

# <sup>18</sup>F-Fluciclovine

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## CLINICAL INDICATIONS

<sup>18</sup>F-fluciclovine (Axumin; Blue Earth Diagnostics) is an amino acid analog indicated for PET in men with suspected recurrent prostate cancer based on an elevated level of prostate-specific antigen (PSA) after prior treatment (4).

## CONTRAINDICATIONS

None.

## PATIENT EDUCATION AND PREPARATION

### Before Arrival in PET/CT Department

- Allow the patient to take prescribed medications with small sips of water.
- Instruct the patient not to take any food or water by mouth for at least 4 h before receiving the <sup>18</sup>F-fluciclovine injection.
- Instruct the patient to avoid significant strenuous exercise for 24 h before receiving the <sup>18</sup>F-fluciclovine injection.
- Instruct the patient to avoid voiding the urinary bladder for at least 1 h before receiving the <sup>18</sup>F-fluciclovine injection and undergoing imaging.

### On Arrival in PET/CT Department

- Obtain a focused history of past and current diseases, interventional or surgical procedures, and medications.
- Obtain and document the patient's height and weight.
- Educate the patient in detail about the procedure, including time to completion, required position for imaging (supine), and voiding restrictions.
- Evaluate the patient's ability to lie still for up to 30 min.

## PROTOCOL AND ACQUISITION

- Unless contraindicated, place an intravenous catheter in the right arm (avoids possible uptake in the Virchow lymph node in the left supraclavicular fossa, should any portion of the dose be infiltrated), and verify patency with a normal-saline flush (1,3).
- Position the patient supine on the imaging table, with the arms above the head.
- Evaluate patient comfort, emphasizing to the patient the importance of remaining still.

- Perform a scout CT view.
- Plan the CT and PET region to be from skull base to mid thigh, with the prostate bed centered in the first bed position.
- Acquire a CT scan from upper mid thigh to skull base for anatomic correlation and attenuation correction, per site standards, before assaying the patient dose. Refer to the manufacturer's recommendations for the CT acquisition parameters.
- Move the patient into position for the PET scan, and prepare for the scan but do not start it (Table 1) (2).
- Prepare and calibrate the recommended dose (370 MBq [10 mCi] ± 20%), inject it intravenously (with the patient's arms down) over a period of 5–10 s, and follow it by a 10-mL saline flush.
- Begin imaging within 3–5 min after injection (with a goal of 4 min).

## PROCESSING

- Review raw data for motion.
- Use <sup>18</sup>F-FDG reconstruction parameters (iterative reconstruction is most often used, and the gaussian filter should not exceed 5 mm).

**TABLE 1**  
Standard PET Acquisition Parameters

Parameter	Specifications
Camera type	PET or PET/CT
Energy peak	511 keV
Injection-to-imaging time	3–5 min (4 min optimal)
Attenuation correction	PET: cesium or germanium source
	PET/CT: CT acquisition
Patient position	Supine
Arm position	Above head
Bed positions	Adequate to include upper thigh to skull base (ischial tuberosities to vertex)
Time per bed position*	5 min for pelvis region (2 bed positions)
	3–5 min for remaining bed positions
View	Mid thigh to skull base

\*Site- and scanner-dependent.

- Refer to the manufacturer's guidelines for emission-data reconstruction protocols that correct for detector efficiency (normalization), system dead time, random coincidences, scatter attenuation, and sampling non-uniformity.
- Create non-attenuation-corrected and attenuation-corrected images.
- Appropriately scale data and display in transaxial, coronal, and sagittal planes and as a rotating maximum-intensity-projection image.

## REFERENCES

1. Tade F, Sajdak RA, Gabriel M, Wagner RH, Sabir-Baruch B. Best Practices of <sup>18</sup>F-fluciclovine PET/CT imaging for recurrent prostate cancer: a guide for technologists. *J Nucl Med Technol*. June 10, 2019 [Epub ahead of print].
2. Farrell MB, Mantel ES, Basso DA, Thomas KS, Kerr BR. PET: whole body imaging—<sup>18</sup>F-FDG. In: *Quick Reference Protocol Manual for Nuclear Medicine Technologists*. Reston, VA: Society of Nuclear Medicine and Molecular Imaging; 2014:271–274.
3. Mantel ES, Williams J. F-18 fluciclovine: part of your imaging arsenal. *Uptake*. 2017;23(1):1, 7.
4. Axumin (<sup>18</sup>F-fluciclovine) [prescribing information]. Oxford, UK: Blue Earth Diagnostics Ltd.; 2016.