

Scan #1010

Total Dose: 200 to 1,200 mSv



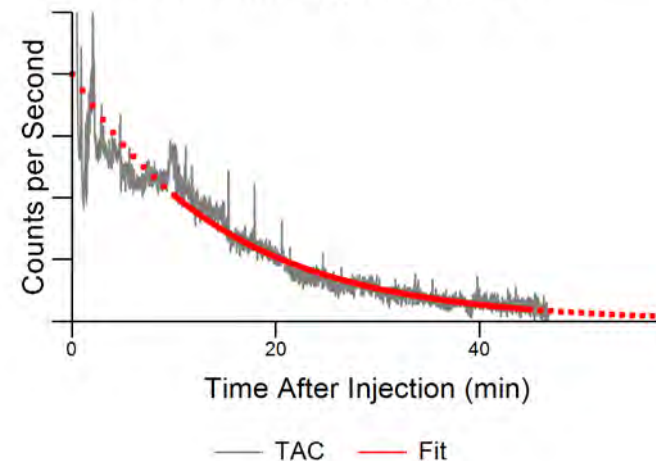
Isotope	F-18
Injection Method	Manual, IV
Injection Location	R Antecubital
Injected Activity	14.29 mCi
Radiotracer Volume	1.50 mL
Saline Flush Volume	10.0 mL
Imaging Time	56.9 min
% Extravasation	18 %
Initial Activity	2.63 mCi
Imaging Time Activity	0.04 mCi
Reabsorption Rate	10.3 min
Dose Calculation Volume	10.28 and 1.00 cm ³
Dose Rate	8.9 and 80.5 mSv/mCi-min
Total Dose	200 to 1,200 mSv

As part of an 18F-FDG study, this patient was injected in the right antecubital with 14.29 mCi comprising 1.5 mL. Additionally, the injection was flushed with 10 mL of saline.

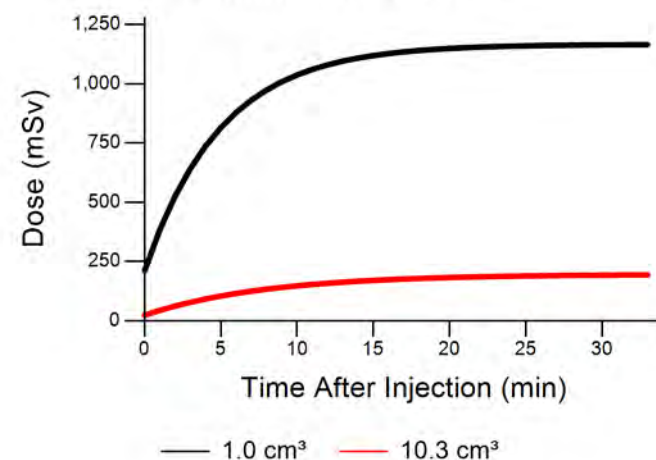
Based on PET image measurements and dynamic time-activity data, the initial infiltration was estimated to be 2.63 mCi or 18%.

Using an initial infiltrated tissue volume of 1 cm³, dose was calculated to be 1,200 mSv. Assuming complete infiltration of the saline flush would result in 200 mSv of dose to 10.28 cm³ of tissue.

TAC with Exponential Fit



Cumulative Dose



Scan #1070

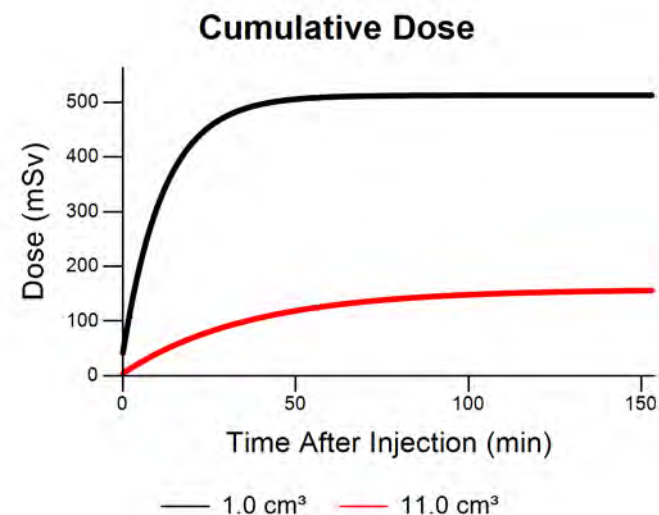
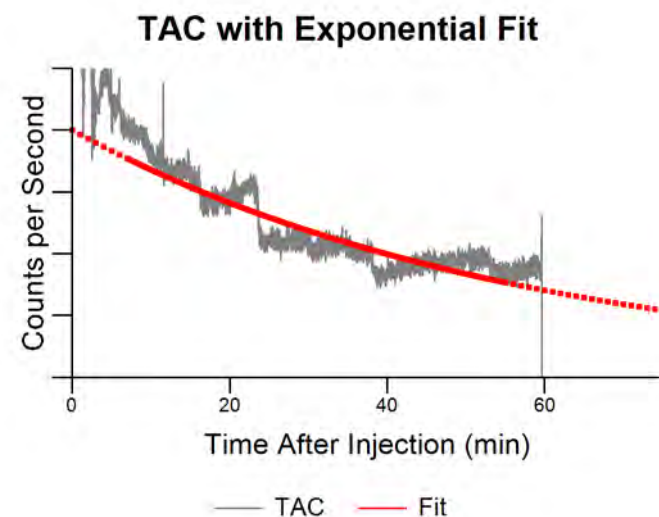
Total Dose: 200 to 500 mSv



Isotope	F-18
Injection Method	Manual, IV
Injection Location	R Antecubital
Injected Activity	16.87 mCi
Radiotracer Volume	1.50 mL
Saline Flush Volume	10.0 mL
Imaging Time	67.0 min
% Extravasation	3 %
Initial Activity	0.49 mCi
Imaging Time Activity	0.10 mCi
Reabsorption Rate	39.8 min
Dose Calculation Volume	11.00 and 1.00 cm ³
Dose Rate	8.7 and 84.4 mSv/mCi-min
Total Dose	200 to 500 mSv

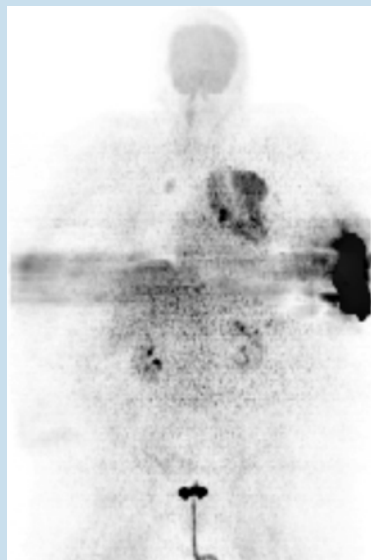
This patient underwent PET/CT imaging using 18F-FDG. The injection was performed in the right antecubital through an IV with 10 ml of saline flush. We estimate that 0.49 mCi, or 3%, of the injected activity was extravasated into the arm tissue. At imaging time, only 0.1 mCi remained at the injection site.

The estimated dose to the arm tissue is between 200 and 500 mSv.



Scan #2078

Total Dose: 1,500 to 4,900 mSv

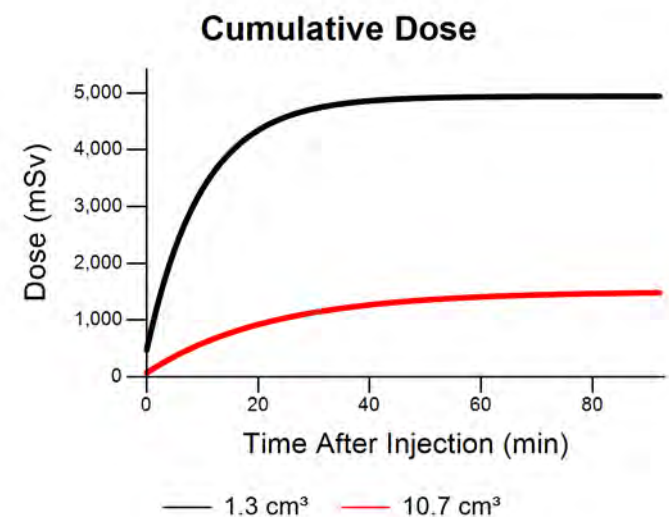
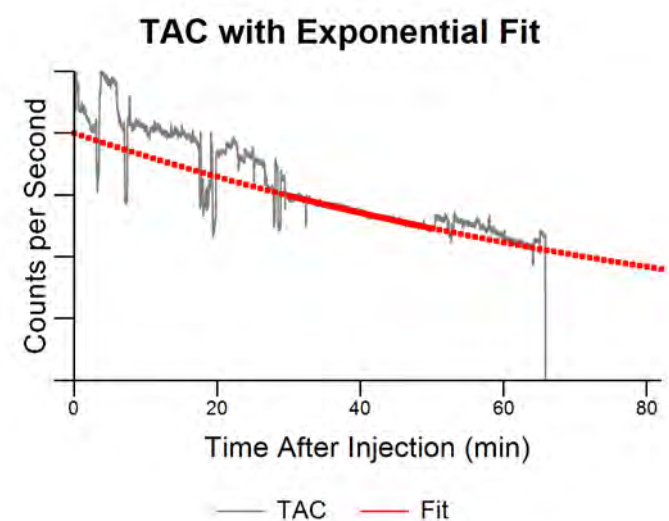


Isotope	F-18
Injection Method	Manual, IV
Injection Location	L Antecubital
Injected Activity	17.33 mCi
Radiotracer Volume	1.50 mL
Saline Flush Volume	10.0 mL
Imaging Time	76.6 min
% Extravasation	45 %
Initial Activity	7.75 mCi
Imaging Time Activity	2.27 mCi
Reabsorption Rate	71.4 min
Dose Calculation Volume	10.67 and 1.34 cm ³
Dose Rate	8.6 and 61.0 mSv/mCi-min
Total Dose	1,500 to 4,900 mSv

The patient was injected in the left antecubital with 17.33 mCi of 18F-FDG in 1.5 mL. Subsequent flush consisted of 10 mL of saline.

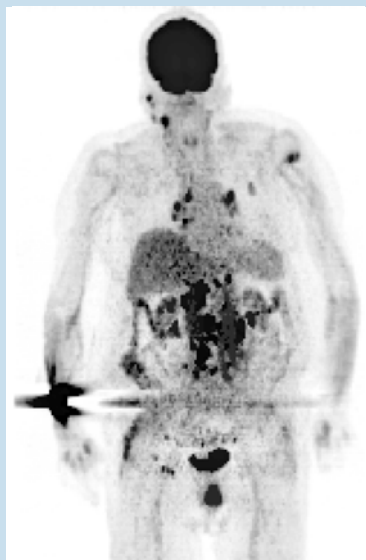
At imaging time, PET measurements indicate 2.27 mCi of activity remained at the injection site, and significant image artifacts were noted.

Based on PET image measurements and time-activity curve data, the initial infiltration was estimated to be 7.75 mCi or 45%. Dose was calculated for infiltrated tissue volumes of 1.3 cm³ and 10.7 cm³, and resulted in dose between 1,500 and 4,900 mSv.



Scan #2169

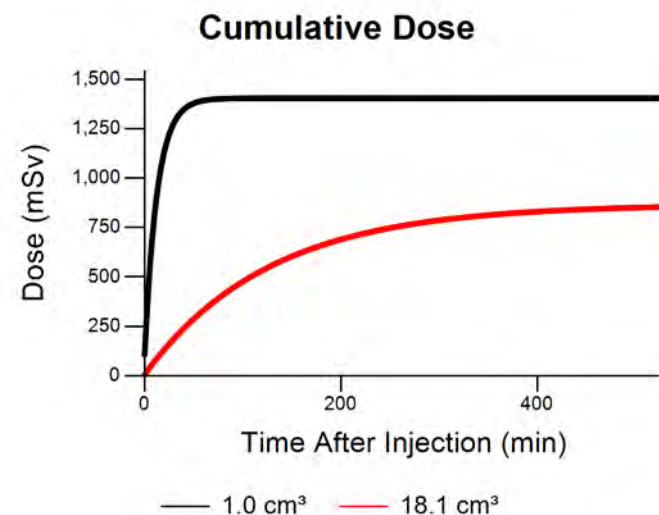
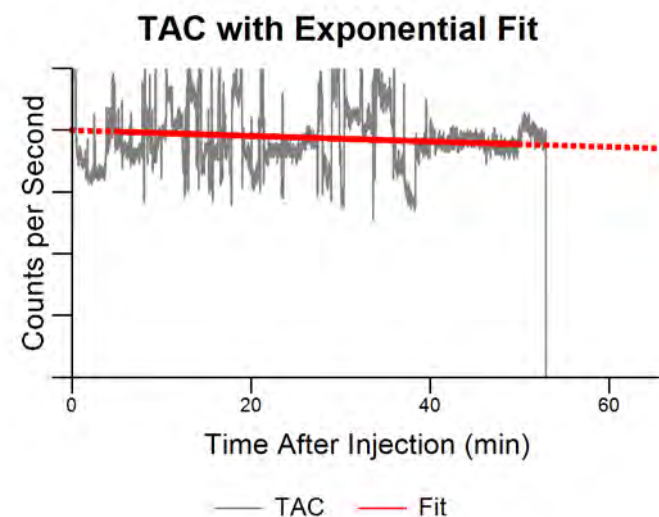
Total Dose: 900 to 1,400 mSv



Isotope	F-18
Injection Method	Manual, IV
Injection Location	R Forearm
Injected Activity	16.11 mCi
Radiotracer Volume	1.50 mL
Saline Flush Volume	18.0 mL
Imaging Time	64.9 min
% Extravasation	8 %
Initial Activity	1.32 mCi
Imaging Time Activity	0.81 mCi
Reabsorption Rate	594.3 min
Dose Calculation Volume	18.12 and 1.00 cm ³
Dose Rate	5.2 and 80.5 mSv/mCi-min
Total Dose	900 to 1,400 mSv

Administration of ¹⁸F-FDG consisted of 16.11 mCi injected through an IV in the right forearm followed by 18 mL of saline. Using PET images and TAC data, the extravasation was estimated to be approximately 8% of injected activity.

Total dose was calculated to be 1,400 mSv for a tissue volume of 1 cm³ and 900 mSv for a tissue volume of 18.1 cm³.



Scan #2189

Total Dose: 2,400 to 5,200 mSv



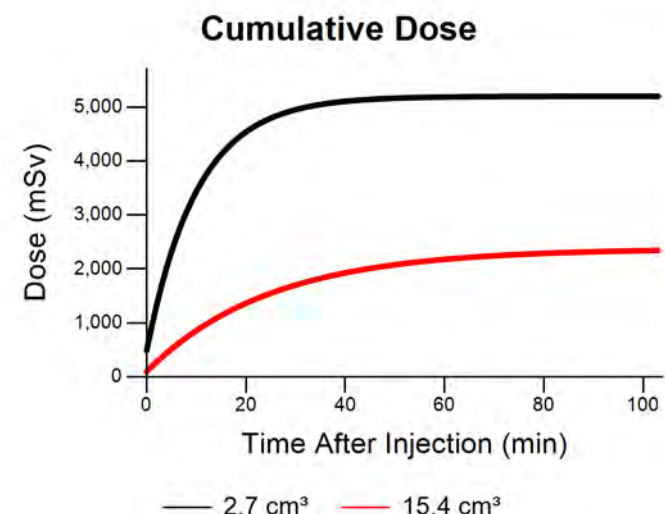
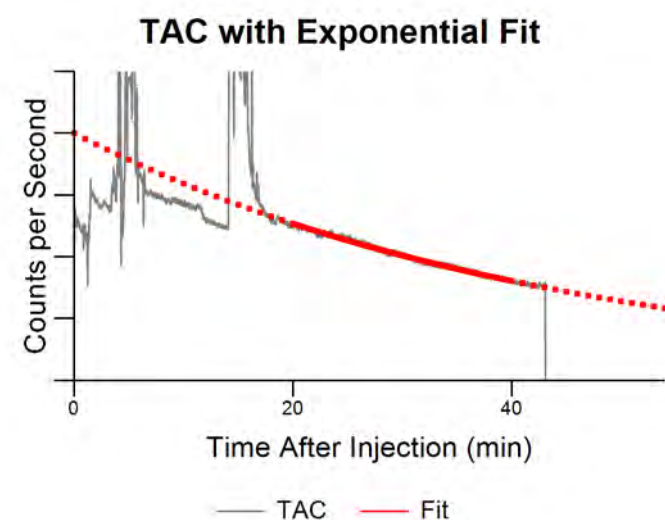
Isotope	F-18
Injection Method	Manual, IV
Injection Location	R Antecubital
Injected Activity	17.20 mCi
Radiotracer Volume	1.50 mL
Saline Flush Volume	14.0 mL
Imaging Time	61.8 min
% Extravasation	91 %
Initial Activity	15.59 mCi
Imaging Time Activity	2.59 mCi
Reabsorption Rate	30.5 min
Dose Calculation Volume	15.36 and 2.72 cm ³
Dose Rate	6.1 and 31.2 mSv/mCi-min
Total Dose	2,400 to 5,200 mSv

For a lung cancer imaging study, the patient was injected in the right antecubital with 17.2 mCi of FDG comprising 1.5 mL. The injection was followed by a saline flush of 14 mL. After an uptake time period of 62 minutes, PET imaging indicated 2.59 mCi remained at the injection site.

The time-activity curve indicates a reabsorption half-time of 30.5 minutes, resulting in an estimated initial infiltration of 15.6 mCi or 91%. Using the injected volumes, we calculated dose for tissue volumes of 2.70 cm³ and 15.4 cm³.

Dose rates for this case ranged from 31.2 mSv/mCi-min to 6.1 mSv/mCi-min and resulted in estimated doses to tissue of 2,400 to 5,200 mSv.

The clinical aspects of this case have been published. doi:10.3389/fmed.2018.00143



Scan #4679

Total Dose: 400 to 2,100 mSv



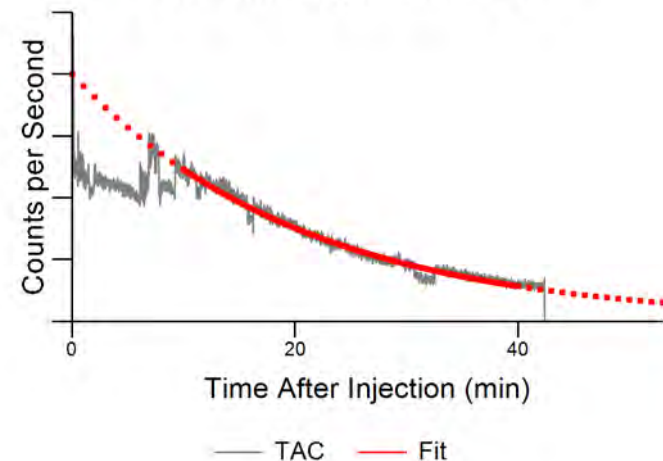
Isotope	F-18
Injection Method	Manual, IV
Injection Location	R Antecubital
Injected Activity	10.44 mCi
Radiotracer Volume	1.50 mL
Saline Flush Volume	10.0 mL
Imaging Time	54.0 min
% Extravasation	28 %
Initial Activity	2.87 mCi
Imaging Time Activity	0.15 mCi
Reabsorption Rate	14.2 min
Dose Calculation Volume	11.00 and 1.00 cm ³
Dose Rate	8.7 and 84.4 mSv/mCi-min
Total Dose	400 to 2,100 mSv

For an FDG-PET scan, the patient was injected in the right antecubital fossa with 10.44 mCi of 18F-FDG in 1.5 mL. The injection was followed by a 10 mL flush of saline.

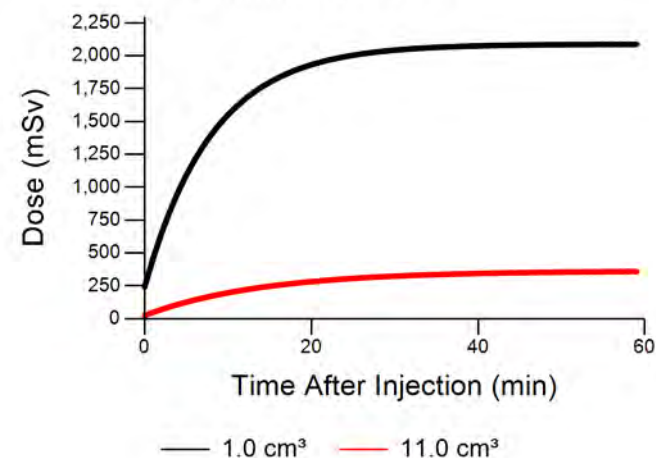
Based on the time-activity curve data and activity quantification at imaging time, we estimated that 2.87 mCi (27.5%) of the injected radiopharmaceutical was extravasated which resolved over 54 minutes to 0.15 mCi.

For tissue volumes of 1 and 11 cm³, tissue dose was calculated to be between 400 and 2,100 mSv.

TAC with Exponential Fit



Cumulative Dose



Scan #8634

Total Dose: 100 to 1,000 mSv

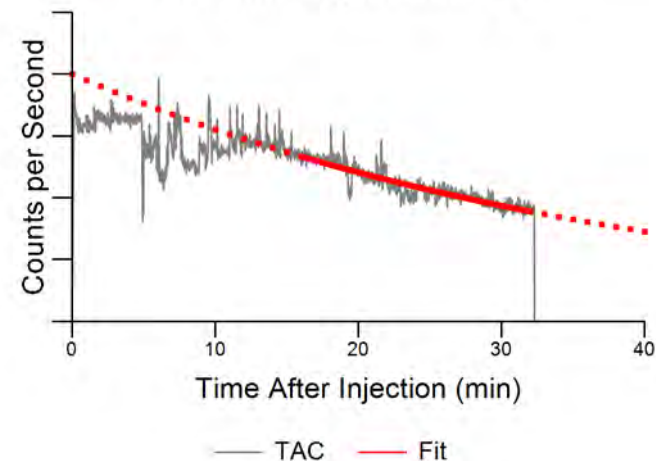


Isotope	F-18
Injection Method	Autoinjector, IV
Injection Location	R Antecubital
Injected Activity	9.98 mCi
Radiotracer Volume	1.50 mL
Saline Flush Volume	60.0 mL
Imaging Time	56.5 min
% Extravasation	14 %
Initial Activity	1.42 mCi
Imaging Time Activity	0.24 mCi
Reabsorption Rate	27.4 min
Dose Calculation Volume	60.21 and 1.00 cm ³
Dose Rate	1.7 and 80.5 mSv/mCi-min
Total Dose	100 to 1,000 mSv

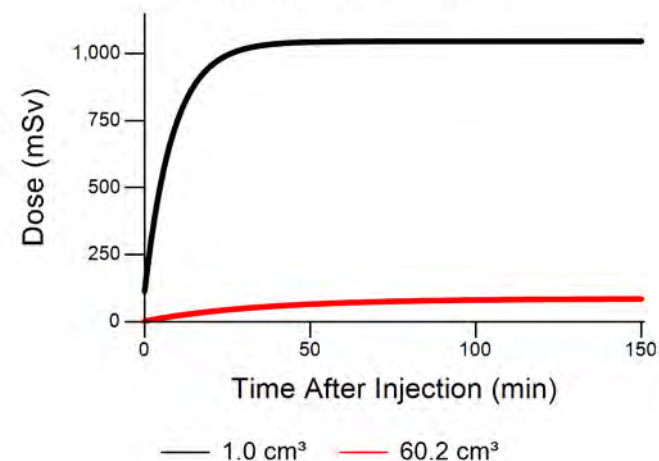
Administration of ¹⁸F-FDG consisted of 9.98 mCi injected with an auto-injector through an IV in the right antecubital followed by 60 mL of saline. Using PET images and TAC data, the extravasation was estimated to be approximately 14% of injected activity.

Total dose was calculated to be 1,000 mSv for a tissue volume of 1 cm³ and 100 mSv for a tissue volume of 60.2 cm³.

TAC with Exponential Fit



Cumulative Dose



Scan #9535

Total Dose: 100 to 1,200 mSv

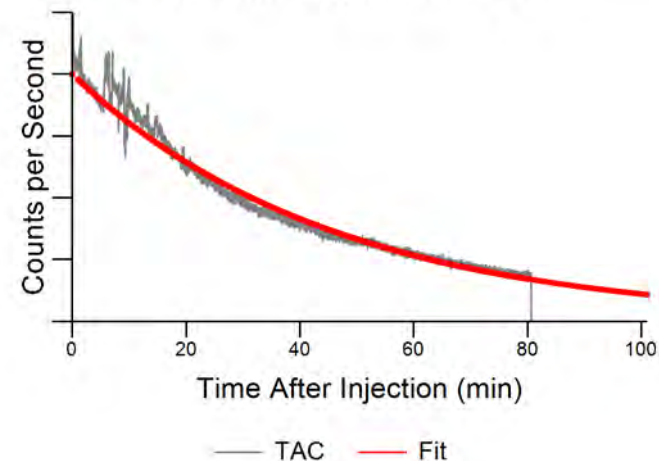


Isotope	F-18
Injection Method	Manual, IV
Injection Location	R Antecubital
Injected Activity	11.96 mCi
Radiotracer Volume	1.50 mL
Saline Flush Volume	20.0 mL
Imaging Time	107.2 min
% Extravasation	7 %
Initial Activity	0.89 mCi
Imaging Time Activity	0.04 mCi
Reabsorption Rate	31.5 min
Dose Calculation Volume	21.00 and 1.00 cm ³
Dose Rate	4.7 and 84.4 mSv/mCi-min
Total Dose	100 to 1,200 mSv

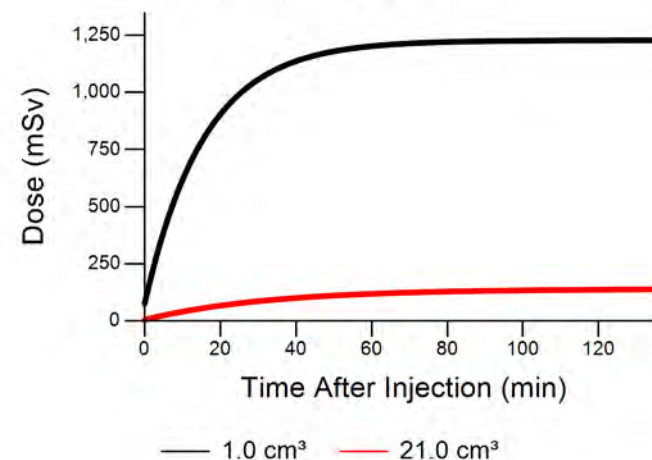
For a PET scan, the patient was injected with 11.96 mCi of 18F-FDG in 1.5 mL which was followed by 20 mL of saline. We estimate that 7.5% of the injection was extravasated into the right antecubital tissue.

For tissue volumes between 1 and 21 cm³, dose calculations resulted in 100 to 1,200 mSv.

TAC with Exponential Fit



Cumulative Dose



Scan #9571

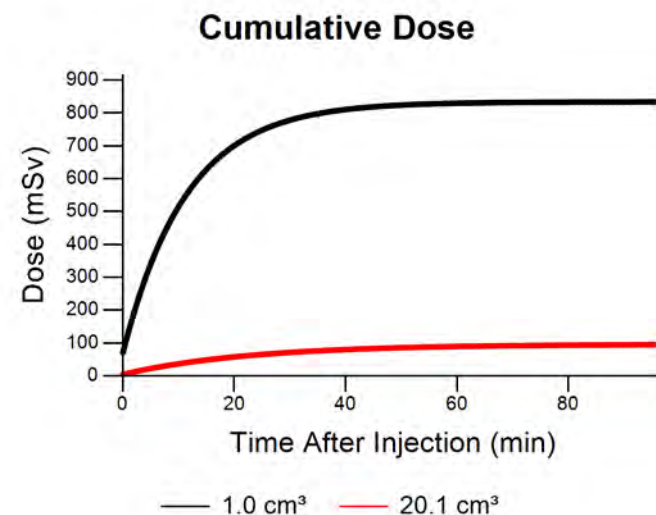
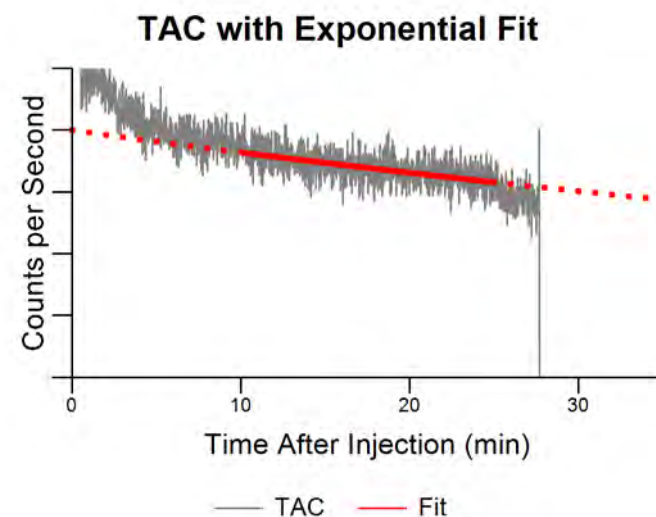
Total Dose: 100 to 800 mSv



Isotope	F-18
Injection Method	Manual, IV
Injection Location	R Forearm
Injected Activity	9.90 mCi
Radiotracer Volume	1.50 mL
Saline Flush Volume	20.0 mL
Imaging Time	74.0 min
% Extravasation	9 %
Initial Activity	0.87 mCi
Imaging Time Activity	0.27 mCi
Reabsorption Rate	73.4 min
Dose Calculation Volume	20.13 and 1.00 cm ³
Dose Rate	4.7 and 80.5 mSv/mCi-min
Total Dose	100 to 800 mSv

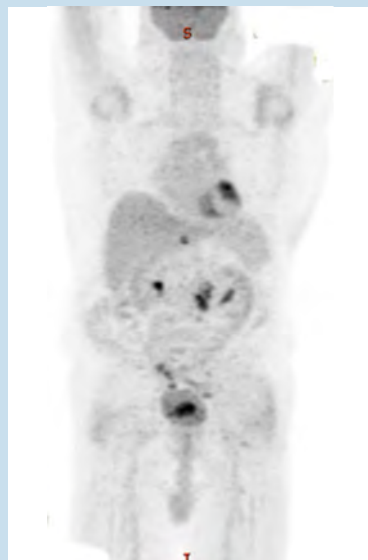
Administration of ¹⁸F-FDG consisted of 9.9 mCi injected through an IV in the right forearm followed by 20 mL of saline. Using PET images and TAC data, the extravasation was estimated to be approximately 9% of the injected activity.

Total dose was calculated to be 800 mSv for a tissue volume of 1 cm³ and 100 mSv for a tissue volume of 20.1 cm³.

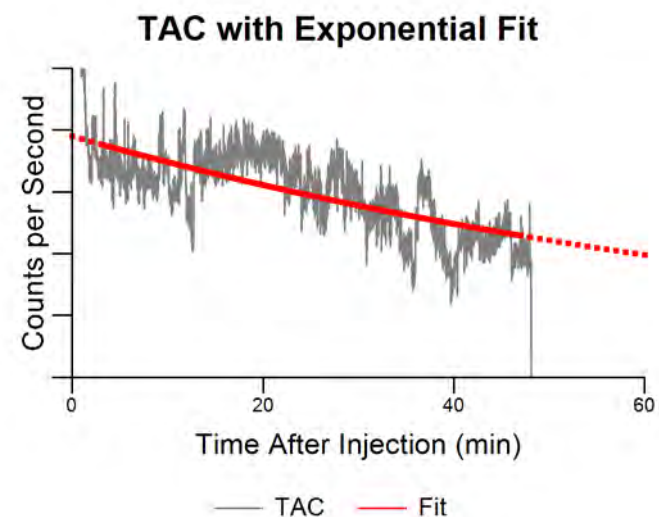


Scan #11490

Total Dose: 5,800 to 21,400 mSv



Isotope	F-18
Injection Method	Manual, IV
Injection Location	L Hand
Injected Activity	13.72 mCi
Radiotracer Volume	1.50 mL
Saline Flush Volume	10.0 mL
Imaging Time	57.0 min
% Extravasation	92 %
Initial Activity	12.62 mCi
Imaging Time Activity	4.63 mCi
Reabsorption Rate	61.4 min
Dose Calculation Volume	11.38 and 2.76 cm ³
Dose Rate	8.0 and 30.8 mSv/mCi-min
Total Dose	5,800 to 21,400 mSv

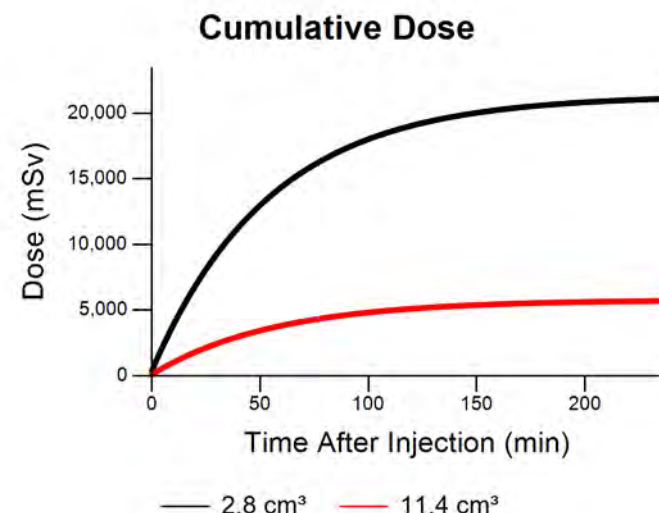


The patient was injected in the left hand with 13.7 mCi of FDG. The injection site was out of the PET imaging field of view. Had Lucerno's Lara System not identified the presence of excess radiotracer near the injection site, no one would have known that the patient had been infiltrated.

This patient had a repeat scan five days later, and four lesions were studied. The new data showed that the infiltration caused the original SUVs to be understated by 33-54%, and MTV calculations were understated by 32-70%. Using the infiltrated image would likely have impacted patient care.

Using the change in quantifiable measures as an indicator of infiltration severity, we estimated that approximately 92% of the injected activity was infiltrated. We calculated dose based on initial tissue volumes ranging from 2.8 to 11.4 cm³.

In addition to the negative effect that this infiltration had on the patient's diagnostic study, the patient also received between 5,800 and 21,400 mSv of dose to their hand tissue.

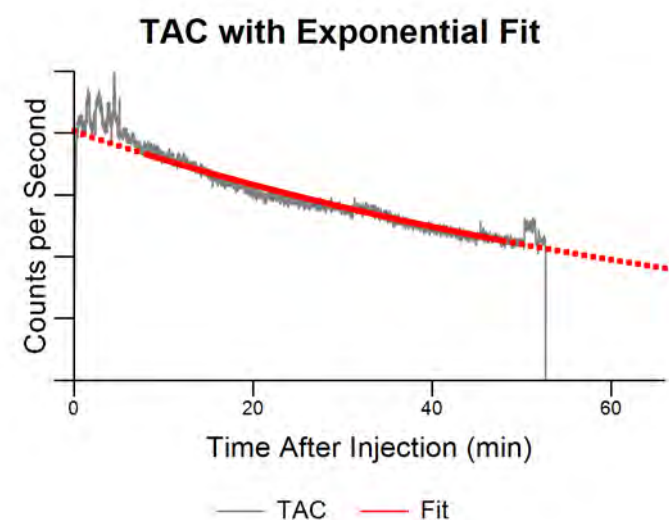


Scan #14547

Total Dose: 1,700 to 6,000 mSv



Isotope	F-18
Injection Method	Manual
Injection Location	L Forearm
Injected Activity	10.22 mCi
Radiotracer Volume	1.50 mL
Saline Flush Volume	30.0 mL
Imaging Time	62.0 min
% Extravasation	100 %
Initial Activity	10.22 mCi
Imaging Time Activity	5.19 mCi
Reabsorption Rate	57.4 min
Dose Calculation Volume	31.50 and 3.00 cm ³
Dose Rate	3.1 and 28.4 mSv/mCi-min
Total Dose	1,700 to 6,000 mSv

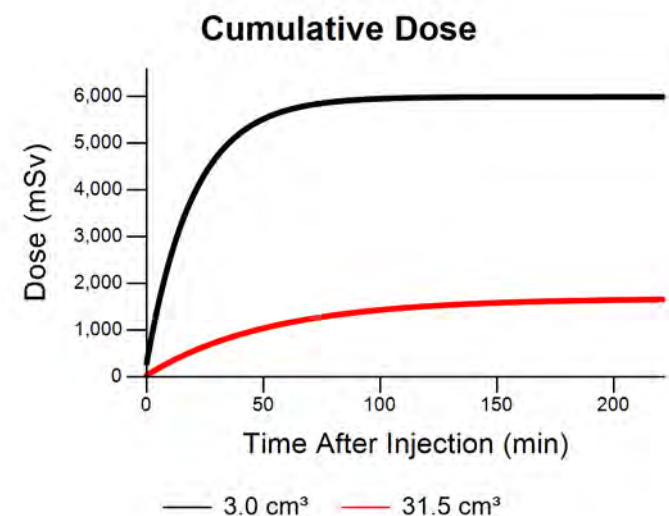


The patient was injected in the left forearm with 10.2 mCi of FDG. Lucerno's Lara System identified the presence of excess radiotracer near the injection site.

The patient had a repeat scan the next day. Axial images of a pancreatic tumor revealed the infiltration caused the original SUVs to be understated by 65%.

Using PET-measured infiltration activity at imaging time and the time-activity curve data, we estimate that 100% of the injected activity was infiltrated. We calculated dose based on initial tissue volumes ranging from 3.0 to 31.5 cm³.

In addition to the negative effect that this infiltration had on the patient's diagnostic study, the patient also received between 1,700 and 6,000 mSv of dose to their forearm tissue.



Scan #15170

Total Dose: 700 to 2,600 mSv



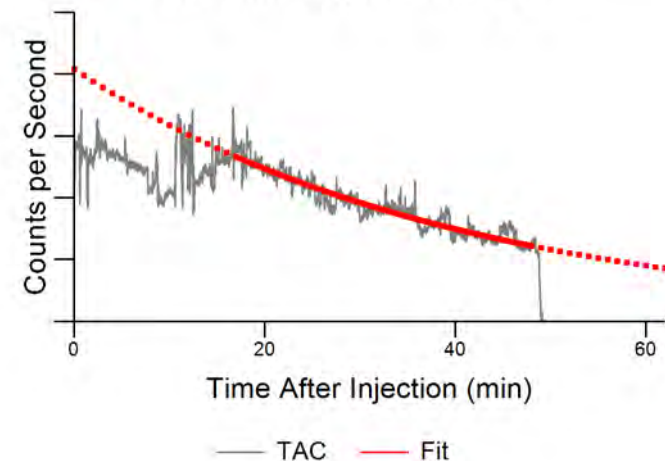
Isotope	F-18
Injection Method	Autoinjector, IV
Injection Location	L Antecubital
Injected Activity	9.99 mCi
Radiotracer Volume	4.00 mL
Saline Flush Volume	41.0 mL
Imaging Time	62.0 min
% Extravasation	77 %
Initial Activity	7.69 mCi
Imaging Time Activity	1.62 mCi
Reabsorption Rate	27.6 min
Dose Calculation Volume	44.08 and 6.16 cm ³
Dose Rate	2.2 and 14.4 mSv/mCi-min
Total Dose	700 to 2,600 mSv

As part of a breast tumor assessment study, the patient was injected in the left antecubital with 10.0 mCi of FDG using an auto-injector. Lucerno's Lara System identified the presence of excess radiotracer near the injection site even though the auto-injector reported an error-free injection.

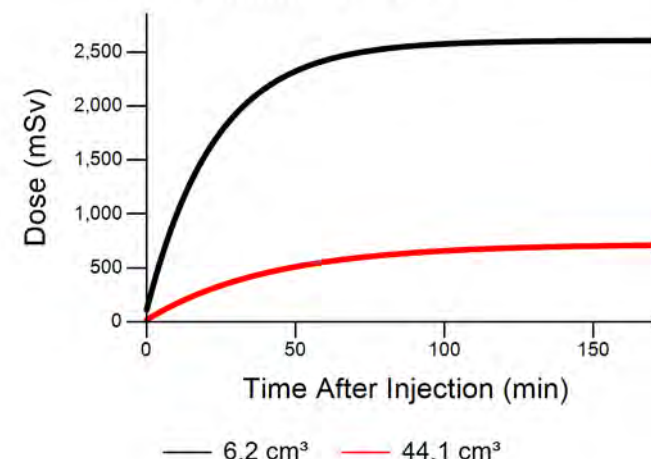
This patient had a repeat scan three days later. The repeat PET scan revealed the infiltration caused the SUVs of a breast tumor to be understated by 73%. An assessment based on the infiltrated scan would have erroneously concluded that the disease was responding favorably to the treatment regimen. A revised assessment based on the repeat study showed the disease was recalcitrant.

Using PET-measured infiltration activity at imaging time and the time-activity curve data, we estimated that 77% of the injected activity was infiltrated. We calculated dose based on tissue volumes ranging from 6.2 to 44.1 cm³. In addition to the negative effect that this infiltration had on the patient's assessment study, the patient also received between 700 and 2,600 mSv of dose to their arm tissue.

TAC with Exponential Fit



Cumulative Dose

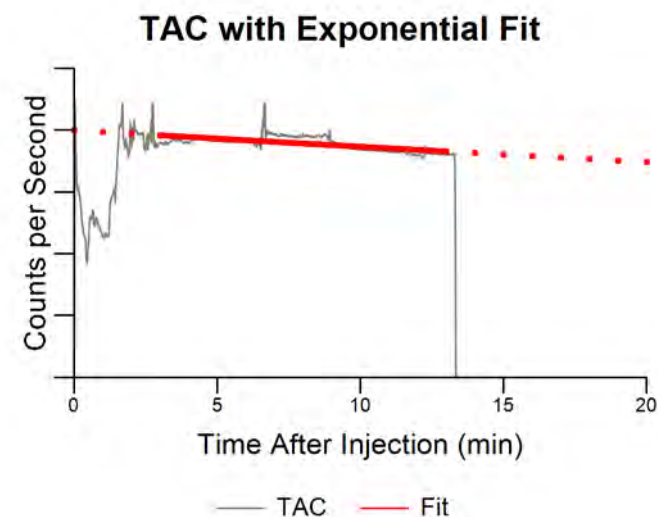


Scan #15771

Total Dose: 200 to 1,600 mSv



Isotope	Tc-99m
Injection Method	Manual, IV
Injection Location	R Antecubital
Injected Activity	25.38 mCi
Radiotracer Volume	1.00 mL
Saline Flush Volume	10.0 mL
Imaging Time	214.0 min
% Extravasation	10 %
Initial Activity	2.54 mCi
Imaging Time Activity	0.38 mCi
Reabsorption Rate	100.5 min
Dose Calculation Volume	10.10 and 1.00 cm ³
Dose Rate	0.7 and 6.0 mSv/mCi-min
Total Dose	200 to 1,600 mSv

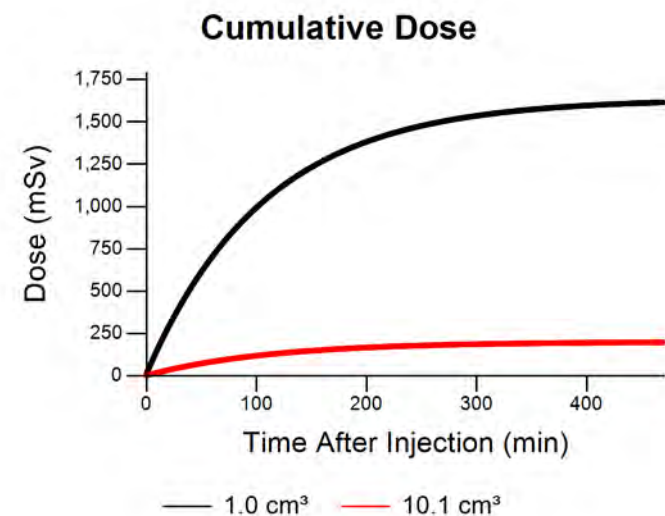


For a therapy assessment scan, the patient was injected in the right antecubital with 25.4 mCi of Tc-99m. Lucerno's Lara System identified the presence of excess radiotracer near the injection site.

No activity quantification could be made from the SPECT images, but infiltrated tissue volume was measured. Time-activity curve data was used to estimate the rate of reabsorption.

Tissue dose was calculated for an initial infiltration of 10% with corresponding initial tissue volume of 1.0 to 10.1 cm³.

The patient's arm tissue was exposed to unintended dose between 200 and 1,600 mSv.

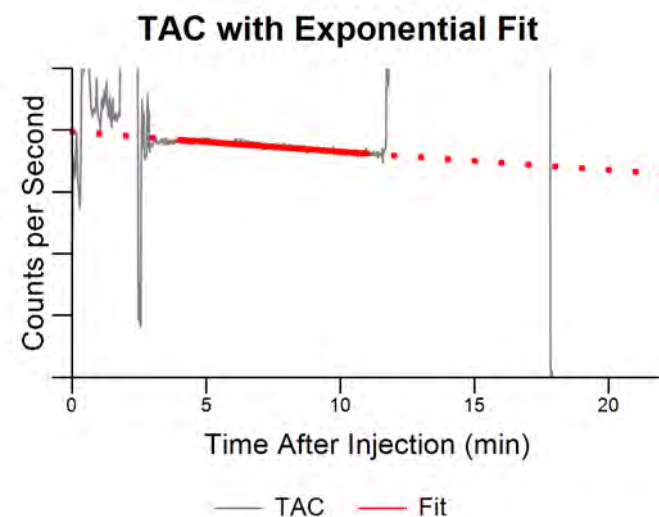


Scan #15819

Total Dose: 1,500 mSv



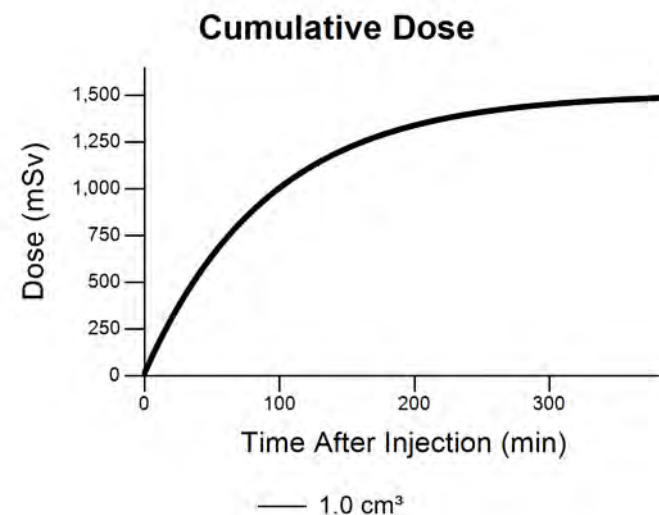
Isotope	Tc-99m
Injection Method	Manual
Injection Location	R Antecubital
Injected Activity	27.40 mCi
Radiotracer Volume	1.50 mL
Saline Flush Volume	0.0 mL
Imaging Time	247.0 min
% Extravasation	10 %
Initial Activity	2.74 mCi
Imaging Time Activity	0.21 mCi
Reabsorption Rate	81.7 min
Dose Calculation Volume	1.00 cm ³
Dose Rate	6.0 mSv/mCi-min
Total Dose	1,500 mSv



For a bone scan, the patient was injected in the right antecubital with 27.4 mCi of Tc-99m. Lucerno's Lara System identified the presence of excess radiotracer near the injection site. No activity quantification could be made from the SPECT images, but infiltrated tissue volume was measured. Time-activity curve data was used to estimate the rate of reabsorption.

This injection was a "straight stick" procedure with no saline flush after the radiotracer injection. When no flush is performed, initial infiltration volumes are very small. We have used 1 cm³ as the initial infiltrated tissue volume to avoid excessively high estimates of dose for a very small volume.

Tissue dose was calculated for an initial infiltration of 10%. The patient's arm tissue was exposed to unintended dose of 1,500 mSv.



Scan #16031R

Total Dose: 1,000 mSv



Isotope	F-18
Injection Method	Manual, IV
Injection Location	R Antecubital
Injected Activity	4.82 mCi
Radiotracer Volume	0.90 mL
Saline Flush Volume	0.0 mL
Imaging Time	56.0 min
% Extravasation	7 %
Initial Activity	0.36 mCi
Imaging Time Activity	0.20 mCi
Reabsorption Rate	63.5 min
Dose Calculation Volume	1.00 cm ³
Dose Rate	80.5 mSv/mCi-min
Total Dose	1,000 mSv

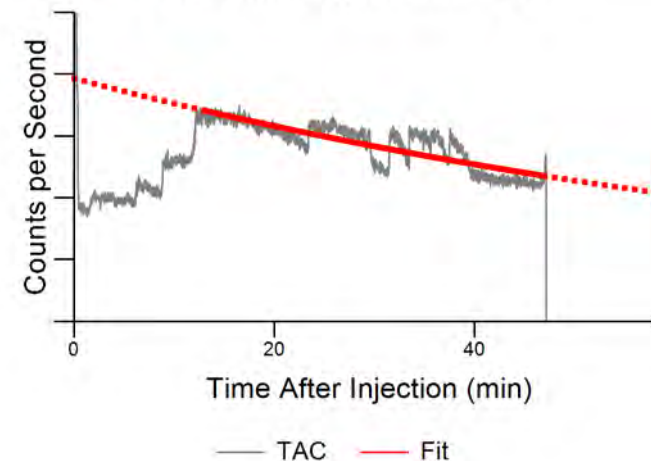
In the course of their PET scan, this patient was injected twice and both injections were infiltrated. The technologist performing the injection reported that they tried to inject in the right antecubital and realized an infiltration was occurring. He withdrew the catheter and started another IV in the left antecubital to finish the procedure.

For our analysis, we assume half of the radiotracer was injected into each arm.

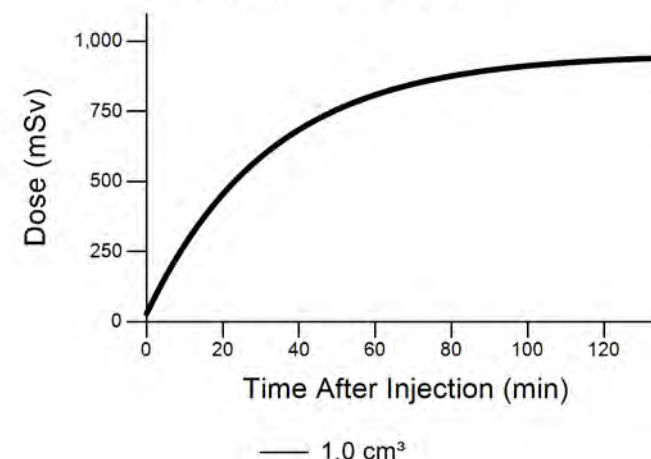
In the first attempt, 4.8 mCi of FDG was injected into the patient's right antecubital and was not flushed. Using PET-measured infiltration activity at imaging time and the time-activity curve data, we estimated that 7% of the 4.8 mCi was infiltrated. We used 1 cm³ for the initial infiltrated tissue volume.

From this first injection, 1 cm³ of the patient's arm tissue received unintended dose of 1,000 mSv.

TAC with Exponential Fit



Cumulative Dose

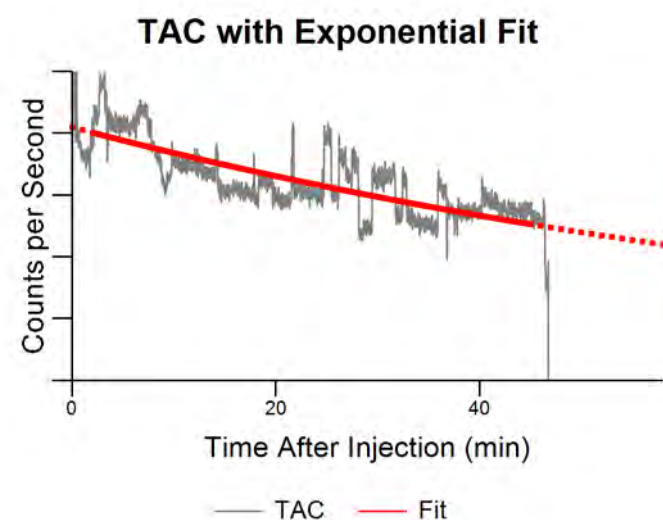


Scan #16074

Total Dose: 1,300 mSv



Isotope	F-18
Injection Method	Manual, Butterfly
Injection Location	L Antecubital
Injected Activity	17.65 mCi
Radiotracer Volume	2.62 mL
Saline Flush Volume	0.0 mL
Imaging Time	67.0 min
% Extravasation	4 %
Initial Activity	0.69 mCi
Imaging Time Activity	0.34 mCi
Reabsorption Rate	64.7 min
Dose Calculation Volume	1.00 cm ³
Dose Rate	80.5 mSv/mCi-min
Total Dose	1,300 mSv



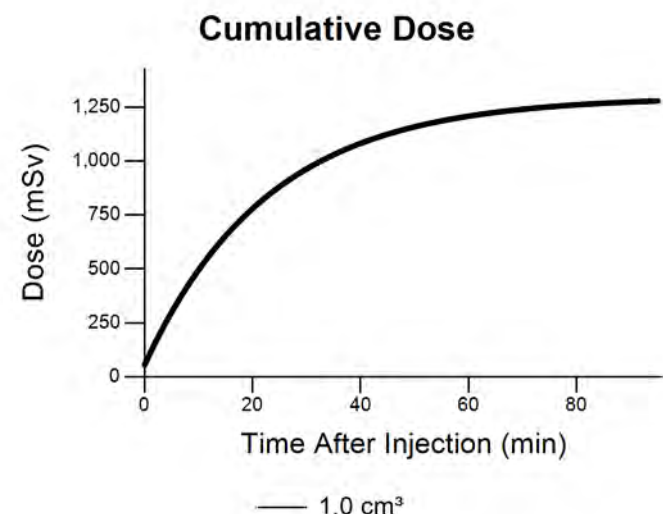
The patient was injected in the left antecubital with 17.7 mCi of FDG. The technologist performing the injection reported that the patient complained of pain near the IV after the radiotracer injection. As such, the technologist did not flush with saline.

No repeat of the imaging study was ordered in response to this infiltrated injection.

Using PET-measured activity at imaging time and the time-activity curve data, we estimate that 4% of the injected activity was infiltrated.

Because there was no saline flush, the infiltrated volume would be quite small, resulting in high calculated dose. Thus, we used 1 cm³ as a minimum initial infiltrated volume.

We estimate that 1 cm³ of the patient's arm tissue received an unintended dose exposure of 1,300 mSv.

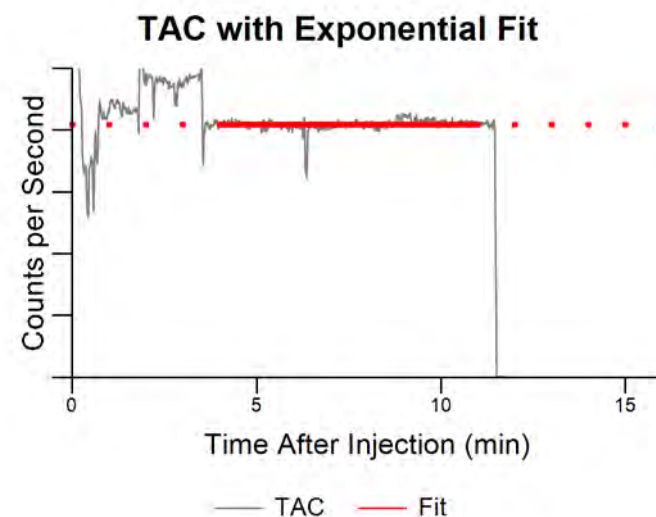


Scan #16380

Total Dose: 31,300 mSv



Isotope	Tc-99m
Injection Method	Manual, Straight Stick
Injection Location	R Antecubital
Injected Activity	26.20 mCi
Radiotracer Volume	0.50 mL
Saline Flush Volume	0.0 mL
Imaging Time	201.0 min
% Extravasation	50 %
Initial Activity	13.10 mCi
Imaging Time Activity	8.90 mCi
Reabsorption Rate	∞ min
Dose Calculation Volume	1.00 cm ³
Dose Rate	6.0 mSv/mCi-min
Total Dose	31,300 mSv

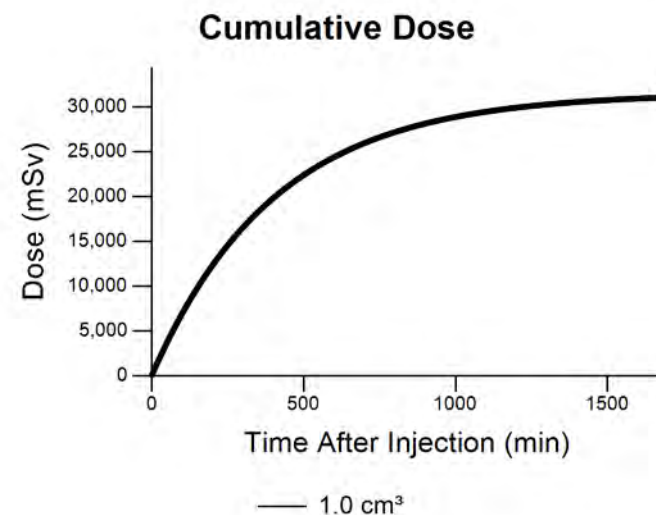


For a bone scan, the patient was injected in the right antecubital with 26.2 mCi of Tc-99m. Lucerno's Lara System identified the presence of excess radiotracer near the injection site.

The resulting SPECT images were found to be of "no diagnostic value" by the nuclear medicine physician. A repeat imaging study was performed 2 days later.

No activity quantification could be made from the SPECT images and the infiltrated tissue was partially outside of the imaging view. The visible portion of the infiltration at imaging time was measured to be 9.17 cm³, but we conservatively estimated its true volume to be 30 cm³. Time-activity curve data indicated that reabsorption was essentially nonexistent.

This injection was a "straight stick" procedure with no saline flush after the radiotracer injection. When no flush is performed, initial infiltration volumes are very small. We used 1 cm³ as the minimum initial volume. Calculated total tissue dose was 31,300 mSv.



Scan #16448

Total Dose: 100 to 1,100 mSv



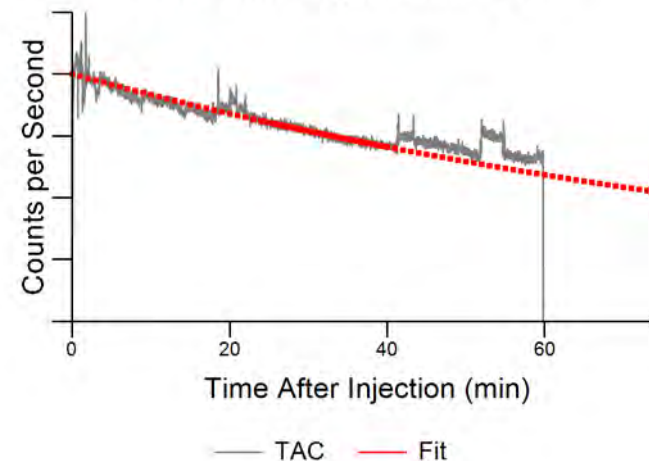
Isotope	F-18
Injection Method	Autoinjector, IV
Injection Location	L Antecubital
Injected Activity	10.01 mCi
Radiotracer Volume	1.50 mL
Saline Flush Volume	40.0 mL
Imaging Time	62.0 min
% Extravasation	9 %
Initial Activity	0.93 mCi
Imaging Time Activity	0.54 mCi
Reabsorption Rate	79.4 min
Dose Calculation Volume	40.14 and 1.00 cm ³
Dose Rate	2.4 and 80.5 mSv/mCi-min
Total Dose	100 to 1,100 mSv

Using an auto-injector, the patient was injected in the left antecubital with 10.01 mCi of FDG. The auto-injector performed a saline flush of 40 mL. Neither the technologist nor the auto-injector reported anything abnormal about the injection. No repeat of the imaging study was ordered in response to this infiltrated injection.

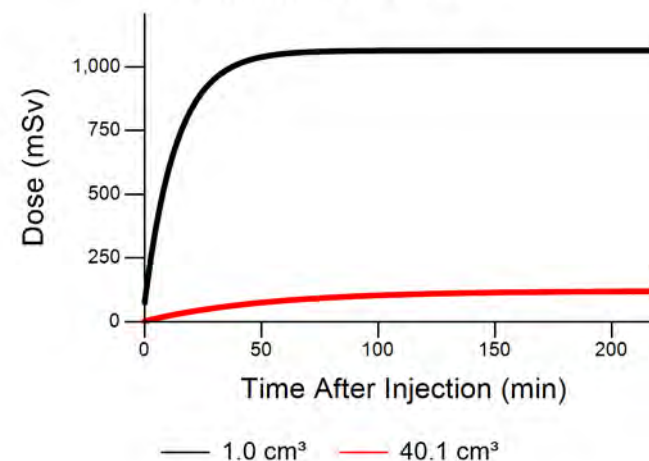
Using PET-measured activity at imaging time and the time-activity curve data, we estimate that 9% of the injected activity was infiltrated.

Not knowing how much of the saline flush may have been infiltrated as well, we used 1 cm³ as a minimum initial infiltrated volume and 40.1 cm³ as a maximum. We estimate that the dose to this patient's arm tissue was between 100 and 1,100 mSv.

TAC with Exponential Fit

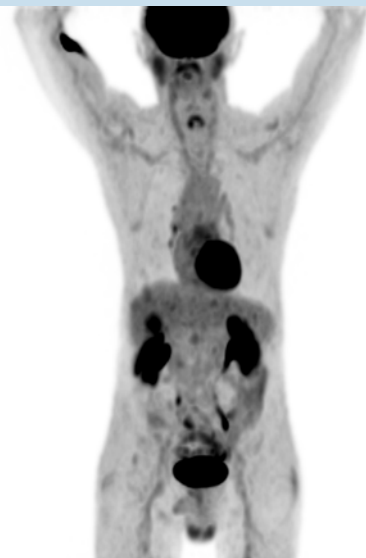


Cumulative Dose



Scan #17889

Total Dose: 500 to 2,800 mSv



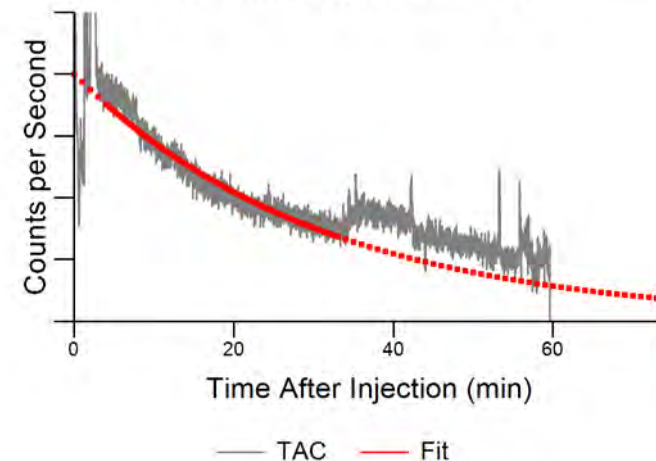
Isotope	F-18
Injection Method	Manual, IV
Injection Location	R Antecubital
Injected Activity	9.80 mCi
Radiotracer Volume	1.00 mL
Saline Flush Volume	10.0 mL
Imaging Time	71.0 min
% Extravasation	27 %
Initial Activity	2.65 mCi
Imaging Time Activity	0.17 mCi
Reabsorption Rate	21.4 min
Dose Calculation Volume	11.00 and 1.00 cm ³
Dose Rate	8.7 and 84.4 mSv/mCi-min
Total Dose	500 to 2,800 mSv

An 80-year-old male presented with a history of bladder carcinoma that had metastasized to the liver. Initial follow-up imaging was determined to be relatively non-diagnostic in quality due to a significant extravasation observed on imaging and external injection monitoring.

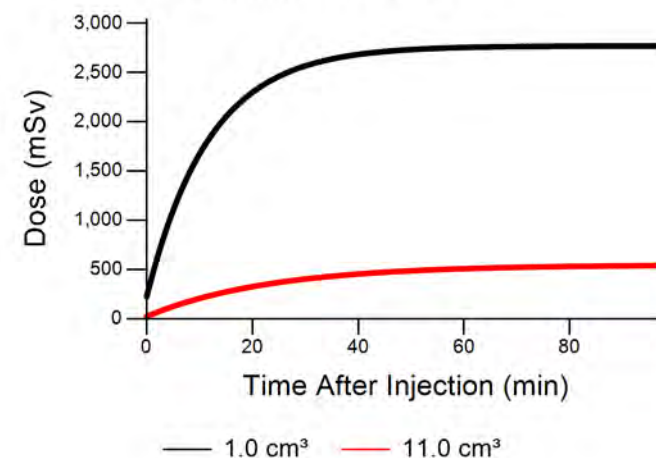
The extravasated injection consisted of 9.8 mCi of 18F-FDG in the right antecubital using an IV. The dose to the injection site tissue was estimated to be 500 to 2,800 mSv.

PET/CT scanning was repeated the following day. The repeat imaging confirmed disease progression and identified additional uptake not seen in the prior extravasated scan—including an upper liver lesion, increased hilar node activity, and prostate uptake. Quantitative results showed an average increase in SUVmax of approximately 25%.

TAC with Exponential Fit

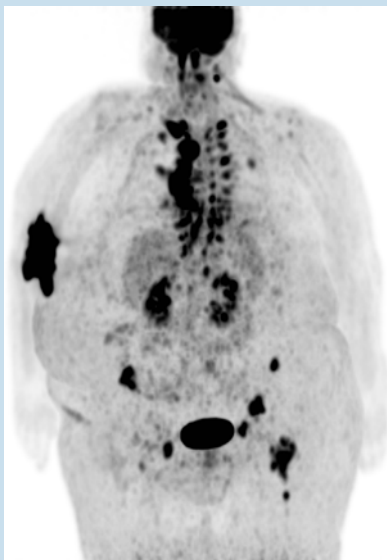


Cumulative Dose



Scan #17967

Total Dose: 1,900 to 6,500 mSv



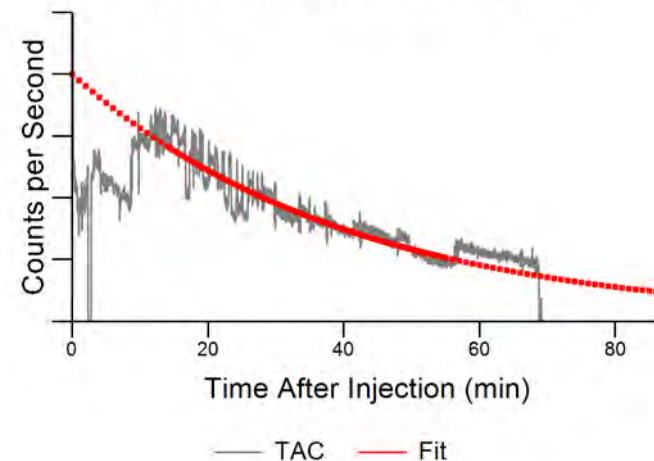
Isotope	F-18
Injection Method	Manual, IV
Injection Location	R Antecubital
Injected Activity	10.10 mCi
Radiotracer Volume	1.00 mL
Saline Flush Volume	40.0 mL
Imaging Time	76.0 min
% Extravasation	100 %
Initial Activity	10.10 mCi
Imaging Time Activity	3.75 mCi
Reabsorption Rate	28.1 min
Dose Calculation Volume	42.00 and 2.00 cm ³
Dose Rate	2.4 and 43.7 mSv/mCi-min
Total Dose	1,900 to 6,500 mSv

A 61-year-old female presented with a history of breast cancer and malignant right pleural effusion. Follow up imaging identified possible bone involvement and additional PET/CT imaging was ordered. The restaging PET/CT injection was deemed non-diagnostic due to identification of a significant infiltration based on Lara TACs and a large area of activity observed in the arm of the patient.

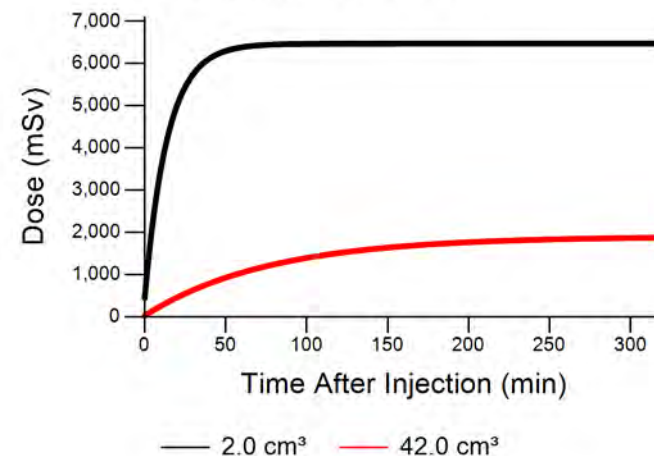
From the extravasated 18F-FDG injection, arm tissue was estimated to have received between 1,900 and 6,500 mSv of dose.

Repeat PET/CT imaging was ordered, and the patient was imaged five days later. Follow up imaging showed diffuse metastatic disease with bone involvement and confirmed further disease progression.

TAC with Exponential Fit

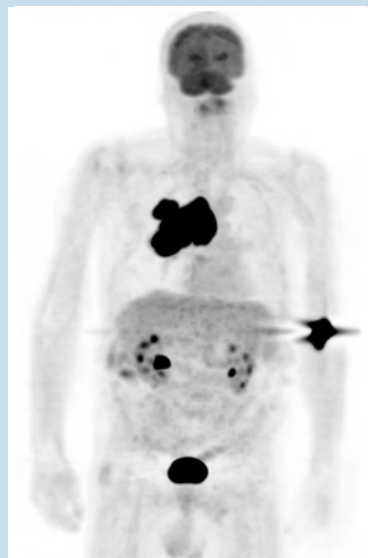


Cumulative Dose

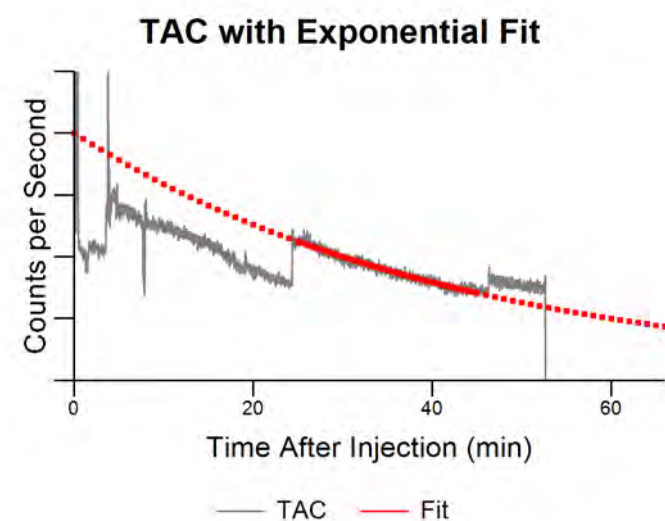


Scan #18642

Total Dose: 4,300 to 6,600 mSv



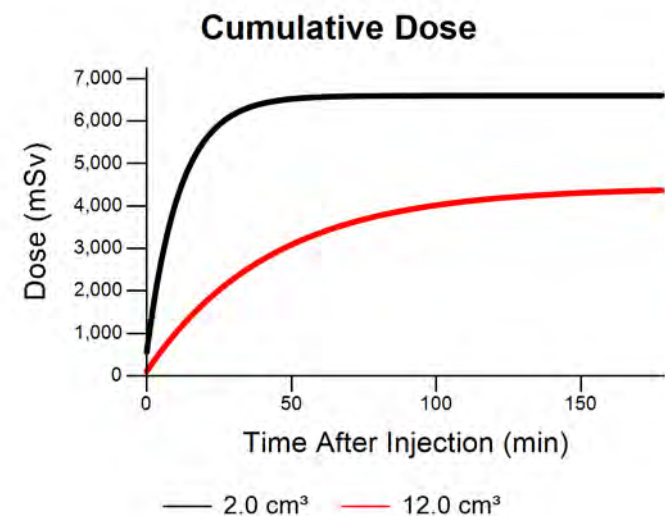
Isotope	F-18
Injection Method	Manual, IV
Injection Location	L Antecubital
Injected Activity	12.82 mCi
Radiotracer Volume	1.02 mL
Saline Flush Volume	10.0 mL
Imaging Time	60.0 min
% Extravasation	100 %
Initial Activity	12.82 mCi
Imaging Time Activity	4.07 mCi
Reabsorption Rate	30.0 min
Dose Calculation Volume	12.04 and 2.04 cm ³
Dose Rate	8.0 and 42.9 mSv/mCi-min
Total Dose	4,300 to 6,600 mSv



The patient was injected in the left antecubital fossa with 12.82 mCi of 18F-FDG consisting of 1.02 mL. The injection was followed by 10 mL of saline flush.

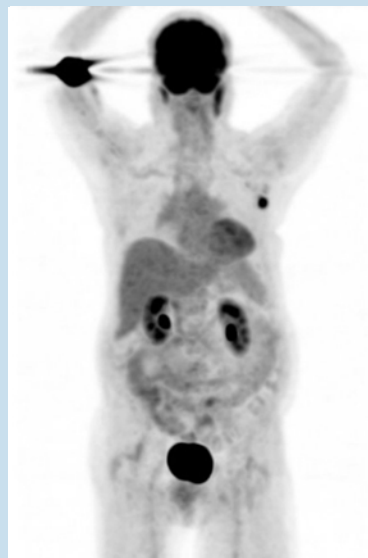
The time-activity curve indicated likely presence of residual activity at the injection site. After 60 minutes of uptake, PET imaging was performed and confirmed significant radioactivity in the left antecubital.

Based on the static PET imaging and time activity curve, initial extravasation severity was estimated to be 100%. For tissue volumes of between 2 and 12 cm³, dose was calculated to be between 4,300 and 6,600 mSv.

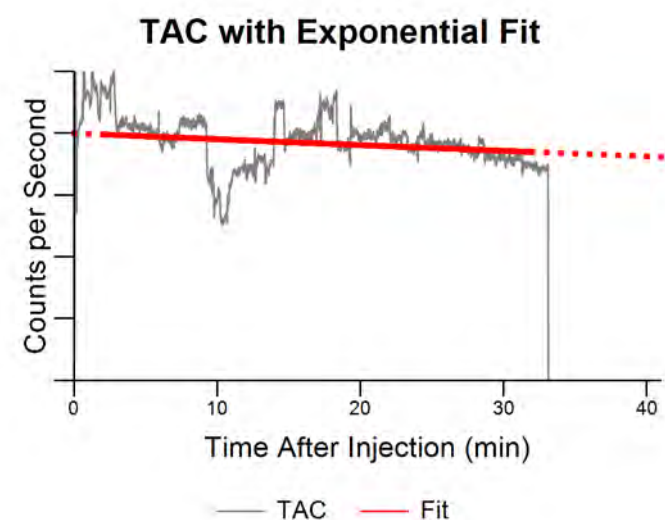


Scan #19110

Total Dose: 600 to 1,600 mSv



Isotope	F-18
Injection Method	Manual, IV
Injection Location	R Antecubital
Injected Activity	14.77 mCi
Radiotracer Volume	1.50 mL
Saline Flush Volume	20.0 mL
Imaging Time	65.0 min
% Extravasation	11 %
Initial Activity	1.62 mCi
Imaging Time Activity	0.91 mCi
Reabsorption Rate	281.7 min
Dose Calculation Volume	21.00 and 1.00 cm ³
Dose Rate	4.7 and 84.4 mSv/mCi-min
Total Dose	600 to 1,600 mSv



While undergoing PET/CT imaging with 18F-FDG, the patient was injected in the right antecubital with 14.77 mCi in a volume of approximately 1.5 mL. The injection was followed by a flush of 20 mL of saline.

Following the injection, the nuclear medicine technologist reported "No complaints of discomfort during injection."

Lara system output indicated a potential infiltration of the injection, which was confirmed by imaging the injection site. Based on the TAC, approximately 11% of the injected radioactivity is believed to have been infiltrated. Biological clearance was minimal. Tissue dose is estimated to be between 600 and 1,600 mSv.

The patient was called back for repeated PET/CT imaging two days later. The repeated procedure was not infiltrated and indicated that the infiltrated imaging study understated target lesion SUV measurements by 20%.

