funded projects within VUIIS for you to meet with the technologists, discuss your protocol, scan a phantom to test operation of ancillary equipment, etc. That is, we use this time as a way to communicate scheduled time to make sure your study starts and functions as expected before participants are being enrolled. Matching time is available to all users who have fully funded studies.

**OCT:** Optical coherence tomography

**Opportunistic scanning:** Opportunistic time refers to time available on the scanner when the scanner is not being used. It is intended to be used for users to test ancillary equipment, test parameters on an exam card, or perform phantom studies. Opportunistic scanning is not bookable, and is not available in advance. Opportunistic scan time does not include technologist support, and thus is only available to VUIIS faculty, staff,
and trainees, and cannot be used to scan research participants. If you are collaborating with a VUIIS faculty, staff, or trainee, this is a good opportunity to come into the suite during a slower time and retrieve data, perform reconstructions offline, test a patch functionality, etc. Opportunistic scan time only applies to scans performed during operational hours (i.e. when a technologist is present) and cannot be used for after-hours scanning.

**Patch**: Software patches are created to allow certain parameter changes the scanner would not normally allow. Please know the name of the patch you will be using.

**Philips headphones**: Generic headphones that allow sound to be piped in, and used as stimulus. Participant will be required to use ear plugs with these headphones to protect from excess scanner noises.

**PI**: Principal Investigator; the faculty member responsible for the study

**Project ID**: Every project has to be assigned with a number. All project approvals, and ID’s are assigned once every two weeks. Please be aware these may vary slightly, depending on how the study is being billed.

**Pulse Ox (PPU)**: Pulse oximeter, also known as peripheral pulse unit, is a device placed on participant’s finger to read and record pulse. Pulse is read through the nail bed. Please ask participants to remove all nail polish, or acrylic before arrival if this is an option your study requires.

**Radiotracer/Radiopharmaceutical**: Radioactive drug administered during a PET scan

**RedCap**: REDCap is a secure web application for building and managing online surveys and databases.

**Respiratory band (Bellows)**: Small pillow, strapped to the participant’s stomach, in order to monitor and record participants breathing patterns.

**Scanner room**: the room that holds the MRI scanner itself and lies inside the RF shielding. This room represents the most dangerous space within the MRI environment.

**Scanner suite**: the room immediately outside the scanner room, including the area that holds the stimulus computers and the scanner console

**NNL headphones**: Wired headphones that allow auditory stimulus. Groups that use these headphones are in charge of turning them on and OFF. You are also responsible for sanitizing headphones at the end of each use.

**Stimulus computer**: Each of the 3 scanners has a computer set up provided that allows the user to supply visual, and/or auditory stimulus to the participant in the scanner.

**Study team/personnel**: The Principal Investigator (PI) and all lab members and collaborators directly associated with the study

**Super User**: Several VUIIS faculty members have obtained significant, specialized training beyond standard use cases and can be called upon to support technologists, users, or others to perform scans without a technologist being present. These are called “super-users”. These scan operators can perform scans in healthy volunteers to develop/test/evaluate protocols that improve on core functionality without technologist supervision. However, all scans performed at 7T require a technologist in the suite to assure complete safety. Super-users can also assist other users in setting up protocols or testing patches and are meant to support the operation of the VUIIS technologists not supplant them.
Appendix II: gStudy

gStudy is a web-based application that allows users to access their imaging data (MR & OCT), physiological files, and exam cards:

https://www.vuiis.org/gstudy/

Things you will need:
- Valid VUnet ID
- Study Name (e.g., SMITH_11234)

Step 1: Retrieving Images

MR and OCT data are currently archived on a research PACS server. All image data is stored in DICOM format. Regardless of the format you want to export, you will first need to retrieve the DICOM files associated with your scan from the PACS server.

On the Search tab, enter the information specific to the exam you wish to retrieve.

If you are unable to find your study: Search * as the study name, select the date your study was performed: This will pull back all scans performed that day. This is helpful in case the ID was mistyped.

Tip: For MR images, select “Enhanced,” “Classic,” and “MR” under “DICOM Image Data” to ensure all images are retrieved.

NOTE: Selecting “DICOM Image Data” on this page does not mean the exported data will be in DICOM format. If you want to export the images in DICOM format, you must select “DICOM” during the package preparation step.

Step 2: Prepare Package

On this page, you can select which image series you want to export and the format of the exported data: DICOM (Enhanced or Classic), XMLPARREC (MR only), or NIFTI (MR only)

An optional DICOM viewer (PC only) is available for download with the image data.

Step 3: Download Package

The images will be packaged in a .zip file for downloading.

Questions related to gStudy and data retrieval, please contact Baxter Rogers (Baxter.rogers@vanderbilt.edu).
# Physician Authorization for Research PET

## Participant Information

<table>
<thead>
<tr>
<th>Name:</th>
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<tbody>
<tr>
<td>Date of birth (DOB):</td>
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<tr>
<td>Medical record number (MRN):</td>
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## PET Study Information

<table>
<thead>
<tr>
<th>IRB Number:</th>
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<tbody>
<tr>
<td>VUIIS Project ID (e.g., GOREJ_123):</td>
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<tr>
<td>Radiotracer:</td>
<td></td>
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<tr>
<td>Notes (e.g. dose specifications):</td>
<td></td>
</tr>
<tr>
<td>Scheduled date &amp; time:</td>
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## Referring Physician

<table>
<thead>
<tr>
<th>Signature:</th>
<th></th>
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<tbody>
<tr>
<td>Name (printed):</td>
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<tr>
<td>Date:</td>
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*Note: This form is for PET studies performed at the VUIIS Human Imaging Core ONLY.*
Appendix V: OCT Scan Log Form

General Information

Scan date  ___________________________________________
Scan time  ___________________________________________
VUIIS OCT project number  _______________________________
MRI Scan Number (if applicable)  __________________________

Information from the consent form

PI last name  ___________________________________________
IRB number  ___________________________________________
Consent form expiration date  _____________________________
Last name of study personnel who obtained consent  _______________
Date consent was obtained  ______________________________

Information about the volunteer

Year of birth (enter 1935 if YOB was prior to 1935):  ___________________________
Gender (circle one):  Male  Female
Questionnaire for Budget Requests

Thank you for submitting your request for a budget for an upcoming study. Please complete this questionnaire as completely as possible, as it will expedite the process for getting the proposed budget to you.

1. Who will be the primary investigator for this site?

2. Please list the following KSP along with contact’s phone #...
   a. Study Coordinator:
   b. Other Prescribers/Investigators:
   c. Study Nurses (as appropriate):
   d. Financial Manager:

3. Is this sponsored or non-sponsored research?

4. Will enrollment be during office hours or 24/7?

5. Will enrolled patients be inpatients, outpatients, or both?

6. Where will the patients be located (CRC, OHO, etc...)?

7. When do you plan to begin enrolling patients?

8. How many patients do you expect to enroll?

9. How long will we be enrolling new patients?

10. Will the study use “remote” monitoring (i.e. require IDS to send copies of accountability logs, temp wheels, etc... to a monitor)?

11. When is IRB approval expected or what is IRB#?