UW Health
University of Wisconsin Hospital and Clinics

Division of Nuclear Medicine Procedure / Protocol

LABORATORY TESTS: SMALL BOWEL TRANSPLANT (CLIA-88) **CPT CODE: 78299**
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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, then every 7 days clinically indicated.

Patient Prep: NPO 2 hours pre dose and 2 hours post dose. Foley catheter in place for pediatric patients.

Scheduling and Sample Collection

RESTRICTIONS: Wait 48 hours after a prior examination has been performed using a technetium radiopharmaceutical, longer if T-1/2 is longer than Tc-99m before scheduling, unless approved by NM Staff MD. This is a lab test, so no gamma camera time is required.

1. Schedule the patient to arrive at 8:30 AM for the injection through J-tube of Tc-DTPA.
2. Instruct the ward to collect the patient's urine at two timed intervals:
   A. For the next 6 hours, discarding any urine collected prior to tracer administration. Collect all urine. After 6 hours, send collected urine to Nuclear Medicine. It must arrive by 3:00 PM. The 6 hour specimen is measured in a graduated cylinder and two (2) 4ml samples are pipetted into two (2) auto-gamma tubes and labeled appropriately.
   B. Urine collected from 6-24 hours post administration must arrive promptly at Nuclear Medicine the next morning. The 6-24 hour specimen is measured in a graduated cylinder and two (2) 4ml samples are pipetted into two (2) auto-gamma tubes and labeled appropriately.

NOTE: It is imperative that **ALL** urine is collected and labeled appropriately in the presence of the patient 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: Tc-99m-DTPA 400-600 µCi in 10 ml followed by up to 300 ml H_2O (250 µCi in 5 ml for pediatric patients). Minimum dose of 250 µCi. All doses should be checked with NM physician.

Dose Prep: Prepare a Tc-DTPA dilution containing about 1.0 mCi diluting with purified water to yield 50 µCi/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 µCi/ml @ administration time and mix well.
   Calculated V(H_20 added)=[(Assay #1 @ admin time in mCi)/0.05 (mCi/ml)] - V_{DTPA}(#1)
3. Dispense a patient dose in a syringe with a leur 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 dose (D) and record activity and time.
2. Administer the dose through J-tube with piston syringe, and rinse several times with 20 ml normal saline to ensure quantitative administration of dose. The J-tube is then clamped or capped off for 6 hours. Assay the residual activity and record. If more than 10 µCi (2%) remains, subtract this amount from administered activity and calculate the actual volume this actual administered activity represents.
3. Sometimes the dose will need to be administered via a G-tube.

Counting/Measuring:

Counting

1. At 24 hours, place samples in auto-gamma counter in order of, 2 bkg; 2, 0-6 urine; 2, 6-24 urine; 2 std.
2. Count on program #4 for 5 minutes in auto-gamma counter.

Alternative counting method is to count the samples in the probe/MCA. Set a R01 on the 140 Kev photopeak using one of the two standards (140 Kev with UL 154, LL 126). Turn the probe upright and set the tubes directly on the center of the crystal and count for 60 sec LT (live time). Count samples in above order.

Measuring, 0-6 hr Sample

1. Measure total urine volume in 0-6 hr sample and record on worksheet.
2. Mix well and pipette two 4ml aliquots in scintillation tubes.
3. Label appropriately as 0-6 hr sample with two patient identifiers.
4. Pipette two 4ml aliquots of H2O in scintillation tubes and label as background.

Measuring, 6-24 hr Sample

1. Measure total urine volume in 6-24 hr sample and record on worksheet.
2. Mix well and pipette two 4ml aliquots in scintillation tubes.
3. Label appropriately as 6-24 hr sample with two patient identifiers.

Data: Use the Small Bowel Worksheet on the J drive under Nuclear Medicine folder.

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 VERFICATION: 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.

Comments: * A Nuclear Medicine staff or resident physician should be consulted to determine if additional urine collection is indicated.

* All samples and standards will be labeled with appropriate patient identifiers as defined by clinical labs.

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