

VUIIS Human Imaging Core

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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:

[VUIIS Human Imaging Core Website](#)

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 regarding safety requirements, of their protocol.**

VUIIS project approval

- **ALL studies/scans (human, animal, phantom) performed at the VUIIS HIC must have an approved VUIIS project ID and be booked under the VUIIS-approved project ID:**
 - [New Project Application form](#)
 - Detailed instructions can be found here: [New Project Instructions](#)
 - Applications are reviewed every other week and may require clarification and revisions. Please allow at least 2 weeks before the start of a new study to receive approval.
- **Projects have an expiration date and must be renewed annually.**
 - [Project Renewal Form](#)
 - 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.
 - Project expiration dates for human studies coincide 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.

Book It lab

Reservation calendars for all VUIIS HIC resources are maintained through the [Book It Lab platform](#). All billing goes through the VUMC [iLab system](#).

BIL and Resource calendars

- **Access to the VUIIS HIC resource calendars is restricted to approved users.**
 - When logging in for the first time, you will be prompted to request access to a user group (Lab). Once submitted, the request will be sent to the VUIIS BIL team, the group PI, as well as designated group coordinators.
 - If you cannot find the group you're looking for, please select 'New User Group Request'. We will then reach out to get PI information to create the group and assign you to it.
 - Access requests are monitored regularly. Please allow up to 48 hours for approval.
- **When access is granted, you will be taken to the BIL Dashboard.**
 - On the dashboard, you will find a calendar displaying all resources and a list of all your upcoming reservations.
 - You may view specific and relevant resources by clicking on the reservations tab on the left of the dashboard and selecting the desired resources using the filter to the left of the calendar.
 - The calendar view can also be edited to view by day, week, or month using the timeline dropdown on the right of the calendar.
- **Coordinator Designation**
 - Those listed as user group coordinators will have access to view all the reservations of that group's members.
 - They may also make reservations for group members, listing those members as the reservation owner. Once saved, the coordinator is unable to make any edits to the reservation unless added as a collaborator on the reservation.
 - All PIs are entered as Coordinators. PIs may request that coordinator access be granted to a group member by emailing yuiis.hi.bil@vumc.org.
- **Detailed instrument information can be found by clicking on the resource photo in the calendar or by going to the instrument tab found on the left side of the dashboard.**
 - By selecting an instrument, you will be able to view detailed information about the resource, including a description, the make and model of the resource, its software release, and room number.
 - Documents related to the resource (Worksheets, AU/testing forms, etc) can also be found here.

Reservations

- **Reservations can be made up to 63 days in advance.**
 - Each day opens in its entirety at 8 am.
- **Reservations can be made from any calendar view by clicking on the desired start time and dragging to the desired end time.**

- Adjustments to date and time can be made on the reservation sidebar.
 - Please keep in mind that while some resources are available to be booked on the quarter hour, some only allow reservations on the hour and half hour.
 - Reservations require the entire reservation side bar be filled out completely before you will be able to save the reservation. This includes User Group, Cost Center, Project ID, and any custom form information.
 - Reservation owners will be able to add collaborators from their user group to their reservation.
 - Collaborators will have the same rights as the reservation owner to edit and cancel a reservation.
 - Visit the PET/CT and X-Ray sections for more information on their specialized calendars.
- **Reservations can be transferred to other users in BIL.**
 - Reservations can be transferred to any other user in BIL. This can be done by clicking on the reservation to open its details. The transfer option can be found by selecting the 3 dots button at the bottom of the reservation sidebar.
 - The user receiving the reservation can accept or reject the transfer.
 - Transfers may also be cancelled using the transfer details found at the top of the reservation sidebar once initiated.
 - Transfers made within the cancellation period will not incur a cancellation fee.
 - **Users can make reservations for all 3 types of reservations (Paid, Matching, and Development).**
 - While Matching and Development reservations do not incur a charge, they do still require a cost center to be selected.
 -
 - **Reservation times must include all aspects of scanning, not just study length/scan time.**
 - Reservation length should be made to include time for the technologist to review the participant redcap form, time for the participant to change, software adjustments, getting the participant set up for their study, time to set up any required ancillary items required, explanation of the study or task to the participant, study time/scan length, time to get the participant up and oriented, as well as time to sanitize items used for the study. (Not all actions listed will apply to all studies.)
 - Reservations have a hard stop time. Technologists will not run over the reservation end time.
 - Reservations may be extended to accommodate any study running late, if the schedule allows.
 - **Reservation history can be viewed by going to the reservations tab on the left side of the dashboard, then selecting 'Reservation History'.**
 - Here you can see past reservations and their status.
 - **The wait list, also found under the reservations tab, allows users to sign up to receive notice of a cancellation for specific resources by defining the reservation length needed and the length of time they wish to receive the notices.**

Billing

- See [iLab](#) for current rates.
- All matters related to funding sources in BIL should be sent to the [VUIIS BIL Team](#).
- All matters related to funding sources in ILab should be sent to the [Office of Research](#).
- Contact [Jarrod True](#) with any questions regarding invoices from the Human Imaging Core.

iLab

- VUMC Customers:
 - Billing numbers are entered into Workday by the PIs Department Admin. iLab retrieves cost center information from there.
 - Please contact your local administrative team for assistance with getting center numbers entered in iLab.
 - Questions regarding cost center numbers in iLab should be directed to the Office of Research (VumcCores@vumc.org).
- VU Customers:
 - VU billing numbers (CoA or POET numbers) are entered as PO's.
 - New PO's and changes to existing PO's must be entered by the VUMC Office of Research.
 - [Office of Research VU billing numbers management information](#).
 - [VU Billing Number change for use in VUMC Core Groups \(VUMC iLab System\)](#)
 - For questions or assistance: VumcCores@vumc.org
 - Please note: scholarships, vouchers, and VA billing numbers will be entered into the system for the users by the Office of Research.
 -

BIL

- **Once center information has been entered into Workday and is visible in iLab, PIs will submit center information to be entered into Book It Lab.**
 - [Cost Center BIL Entry Form](#)
 - Please allow 48 hours for the center to be available in BIL.
- Contact the [VUIIS Book It Lab team](#) with any questions regarding the BIL platform.
- Contact [Jarrod True](#) with any questions regarding invoices and billing from the Human Imaging Core.

Cancellations and Refunds

- **Cancellations made within 72 hours of the reservation start time will be charged a cancellation fee equal to that of the reservation.**
 - Reservations can be cancelled by the reservation owner and any listed collaborators.
- **If a reservation must be cancelled by the user group within 24 hours of actual scan time, please notify the technologist by phone or email:**
 - MRI: Vuiis.Hi.MRI@vumc.org

- PET/CT: Vuuis.Hi.PETCT@vumc.org
- DXA/HRpQCT/XRV/Ultrasound: Vuuis.Hi.DXA.US@vumc.org
 - **Note:** Studies unable to be performed at the time of the scan due to insufficient information provided (related to the participant or protocol) or screening failure will be subject to the cancellation fee.
- **If a scan is being performed and the data cannot be obtained:**
 - Only the time used before/after the 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 and will not incur a charge.
- **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
 - Emergencies where a technologist is not available.
 - Cancellation due to upgrades, scheduling concerns, or service
- **Reservations will be extended and charged accordingly for any scan that extends past the booked reservation time.**
- **Any questions regarding refunds should be directed to [Seth Smith](#).**

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 University Children’s Hospital (VUCH) 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. They may not be 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 de-identified using Recap forms and do not include any PHI.**
- **The VUIIS PACS system does not communicate with VUMC.**

- 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.
- **Radiologist reads can be arranged with a fee-for-service agreement with a VUH Radiologist.**
 - **MR studies:** Contact [Seth Smith](#) for suggestions of radiologists whose specialties are relevant to your study.
 - **PET studies:** Contact [Todd Peterson](#) or [Dr. Philip Scherer](#) Dr. Gary Smith (Nuclear Medicine & PET/CT Section Chief). To inquire about obtaining image reads, please visit: <https://www.vumc.org/radiology/person/nuclear-medicine-and-petct>
 - If arrangements for official reads have been made, it will be the responsibility of the study team to send images to the radiologist for viewing.

eStar

- **The Human Imaging Core is not a clinical department; therefore, our staff has either no access or very limited access to the VUMC electronic medical record system, eStar.**
- **Study personnel are responsible for any study-related documentation and ordering in the participant’s medical record.**
-

Participant communication & chaperoning

- **Someone listed as Key Study Personnel (KSP) on the IRB must remain in the imaging suite for the entire reservation.**
- **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 the reservation.**
- **Please limit the number of people attending the reservation.**
 - When possible, caregivers and family members accompanying participants should remain in the VUIIS or VUH lobby.

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.

- **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](#)**
 - A VPN connection is required to access gStudy.
 - A DICOM viewer is also available for download (PC only).
- **Please note: The Human Imaging Core does not burn data to discs (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.**
 - Technologists are not responsible for data transfer to any 3rd party.
- **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](#).**

MRI (AA00117 & VUH B160)

Contact

- Vuuis.Hi.MRI@Vumc.org
- 3TB Ext: 67253
- 3TA Ext: 25073
- 7T Ext: 67257

New User Requirements

- **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 and a green approval sticker on the back of their badge.**
 - [MRI User Magnet Safety Screening Form.](#)
 - VU/VUMC staff and faculty are screened by Occupational Health.
 - Trainees are screened by our technologists.
 - The screening form linked above will direct you to the appropriate form.
- **Once users have been screened and approved for working in the MRI environment, they will need to obtain a green sticker from Occupational Health or VUIIS to place on the back of their badge, indicating their MRI screening status.**
- **Users are responsible for keeping their form up to date. Any change in surgical history, metal injury, or implant status will need to be reported and screened before returning to the MRI Zone 4.**

Please note that having participants fill out this form at the scanner may increase the risk of screening failure and will eat into your reservation time. It is advised that this form be completed and reviewed by KSP at least a week before the participant's scheduled scan.

Safety video/Education

- **All users are required to watch the [MRI safety video](#).**
 - 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](#)
 - A link to a recorded version of 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:
[MRI Zoom Recorded New User Course](#)

Expectations

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

- **KSP attending the scan are expected to de-metal upon arrival and remain de-metaled for the duration of the reservation. This ensures KSP can enter the MRI room without issue should the technologist need immediate assistance.**
 - KSP attending the scan are expected to work with technologists to learn how to assist with room setup and breakdown for their project.
- **Technologists are available to meet with users starting an unfamiliar study or who are new to VUIIS to discuss their protocol/needs.**

Safety issues

- **The greatest concern when entering the MRI scan room is the potential of bringing dangerous ferromagnetic material into the room.**
 - The scanner can have adverse effects on many everyday items often forgotten in pockets.
- **All those entering the MRI room must de-metal (i.e., empty pockets, remove watches, ferrous jewelry, hair clips/bobby pins, and other accessories). 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, loose hanging jewelry, clipboards, bobby pins, and 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.), hair clips or claws.
 - 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 does not provide in-house pregnancy testing.**
- **VUIIS expects pregnancy testing for individuals of childbearing potential to be addressed in the protocol approved by the IRB.**
- **Pregnancy testing is required for participants of childbearing potential for studies being performed at 7T and studies requiring a Gadolinium contrast injection.**
- **It is expected that users adhere to the guidelines set forth by the IRB-approved protocol to ensure participant safety and study eligibility.**

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 the IRB-approved protocol.**
- **VUIIS does not provide in-house GFR testing but requires documentation of safety to administer Gadolinium to those who fall into the [ACR GFR testing guidelines](#).**

Scheduling

Scheduling is managed through our resource calendars on the [BIL site](#). In MRI, there are 3 types of reservations: paid, matching, and development.

General scheduling information

- **The reserved time covers ALL activities done in the scanner suite or in the scanner room.**
 - Reservations must include time for:
 - The MRI tech to check the MRI screening form.
 - Ensure the participant has been de-metaled and changed into a gown or paper scrubs
 - Please consider that extra time may be needed for participants with mobility issues.
 - Hoyer lifts are available for participants with severe mobility issues. VUMC users may order a lift for the time of their reservation through the Epic System. VU users may call 615-766-6709 to schedule lift delivery and pick up.
 - Scanner software patch change (If using a patch other than Default)
 - Room and experiment setup
 - Participant briefing
 - Software patch change back to Default
 - Post-scan cleaning procedures.
- **Scans with human subjects are required to stop scanning 3-5 minutes before the end of the reservation time to ensure time for getting the participant up and cleaning procedures.**
- **Scans with Animal subjects are required to stop scanning at least 30 minutes before the end of the reservation time to ensure sanitization requirements can be met.**
- **Reservations are made at a minimum of one hour and extend every half hour thereafter.**
 - Half-hour gaps in appointment times should be avoided. Habitual gaps may result in a charge for those 30 minutes.
- **An active VUIIS project ID and Cost Center are required to save a reservation.**
 - Technologists do not book place holders for any reason. Project IDs and cost center numbers must be active for a reservation to be made.
 - Questions regarding project approval/renewal and missing project IDs to the [Study Review Team](#).
- **When scheduling:**
 - Reservations require a project ID, coil selection, software patch, and cost center to be charged.
 - Boxes and drop-downs include extra available resources (Button boxes, NNL...)
 - PHI is not allowed to be entered into the reservation details.
 - Including the participant's name, date of birth, medical record number, etc.
- **Placeholder reservations (reservations without a confirmed participant) are not allowed.**
 - Placeholder reservations prevent other groups from having fair access to the scanners.
 - Cancellation of placeholder reservations results in unused scan time that other groups could utilize with notice

- 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.
- Technologists do not make placeholder reservations for expired project Id's or cost centers. Both must be active to make a reservation.

Matching and Development reservations

• Matching time

- Matching time is provided to new intramural and/or extramural funded projects within VUIIS to assist with getting started.
 - Matching time is not available for clinical trials.
- This time is to be used to help get studies started and functions as expected before participant enrollment.
 - Matching time uses include meeting with technologists to discuss and build protocols, performing test runs of the study, to test the operation of ancillary equipment, etc.
- Matching time is offered as a courtesy. As it is meant to help new projects just getting started, it expires on the date listed in the New Project Approval and is **not refundable**.
 - Any scan hours remaining on the account at the time of expiration will become invalid and will not be accessible past that date.

• Development time

- Development time is used in concert with a VUIIS primary faculty member to develop, implement, test, or evaluate new protocols, patches, and functionalities that have a broad core impact.
- Development time may not 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
 - Users wishing to implement new techniques may partner with a primary VUIIS faculty member to discuss the opportunity to develop new tools that could help the greater human imaging core users.
- These projects are refundable using the project renewal form.

Opportunistic scanning

• Opportunistic time

- Users are permitted to run phantom scans, test stimulus paradigms, retrieve data, test patches, perform offline reconstructions, and build protocols during business hours, when a scanner's resource calendar is not reserved, and the scanner is not in use.
 - Times that are booked for "Phantoms" also fall into this category.
 - Not available during off-hours.
- Opportunistic time does not include technologist support; as such, it is only available to VUIIS faculty, staff, and trainees.
- The scanning of human subjects is prohibited when using opportunistic time.
 - Reservations are required for technologist support and live subjects.
- Technologists must be present in the area to gain access to the MRI room for phantom scanning and in-room equipment testing.
- Opportunistic scanning is not bookable and operates on a first-come, first-served basis.

- When opportunistic time is available, a sign-up sheet will be posted on the door outside the 3Tb/7T scanner suite (Room AA0117) for all 3 MRI resources.
- Slots cannot be held without being billed.
- *Core staff, Philips support team, and paid reservations take priority and may result in being bumped off the schedule*
- Opportunistic scan users are responsible for room set-up/breakdown, data transfer, and returning the software patch to Default.
- All opportunistic scans must be finished and cleared out of the scan area 5 minutes before the 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**, and phantoms should be properly stored.
- The 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.
- MRI technologists must be notified immediately with a detailed description of any issues via email (Vuuis.Hi.MRI@vumc.org).

Billing and Cancellation fees

Billing

- See [iLab](#) for current rates.
- All matters related to funding sources in BIL should be sent to the [VUIIS BIL Team](#).
- All matters related to funding sources in ILab should be sent to the [Office of Research](#).
- Contact [Jarrod True](#) with any questions regarding invoices from the Human Imaging Core.

Cancellations

- **Cancellations made within 72 hours of the reservation start time will be charged a cancellation fee equal to the cost of the reservation.**
 - Cancellations can be made by the owner of the reservation, reservation collaborators, and PIs.
- **Technologists should be notified if a reservation will be cancelled within 24 hours of the scan time.**
 - Note: Studies unable to be performed at the time of the scan due to insufficient information provided (related to the participant or protocol) or screening failure will be subject to the cancellation fee.
- **If a scan is being performed and the data cannot be obtained:**
 - Only the time used before/after the 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 and will not incur a charge.
- **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
 - Emergencies where a technologist is not available.
 - Cancellation due to upgrades, scheduling concerns, or service
- **Reservations will be extended and charged accordingly for any scan that extends past the booked reservation time.**
- **Any questions regarding refunds should be directed to [Seth Smith](#).**

Participant MRI Screening

- **Each participant must complete a new [MRI Screening Form](#) for EVERY study.**
 - This form is a requirement to be eligible for an MRI scan. This form will be 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.**
 - Instruct the participant to click **Save and Return Later** after completing their portion of the form to generate their unique return code.
 - The KSP should check this form, using the return button at the top right of the form, at least 1 week before the participant's reservation.
- **Call special attention to any questionable implant/surgery/injury as soon as possible.**
 - Every attempt should be made to raise concerns at least 1 week before the participant's reservation.
- **Pre-screening can be requested on the second page of the safety screening form.**
 - Redcap forms with requests for electronic implant review **MUST** be submitted 30 days before the participant's study and require a meeting with MRI technologists.
 - Participants with ICD's (pacemakers) or abandoned ICD leads are not eligible for MRI scans at VUIIS.
- **As much information as possible on the surgery/implant/injury in question should be provided and uploaded to the screening form.**
 - Please ensure all items on the form are consistent with any reported surgeries and/or implants.
 - This means ensuring that any implants reported in the surgery section are reflected in the checkboxes and expanded upon in the implant's comment box.

- The MRI technologists will review the information and reach out if more information is required 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: Several things are considered when clearing surgeries and implants. These things include the study protocol, patch, implant location, scan location etc... This can create a vast amount of variation between studies. Not every implant or surgery is allowable in every instance. We may approve a participant or implant for one study and not for another. This is not meant to imply we are picking and choosing between labs, but rather looking at the whole picture and clearing participants with the highest regard for their safety. 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.**
 - It is the KSP's responsibility to provide the technologist with the information they need to accurately perform each study.
 - An [MRI Worksheet](#) is available as a tool for users to communicate their unique study requirements to the technologists.
- **Additional documentation, such as pregnancy and/or GFR testing, may be required for contrast administration.**
- **Previous scan history outside of VUIIS does NOT automatically clear a participant for scanning at VUIIS.**
- **Subsequently, a participant cleared for a study with us of one body part may not be cleared for a study scanning a different body part based on surgical/implant/injury history.**

***Screening for 3T and 7T requires different considerations. Users cleared for 3T scans may not be eligible for 7T scans. ***

- **The animal screening form can be found [here](#).**

Expectations

- **Please be respectful and maintain a professional decorum.**
 - We scan a diverse population of volunteers, including young children, participants with mental disorders, and those with very serious illnesses. Many of whom are not as comfortable in the scanning environment as we are.
- **To ensure participant privacy, arrival time should be no more than 5 minutes before the reservation start time.**
 - Please ask the participant and anyone accompanying them to wait in the VUIIS lobby or the VUH 1st floor waiting room until the reservation starts.

- The VUIIS waiting areas have limited space/seating. Please consider using other locations if your participant has several people accompanying them.
 - Please respect any drawn curtains, shut doors, or signs related to entry. If you need to speak with one of the technologists prior to your appointment time, please reach out to them via phone call.
- **Personnel attending the study are required to de-metal upon arrival and remain de-metalled until the participant is safely out of the MRI room.**
 - In the event there is an emergency, study personnel must be prepared to enter the scan room and assist the technologist.
- **Access will not be given to the scanner suite or technologists for equipment setup or screening form approval before the start of the reservation.**
 - This is not calendar-dependent.
- **Scanning end 3-5 minutes before the end of a reservation for human/phantom studies.**
 - Active scanning must stop 3 -5minutes before the end of the reservation time to get the participant/phantom/sample off the table, perform any specialized data export, and implement sanitization protocols.
 - Any scan that goes over its allotted time will be subject to:
 - Availability of the scanner (the next user will not be infringed upon).
 - Additional charges for additional scan time utilized.
 - Immediate stoppage (please structure your Exam Card in descending order of importance).
 - Delayed data transfer/handling
 - NHP scans must stop 30 minutes prior to the end of their reservation time to allow for proper cleaning protocols.
- **KSP is REQUIRED to know the IRB and study protocol.**
 - It is the responsibility of KSP attending studies to know what is in their IRB protocol and be able to communicate study requirements to technologists.
 - The MRI Worksheet can be filled out and brought to each reservation for technologists to use as a reference when performing the study.
 - 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 in relation to pregnancy testing at the 7T.
 - VUIIS expects pregnancy testing for individuals of childbearing potential to be addressed in the lab's protocol approved by the IRB. This is required for studies being performed at 7T and studies requiring a Gadolinium contrast injection.
 - It is expected that users adhere to the guidelines set forth by the IRB-approved protocol to ensure participant safety and study eligibility.
 - VUIIS does not provide in-house pregnancy testing.
- **Assistance on how to amend IRB protocols and guidance on verbiage, please contact [Seth Smith](#).**

Scan room setup/breakdown

- **KSP is expected to assist technologists during setup AND breakdown.**
 - To maximally utilize reservations KSP are asked to assist the technologist in preparing the room for the study.
 - When changing coils: 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. Torquing 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.
 - The scan table, coil, cushions, pads, and any ancillary items used are to be cleaned with a sani-wipe out of the purple top wipe container. *Must wear gloves before touching wipes*

- **VUIIS provides the resources for scanning only.**
 - KSP are responsible for setting up projectors, button boxes,>NNL headphones, or any other ancillary equipment and coaching participants.
 - Inability to communicate the study’s needs and requirements will affect the technologist's ability to perform the study.
 - Refunds are not given for these reservations.

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:

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

- **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.
 - Scans remain on the console until they have been confirmed in PACS.
 - Scans are typically confirmed and removed from the console within 5 days of the study.
 -
- **Data archival is performed as a courtesy and is not guaranteed.**
 - Please ensure you are reviewing your study as soon as possible post scan to ensure nothing is missing.
- **MR images and other related data are available for retrieval via the web-based application: [gStudy](#).**
 - Note: VPN connection is required to access 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 unable to find a study in PACS: 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 does not provide images outside of gStudy.**
 - Any required disks/USB's needed for study transfers 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 Exam Card parameters to ensure the correct parameters and values are exported.
 -
- **Sequences must be exported individually.**
 - The exam card 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)
- **Reach out to [Baxter Rogers](#) with questions related to gStudy and data retrieval.**

S10 Citations

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

MR: 3Ta Philips Elition 3.0T	1S10OD021771-01
MR: 7T	1S10RR023047-01
General Citation	This work was performed using instruments housed in the Vanderbilt Center for Human Imaging.

Contact

- Vuuis.Hi.PETCT@Vumc.org
- Ext: 56399

The Human Imaging Core operates a Philips Veros 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 for studies with both human and animal subjects.

Getting Started

Step 1: Protocol development

- **Prior to initiating a study, investigators should contact [Todd Peterson](#), VUIIS Director of Nuclear Imaging & Radiochemistry, 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 study's IRB.**
 - 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.
 - PET director Todd Peterson and VUIIS technologists may not be named as AU.
- **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.**
- **AU's are not required to be present for scans.**
 - Technologists will inform the AU 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. This AU will be contacted in the event of an adverse event.
- **The current list of AUs in the Nuclear Medicine Section can be found [here](#), under "Section Chief and Members."**
 - For assistance securing an AU please reach out to [Dr. Gary Smith](#) or [Todd Peterson](#).

Investigational Drug Service

- **All studies* using radiopharmaceuticals are required to register with the Investigational Drug Service (IDS).**
 - A copy of the IDS form can be found on [Appendix III](#) of this document.
- **A copy of the completed form is required to be sent to [Donna Torr](#) before 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

- Once a new project has been approved, contact the [PET/CT technologists](#) and [Todd Peterson](#) to assist in setting up your protocol on the scanner.

Scheduling

Scheduling is managed through our resource calendars on the [BIL site](#).

Accompanied Services

- There are four accompanied services when making a reservation on the PET/CT scanner: CT Only, Injection No Scan, Injection With Scan, and PET/CT.

CT Only

- The purpose of this usage type is to reserve time associated with the scanner.
- Reservations are made at a minimum of 30 minutes and extend in 30-minute increments thereafter.
- **If Iodinated Contrast is required:**
 - Venipuncture is offered by the technologists at the time of the study.
 - To ensure the safety of participants, all injections will be made through peripheral IV access.
 - Injections may not be made through any access other than a peripheral IV (Port, PICC, etc..)
- **Reservations must 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 may require additional time for setup before and cleaning according to SOP after the scan.
 - 30 minutes are to be allotted to wake animal subjects from anesthesia in the PET/CT room.

Injection No Scan

- The purpose of this service is to reserve the technologist's time for the injection of the radiotracer without PET imaging.
- Reservations are made at a minimum of an hour and extend in 30-minute increments thereafter.
- Technologists can assist with participant monitoring post-injection, phlebotomy, vital signs, ECG tracing, or urine collection.
- To ensure the safety of participants, all injections will be made through peripheral IV access.
 - Venipuncture is offered by technologists at the time of the study.
- Injections may not be made through any access other than a peripheral IV (Port, PICC, etc..)

- Please adhere to injection reservation times. Late arrivals may not be injected due to tracer decay.

Injection With Scan

- The purpose of this service is to reserve the technologist's time for the injection of the radiotracer PET imaging requires an uptake time after injection.
- Reservations are made at a minimum of an hour and extend in 30-minute increments thereafter.
- There is no charge for this usage type.
- To ensure the safety of participants, all injections will be made through peripheral IV access.
 - Venipuncture is offered by technologists at the time of the study.
- Injections may not be made through any access other than a peripheral IV (Port, PICC, etc..)
- Please adhere to injection reservation times. Late arrivals may not be injected due to tracer decay.

PET/CT

- The purpose of this service is to reserve time associated with the scanner for PET and PET/CT scanning.
- Reservations are made at a minimum of an hour and extend in 30-minute increments thereafter.
- If Iodinated Contrast is required:
 - Venipuncture is offered by the technologists at the time of the study.
 - To ensure the safety of participants, all injections will be made through peripheral IV access.
 - Injections may not be made through any access other than a peripheral IV (Port, PICC, etc..)
- Reservations must 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 may require additional time for setup before and cleaning according to SOP after the scan.
 - 30 minutes are to be allotted to wake animal subjects 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.
- Users are prohibited from entering private health information (PHI), such as the volunteer's name, date of birth, medical record number, etc., in reservation details.
- **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.

- **Technologists will not make place holder reservations for users who have expired project Id's or cost centers. Both must be active to make a reservation.**

Billing and Cancellation fees

Billing

- See [iLab](#) for current rates.
- All matters related to funding sources in BIL should be sent to the VUIIS BIL Team.
- All matters related to funding sources in ILab go through the [Office of Research](#).
- Contact [Jarrod True](#) with any questions regarding invoices 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](#) in the Radiochemistry Core.

Cancellations

- **Cancellations made within 72 hours of the reservation start time will be charged a cancellation fee equal to that of the reservation.**
 - Reservations can be cancelled by the owner of the reservation, reservation collaborators, and PIs.
 - If a scan requiring a radiotracer is canceled, the PET technologists **must** be notified by email so the radiotracer can be canceled.
- **Technologists are to be notified if a reservation will be cancelled within 24 hours of the scan time.**
 - The technologist must be notified by phone that your scan is cancelled, followed by an email to (Vuiis.Hi.petct@vumc.org).
 - Note: Studies unable to be performed at the time of the scan due to insufficient information provided (related to the participant or protocol) or screening failure will be subject to the cancellation fee.
- **If a scan is being performed and the data cannot be obtained:**
 - Only the time used before/after the 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 and will not incur a charge.
- **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
 - Emergencies where a technologist is not available.
 - Cancellation due to upgrades, scheduling concerns, or service
- **Reservations will be extended and charged accordingly for any scan that extends past the booked reservation time.**
- **Any questions regarding refunds should be directed to [Seth Smith](#).**

Radiotracers

- **Technologists are to be alerted directly if a study needs to be cancelled or rescheduled.**
 - Failure to do so may result in charges for the unused radiopharmaceutical.
- **Radiotracers ordered from the Radiochemistry Core:**
 - Labs are responsible for alerting the Radiochemistry Core to any changes in the reservation date/time or cancellations:
 - Changes to and cancellations of reservations must be communicated to [YY Cheung](#).
 - Note: The Radiochemistry Core has a 24-hour cancellation policy.

Required Preparations for a PET Study

The following steps are **required** when making reservations.

Radiopharmaceutical Order (Human PET studies only)

- **Radiopharmaceuticals are considered drugs by the FDA; therefore, a physician-signed order is required for dispensing radiopharmaceuticals for all PET scans.**
- **The form in [Appendix III](#) must be completed for each scan and uploaded to the PET/CT screening form.**
- **IMPORTANT: This order is for documentation purposes only. It does not result in the ordering and/or dispensing of the radiotracer. See the next section for more information on acquiring radiotracers.**

PET/CT pre-scan form (ALL studies)

- **Each participant must complete a new [PET/CT screening form](#) 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.
- **Screening forms must be completed before the reservation time.**

- Once complete, click [Save and Return](#) to generate the form's return code.
- 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)

- Radiotracers are ordered after the screening form is submitted for review.
- Radio tracers not produced by the VUIIS Radiochemistry Core will be ordered by technologists.
- Radiotracers are ordered at least five days before the injection/scan date.
- If the nuclear pharmacy requires more than a five-day lead time, the PET technologists will notify the study coordinator.
- The procedure for acquiring radiotracers is dependent on the source of the tracer.
 - Contact the [PET/CT technologists](#) or [Todd Peterson](#) for assistance when unsure of the radiotracers' supplier.

Radiochemistry Core

- Labs are responsible for ordering radiotracers supplied by the VUIIS Radiochemistry Core.
 - Orders are placed in [iLab](#).
- Questions regarding tracer production and pricing can be sent to [Todd Peterson](#), Director of the Radiochemistry Core.

PETNET & Other outside suppliers

- Human Imaging Core staff will order radiotracers supplied by PETNET.
- [Service requests](#) with the Radiochemistry Core is required for billing & delivery.

Pregnancy testing (Human scans only)

- **Pregnancy testing is required for all participants of child-bearing potential before receiving ionizing radiation from a radiotracer or X-Ray.**
 - Tests are required to be within 24 hours of the scheduled scan and available for review in the participant's medical record.
 - Serum testing is preferred as urine may be too diluted for reliable results; 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 the IRB to ensure participant safety and study eligibility.
- VUIIS does not provide pregnancy testing.

General information

- **Someone listed as KSP on the IRB must remain in the PET suite for the entirety of the reservation.**
- **Lab members are responsible for all communication with the participant, including appointment reminders and any instructions related to the study (e.g., fasting, other testing, etc.).**
- **Be respectful and maintain a professional decorum.**
 - The waiting area for the PET suite is a shared space with the adjacent VUIIS MR scanner suite.
 - We scan a diverse population of participants, including young children and persons with mental disorders and very serious illnesses. Please keep this in mind in and around the scan suites.
- **To ensure participant privacy, please do not arrive with your participant until the beginning of your appointment time.**
 - Participants and those who may be accompanying them are welcome to wait in the main hospital lobby or your designated meeting place until the reservation time.
- **Please respect any drawn curtains or shut doors.**
 - Technologists can be reached via email if you need to speak with them prior to your appointment time.
- **Time in the scanner area begins at the scheduled appointment time.**
 - Access to the scanner suite or technologists for equipment setup will not be permitted before the scheduled appointment, even if there is no scan booked upon arrival. (removed first person)
- **Know your IRB and study protocol.**
 - It is the lab's responsibility to know what is in the study's IRB protocol.
 - For advice on how to amend the IRB protocol and guidance on verbiage, contact [Todd Peterson](#).
- **The PET technologists can assist with general phlebotomy.**
 - Blood collection tubes must be supplied by the lab.

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](#).**
 - Note: VPN connection is required to access 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 Core does not provide images outside of gStudy.
 - Any required disks/USB's needed for study transfers can be done in the lab using gStudy. Be sure to select DICOM Viewer Tool before preparing the package for download.
- **Questions related to gStudy and data retrieval can be directed to Baxter Rogers.**

DXA (AA0124), HRpQCT (AA0111), X-Ray Velocimeter (AA0112)

Contact

- Vuuis.Hi.XRay@Vumc.org

Scheduling

Scheduling is managed through our resource calendars on the [BIL site](#).

- **There is currently one technologist running DXA, HRpQCT, and the XRV scanners.**
 - When making reservations for DXA, HRpQCT or XRV, use the ‘Reservations’ tab located to the left of the screen.
 - Using the ‘Filters’ tab on the left side of the screen, select all 3 resources. This will allow you to see all of them at once to ensure the timeslot you are interested in is available on all resources.

- **Reserved time covers ALL activities done in the scanner suite or in the scanner room:**
 - Reservations should include time for the technologist to review the participant screening form, position the participant, total scan time, analyses/evaluation, 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 in 15-minute increments.**
- **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.
 - **Technologists will not make placeholder reservations for users who have expired project Id’s or cost centers. Both must be active to make a reservation.**

- **Custom form requirements must be entered to save reservations.**
 - Any post-processing requests 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 BIL should be sent to the [VUIIS BIL Team](#).
- 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](#) with any questions regarding invoices from the Human Imaging Core.

Cancellations

- **Cancellations made within 72 hours of the reservation start time will be charged a cancellation fee equal to the cost of the reservation.**
 - Cancellations can be made by the owner of the reservation, reservation collaborators, and PIs.
- **Technologists should be notified if a reservation will be cancelled within 24 hours of the scan time.**
 - Note: Studies unable to be performed at the time of the scan due to insufficient information provided (related to the participant or protocol) or screening failure will be subject to the cancellation fee.
- **If a scan is being performed and the data cannot be obtained:**
 - Only the time used before/after the 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 and will not incur a charge.
- **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
 - Emergencies where a technologist is not available.
 - Cancellation due to upgrades, scheduling concerns, or service
- **Reservations will be extended and charged accordingly for any scan that extends past the booked reservation time.**
- **Any questions regarding refunds should be directed to [Seth Smith](#).**

Scanning

- **Each participant must complete a new screening form for EVERY study.**
 - [DXA Screening Form](#)
 - [HR-pQCT Screening Form](#)
 - [XV Screening Form](#)

Expectations

- **Know your protocol.**

- You will be expected to communicate with the technologist what scans are to be performed (femur, wrist, etc.), which extremity is to be scanned (left vs right), provide an updated height and weight of the participant, as well as any post-processing needs.
 - Worksheets are available for [DXA](#) and [X-Ray Velocimeter](#) studies to assist in providing technologists with study requirements.
- **To ensure patient privacy, please do not enter the scanner area with your volunteer until the beginning of your appointment time. Early arrivals will be sent to wait in the VUIIS lobby.**
- **Arriving more than 10 minutes late may preclude the technologist from being able to complete the study.**
 - Late arrivals impede the technologist's ability to complete quality scans and post-processing analysis.

Pregnancy testing (Human scans only)

- **Pregnancy testing is required for all female participants of childbearing potential before administration of radiation.**
 - DXA: Results should be within 7 days of the scheduled scan.
 - XV: Results should be within 3 days of the scheduled scan.
 - Results from serum testing are preferred as urine may be too dilute for reliable results; 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 or XVR Scanning is not included in the approved protocol, VUIIS will require a pregnancy test to be performed before scanning.**
- **VUIIS does not provide in-house pregnancy testing.**

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.
- **Printouts with various measurements are available at the end of the DXA reservation. These are also available on [gStudy](#).**
- **DXA images are available for retrieval via the web-based application: [gStudy](#).**

- Note: VPN connection is required to access 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 Core does not provide images outside of gStudy.
 - Any required disks/USB's needed for study transfers can be done in the lab using gStudy. Be sure to select DICOM Viewer Tool before preparing the package for download.

- **Questions related to gStudy and data retrieval can be directed to Baxter Rogers.**

Ultrasound (AA-0112)

Contact

- Vuuis.Hi.XRay@vumc.org

Scheduling

Scheduling is managed through our resource calendars on the [BIL site](#).

- **The Ultrasound machine can be found in the X-Ray Velocimeter Room (AA-0112).**
 - Without a reservation, the Ultrasound machine will be inaccessible.
 - Power cords and transducers can be found in the cabinet to the right of the door upon entry. If the US cabinet is not unlocked, check across the hall with the MRI technologists in room AA-0117.
- **Ancillary Experiment room AA-0115 is a free resource that can be booked in tandem with the US machine for studies requiring a patient bed.**
- **The machine must be picked up and returned based on the reservation time.**
 - Billing rates will be based on actual usage of the machine

Billing and Cancellation fees

Billing

- See [iLab](#) for current rates.
- All matters related to funding sources in BIL should be sent to the [VUIIS BIL Team](#).
- 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](#) with any questions regarding invoices from the Human Imaging Core.

Cancellations

- **Cancellations made within 72 hours of the reservation start time will be charged a cancellation fee equal to the cost of the reservation.**
 - Cancellations can be made by the owner of the reservation, reservation collaborators, and PIs.
- **Technologists should be notified if a reservation will be cancelled within 24 hours of the scan time.**
 - Note: Studies unable to be performed at the time of the scan due to insufficient information provided (related to the participant or protocol) or screening failure will be subject to the cancellation fee.
- **If a scan is being performed and the data cannot be obtained:**
 - Only the time used before/after the 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 and will not incur a charge.
- **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
 - Emergencies where a technologist is not available.
 - Cancellation due to upgrades, scheduling concerns, or service
- **Reservations will be extended and charged accordingly for any scan that extends past the booked reservation time.**
- **Any questions regarding refunds should be directed to [Seth Smith](#).**

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.
- **Images are available for retrieval via the web-based application [gStudy](#).**
 - Note: VPN connection is required to access 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 Core does not provide images outside of gStudy.
 - Any required disks/USB's needed for study transfers can be done in the lab using gStudy. Be sure to select DICOM Viewer Tool before preparing the package for download.
- **Questions related to gStudy and data retrieval can be directed to Baxter Rogers.**

Additional Rooms

- **The following rooms may be reserved for use at no charge:**
 - Mock Scanner (MCN R-0106)
 - Ancillary Experiment Room AA-0110 (VUIIS)
 - This Room houses a table and chairs for participant testing and interviews, as well as a leg exercise machine for physiology testing.
 - Ancillary Experiment Room AA-0115 (VUIIS)

- This room contains an electric massage therapy bed, a digital scale, a small table, and chairs.
- B-168 Ancillary testing room (3TA Corridor).
 - Contains a table and chairs.
- **Access to the Human Imaging core in [BIL](#) is required to view the room calendars and make reservations.**
- **No billing number is required; there is no charge for use of these rooms.**

OCT

- **For access and information on OCT and how to use it, please reach out to [Seth Smith](#) or the [X-Ray technologists](#).**

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 AU's.

Book It Lab (BIL): VUIIS Human Imaging Core website for resource scheduling.

Button boxes: Button boxes allow participants to reply to certain stimuli. The boxes are designated for the left and right hands. There is one button for each finger. The numbering system for the buttons range from 1-9 ,0 starting at the left pinky.

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 the participant's body weight. IVs are required for administering contrast. IV's must be placed before arriving at the scanner.

Development time: Development time is used in concert with a VUIIS primary faculty member to develop, implement, test, or evaluate new protocols, patches, and functionalities that have a broad core impact. Development time may not be used to supplement studies and is not provided to develop tools for one's own project.

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.

Eye Tracker: Allows users to track eye movement and alertness of the 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 reservation billing.

Lab name: Usually the last name of the 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 to assist with getting started. This time is to be used to help get studies started and functions as expected before participant enrollment. Matching time uses include meeting with technologists to discuss and build protocols, performing test runs of the study, to test the operation of ancillary equipment, etc.

OCT: Optical coherence tomography

Opportunistic scanning: Opportunistic time refers to time available on the scanner when the scanner is not being used. Users are permitted to run phantom scans, test stimulus paradigms, retrieve data, test patches, perform offline reconstructions, and build protocols during business hours, when a scanner's resource calendar is not reserved, and the scanner is not in use. It is not available during off-hours and does not include technologist support; as such, it is only available to VUIIS faculty, staff, and trainees.

Patch: Software patches are created to allow certain parameter changes that 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 a stimulus. Participants will be required to use earplugs with these headphones to protect from excess scanner noise.

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

Project ID: Every project must be assigned a number. All project approvals and IDs are assigned once every two weeks. Please be aware that these may vary slightly, depending on how the study is being billed.

Pulse Ox (PPU): Pulse oximeter, also known as a peripheral pulse unit, is a device placed on a 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. All VUIIS screening forms are located using REDCap links.

Respiratory band (Bellows): A small pillow, strapped to the participant's stomach, to monitor and record the participant's 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 responsible for turning them on and OFF. As well as sanitizing headphones at the end of each use.

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

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

Appendix II: gStudy

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

[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 can be directed to Baxter Rogers.

Appendix III: Physician Authorization for Research PET

Participant Information	
Name:	
Date of birth (DOB):	

Medical record number (MRN):	
PET Study Information	
IRB Number:	
VUHS Project ID (e.g., GOREJ_123):	
Radiotracer:	
Notes (e.g. dose specifications):	
Scheduled date & time:	
Referring Physician	
Signature:	
Name (printed):	
Date:	

Note: This form is for PET studies performed at the **VUHS Human Imaging Core ONLY**

Investigational Drug Service
 Department of Pharmaceutical Services
 1211 Medical Center Drive, VUH RM B-131 Nashville, TN 37232-7610
 Phone: (615) 343-1641 Fax: (615) 322-6643

Appendix IV: AU Request Form

Request for Authorized User for Research PET

Primary Investigator Information:	
	We are requesting the services of a Radiologist or Nuclear Medicine Physician to serve as an authorized user for our PET research project.
Is this for a New Project or Renewal? (circle one)	
Brief Description of Imaging Protocol:	
Radiotracer(s) & Dose Amount(s):	
Notes (e.g., protocol changes):	
Primary Investigator (printed):	
Signature:	
Date:	
Authorized User Approval	
	I give my approval to serve as the Authorized User for the above research PET project.
Authorized User Signature:	
Name (printed):	
Date:	

Note: This form is for PET studies performed at the **VUIIS Human Imaging Core ONLY.**

Vanderbilt University Institute of Imaging Science | Human Imaging Core
 1161 21st Ave South, AAA-3111 MCN, Nashville, TN 37232-2310 PET/CT Console: (615) 875-3699

Created date: 4/4/2024

Appendix V: OCT Scan Log Form

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#?

Appendix VII: MRI Contrast eGFR Testing Requirements

VUIIS MRI Contrast eGFR Testing Guidelines

GFR Testing is required for participants who have any of the following:

- **Diabetes**
- **Hypertension**
- **Impaired Renal Function**
- **History of renal transplant or solitary kidney**
- **Renal Neoplasm or chemotherapy**
- **History of acute/chronic Renal failure**

Participants on renal dialysis are NOT eligible for MRI contrast.

Participants who fall within testing requirements must have results within 6 weeks of their study.

Values:

- **>60:** No contraindications. Clear for a contrasted scan.
- **45-60:** eGFR test must be repeated the day of the study and come back >45.
- **<30-44:** eGFR must be repeated the day of the study and come back >45 to be eligible for MRI contrast.