

LABORATORY TESTS: SMALL BOWEL TRANSPLANT (CLIA-88)
UPDATED: SEPTEMBER 2019

CPT CODE: 78299

Indications: To determine rejection of a small bowel transplant. Rejection is indicated by a cumulative excretion of radiopharmaceutical in urine of > 2% @ 6 hours (2-4% nebulous, > 4% definitely abnormal). The study is performed post small intestine transplantation, routinely postoperatively and then every 7 days clinically indicated.

Patient Prep:

- If a nasal jejunal tube (NJ-tube) or alternative nasal gastric tube (NG-tube) is required it must be inserted prior to the first appointment if not already in place.
- NPO 2 hours before dose administration (first appointment) through 2 hours post dose administration.
- A urinary catheter will need to be in place if the patient is unable to prevent contamination of the urine collection.

Scheduling and Sample Collection

RESTRICTIONS: Wait 8 half-lives or 48 hours after a prior nuclear medicine examination that used a ^{99m}Tc radiopharmaceutical; wait longer if the T-1/2 is longer than ^{99m}Tc before scheduling unless approved by NM Staff MD. If there was a previous NM exam, get a 10 cc urine sample for a 5 minute background count to be used for subtraction.

1. Insure a NJ tube insertion is scheduled if the patient does not already have one unless ordering MD requests oral administration.
2. Injection is through the NJ (or NG as a second choice) tube.
 - If the 6-hour reading is to be called per order question, schedule the patient to arrive at 8:45AM for the injection through J-tube of Tc-DTPA. This may require the J-tube is inserted the day before.
 - If the 6-hour reading is not to be call the preferred injection time is before 3PM.
3. If the NJ tube was inserted for the study, injection could be done immediately post insertion based on the above requirements.
4. Instruct the floor that this a 24-hour urine collection at two timed set intervals noted below and to label each collection properly. Nuclear Medicine will pick up the collected urine.
 - a. The first interval is the next 6 hours (6 hours total).
 - b. The second interval is 6 to 24 hours (18 hours total).

NOTE:

- It is imperative that **ALL** urine is collected and labeled appropriately with the patients Name **AND** MR number **OR** Birth date.
- Any loss of sample must be noted on the report. The interpreting physician will determine if loss of sample nullifies the results.
- Urine specimen will be transported in leak proof container using universal protection procedure.

Radiopharmaceutical

& Dose: Adult: Tc-^{99m}-DTPA 500 µCi +/- 20% (400-600 µCi) in 10 ml
Pediatric: 250 µCi +/- 20% (200-300 µCi) in 5 ml

No weight-based dosing scheme is applied to this test.

Dose Prep:

Prepare a Tc-DTPA dilution containing about 1.0 mCi diluting with purified water to yield 50 $\mu\text{Ci/ml}$ at administration. Quality control results of the DTPA should be > 98% within 1 hour of dose calibration time.

1. Place 1 mCi DTPA (calibrated @ time of administration) in a centrifuge vial, or equivalent. Assay and note volume V_{DTPA} .
2. Add purified water to make 50 $\mu\text{Ci/ml}$ @ administration time and mix well.
Calculated V (H₂O added)=[(Assay #1 @ admin time in mCi)/0.05 (mCi/ml)] - $V_{\text{DTPA}}(\#1)$
3. Dispense a patient dose in a syringe with a luer lock cap.
4. Make counting standard (~10.0 ml).
5. Use a pipette for all manipulations in lieu of a syringe; the accuracy of the test is dependent on accurate volume measurements.

Standard Prep:

1. Assay the counting std (S) and accurately pipette 500 μL into a 250 ml volumetric flask.
2. Add purified water to the fill line of the flask. Mix well.
3. Dispense two 4 ml aliquots of the dilution for use as counting standards.
4. Label as standard and appropriate patient identifiers.

Administration:

1. Assay both dose (D) and dose (S) and record activity, date and time on Small Bowel Worksheet.
2. Transfer dose (D) to proper connecting syringe.
3. Insure the urine collection bag is emptied prior to injection.
4. Slowly administer the dose through J-tube (or alternate tube) with proper connecting syringe over 2 minutes and rinse with normal saline 10 ml (adult) or 5 ml (pediatric) to ensure quantitative administration of dose. The J-tube is then clamped or capped off for 6 hours. Retain both syringes and assay the residual activity and record on Small bowel worksheet. If more than 10 μCi (2%) remains, subtract this amount from administered activity and calculate the actual volume this actual administered activity represents. If the tube needs or has been removed earlier than 6 hours, note time on worksheet. No other steps are needed.

Counting/Measuring:

Record on the Small Bowel worksheet the total volume of each collect sample in a clean graduated type-A cylinder.

Background prep

Pipette two 4ml aliquots of H₂O in scintillation tubes and label as background using proper patient identifiers. Use these same tubes for both samples.

Measuring, 0-6 hr Sample(6-hr collection)

1. Mix well and pipette two 4ml aliquots in scintillation tubes.
2. Label appropriately as 0-6 hr sample with two patient identifiers.

Measuring, 6-24 hr Sample (18-hr collection)

1. Mix well and pipette two 4ml aliquots in scintillation tubes.
2. Label appropriately as 6-18 hr sample with two patient identifiers.

Counting

6-hour collection (when separate reading requested)

1. At 6 hours, place samples in gamma counter in order of, 2 bkgd; 2, 0-6 urine; 2, 6-18 urine; 2 std.
2. Count on program #7 for 5 minutes in Multi-wiper Well Counter.

6 and 18-hour collections

1. At 24 hours, place samples in gamma counter in order of, 2 bkg; 2, 0-6 urine; 2, 6-18 urine; 2 std.
2. Count on program #7 for 5 minutes in Multi-wiper Well Counter.

Data:

Use the Small Bowel Worksheet on the J drive under Nuclear Medicine folder. Print and scan completed datasheet into PACS.

Interpretation:

Normally < 1% of the administered dose is excreted in the first 6 hours and < 2% total at 24 hours. For transplant rejection, > 2% excretion is suggestive in the first 6 hours, > 5% for 24 hours.

**** Again, loss of samples may invalidate the procedure please note on final hard copy****

ACCURACY VERIFICATION: Two times per year two testing personnel will perform the test on a split patient sample when samples are available. The volume of this procedure could be less than 2 patients per year. Results will be reviewed and approved as acceptable by the Nuclear Medicine Service Chief. A copy will be given to the Point of Care Testing Coordinator.

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SMALL INTESTINE TRANSPLANT WORKSHEET (CLIA-88)
UPDATED: SEPTEMBER 2019

CPT CODE: N/A

PATIENT INFORMATION:

Name _____ MR# _____ Date _____

? (Date)	ACTIVITY	TIME	CORRECTED ACT	VOLUME ml
DOSE	? ()	? ()	*Error*	? ()
STANDARD	? ()	? ()	0.0	
BKG	? ()			
BKG	? ()		0.0	
URINE 0-6	? ()		0.0	
URINE 0-6	? ()		0.0	
URINE 6-24	? ()		0.0	
URINE 6-24	? ()		0.0	
STD DIL #1	? ()		0.0	
STD DIL #2	? ()		0.0	
TOTAL URINE 0-6	0.0	0-6 hr		? ()
TOTAL URINE 6-24	0.0	6-24 hr		? ()
COUNT TIME (min)		? ()		
NET URINE 0-6	0.0			
NET URINE 6-24	0.0			
MEAN NET STD DIL	0.0			
% IN URINE 0-6	From Excel wrkst			
% IN URINE 6-24	From Excel wrkst			
TOTAL 24 HR URINE	From Excel wrkst			

Processed _____

Reviewed _____

Discrepancies _____

SMALL INTESTINE TRANSPLANT WORKSHEET w/FORMULAS(CLIA-88)
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Dose assay and time _____ time _____ $\mu\text{Ci} = D$

Std. assay and time _____ time _____ $\mu\text{Ci} = S$

Volume of dose _____ ml = Vd

Bkg Count #1 _____ cpm

Bkg Count #2 _____ cpm Mean bkg _____ = A

Urine Count #1 _____ cpm

Urine Count #2 _____ cpm Mean urine _____ = B

Std Count #1 _____ cpm

Std Count #2 _____ cpm Mean Std _____ = C

Urine Collection time = $T_U =$ _____ hrs

Counting time = $T_C =$ _____ min

Total urine volume = _____ mL = V_u

CALCULATIONS

1. Decay correct std to same time as dose _____ $\mu\text{Ci} = S^*$

2. Decay correct urines (B) and stds (C) for counting time:

$B^* =$ _____ cpm $C^* =$ _____ cpm

3. Calculate % administered dose in urine

(Total cts urine)

% Administered = (Total cts dose) x 100 =

= $\frac{(B^* - A)(V_u)(S^*)}{V_d(C^* - A)(D)}$

x 0.2

4. Repeat for 6-24 hr collection and add to this value to get total.

Note: The Excel spreadsheet was built from this worksheet