

CAMRIS SOP #301

Use of Gadolinium in Human Research Studies

Responsible Committee: Safety	Effective From: August 8, 2024	Last Approved: August 8, 2024	Next Review: June 1, 2025	Next Approval: July 1, 2024
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1. Purpose

This standard operating procedure (SOP) provides guidance on the safe use of gadolinium-based contrast agents (“gadolinium”) in human studies.

2. Scope

These procedures apply to the ordering and use of gadolinium for studies staffed by CAMRIS technologists within CAMRIS and clinical-shared facilities. In clinical facilities, these policies do not override any policies created by the relevant clinical services or hospital.

3. Instructions and Procedures

3.1. Allowed Gadolinium-Based Contrast Agents

Among gadolinium contrast agents, CAMRIS only authorizes Dotarem for human studies. Any exceptions to this rule must be specifically authorized by CAMRIS.

3.2. Ethical Consent for Gadolinium in Research Studies

All participants receiving gadolinium for research must provide informed consent within an IRB-approved protocol.

3.3. Ordering and Scheduling of CAMRIS-Staffed Scans Using Gadolinium

The use of gadolinium must follow the process and staffing requirements laid out in the *ACR–SPR Practice Parameter For The Use Of Intravascular Contrast Media* (“ACR-IVCM”, available at <https://www.acr.org/-/media/ACR/Files/Practice-Parameters/IVCM.pdf>), the key elements of which for CAMRIS operations are outlined below.

3.3.1. Ordering studies with gadolinium

Consistent with *ACR-IVCM* section II.B, a radiologist or other appropriately trained physician must enter an order for an imaging study with gadolinium contrast in PennChart.

3.3.2. Required staffing for the use of gadolinium at HUP

Consistent with *ACR-IVCM* section II.E, all studies using gadolinium must be performed under the supervision of a radiologist or other supervising provider. Studies scheduled before 3pm on regular hospital workdays (*i.e.*, not holidays or other days with reduced hospital staffing) are under the supervision of the hospital staff radiologist. Studies performed after 3pm or outside regular hospital workdays must arrange their own appropriate supervision;

consult *ACR-IVCM* section II.E for a complete list of the qualifications and responsibilities of the supervising provider. Groups who wish to perform studies with contrast after 3pm must develop a plan to provide appropriate supervision, and CAMRIS must approve the supervision plan before studies can start.

3.3.3. Scheduling scans at Stellar Chance

Currently CAMRIS does not allow the use of gadolinium at Stellar Chance.

3.4. Placement of Intravenous Lines

- 3.4.1. CAMRIS staff will make a best effort to place IV lines for the purposes of injecting contrast. CAMRIS does not perform ultrasound-guided IV placement. The number of attempts any CAMRIS staff member can make to place an IV line is limited to 2, and the total number of attempts across all staff is limited to 4, as per HUP Nursing Practice Manual 4B-02-02 section A.1.d (available at: https://uphsxnet.uphs.upenn.edu/hupnurpl/intraven_intraspinal_pdf/4B-02-02.pdf):

A. Peripheral Intravenous (PIV) Catheters

1. Insertion

- d. One clinician (RN, NP, PA, or MD) should make no more than two attempts at gaining IV access, and the total number of attempts should not exceed four.

- 3.4.2. If CAMRIS staff cannot successfully place an IV line, study teams can either proceed without contrast or have their scan slot cancelled without charge. Study teams can then evaluate non-CAMRIS options for IV line placement and reschedule when a plan is in place for successful IV line placement.
- 3.4.3. Studies that are determined to have a high rate of IV placement failures with CAMRIS staff (e.g., due to their study population), may be directed by CAMRIS to identify non-CAMRIS resources for the placement of IV lines. For studies identified as high-difficulty, participants will be required to arrive with an IV line already in place, or must accept the risk that CAMRIS staff may not be able to place a line and no free cancellation will be provided.

3.5. Use of Intravenous Lines for Other Purposes

IV lines placed by CAMRIS staff for the purposes of injecting contrast are not to be used for any other purpose. IV fluids mixed with blood may alter blood test results, even with a saline lock. Additionally, drawing blood may also compromise the IV line, requiring a restart. As noted in HUP Nursing Practice Manual 4B-02-02 section D (available at: https://uphsxnet.uphs.upenn.edu/hupnurpl/intraven_intraspinal_pdf/4B-02-02.pdf):

D. Labs

1. Blood draws should be primarily obtained from peripheral venipuncture, arterial lines in the critical care setting, or central lines by trained nurses (Refer to policy [Central Line Blood Draw](#)).
2. Blood draws may be obtained from a midline, when unable to obtain peripherally in patients without arterial lines, by a trained registered nurse.
3. If unable to obtain via venipuncture, consider contacting MD. Blood sampling from short peripheral catheters may be indicated in certain situations (serial testing, patients with bleeding disorders) but may result in higher rates of hemolysis and spurious lab values. Refer to Elsevier [Blood Specimen Collection: Short Peripheral Catheter Syringe and Vacuum Extraction Method](#)

4. Update History

Date:	Description of Revision
Nov 30, 2023	Initial version
Jan 11, 2024	Added section 3.4 Use of Intravenous Lines for Other Purposes. Updated section 3.3.2 to clarify that study teams must staff injections on hospital holidays and other low-staffing events.
Aug 8, 2024	Added section 3.4 Placement of Intravenous Lines and renumbered section previous section 3.4 to 3.5.