SPECIAL LABORATORY PROCEDURES
ABBEVILLE GENERAL HOSPITAL

Some laboratory tests involve patient preparation and special collection procedures in order to achieve accurate results. These may require patient home collection, ingestion of specific fluids before collection, or taking prescribed medications. A few of these tests are highlighted on the following pages.

1. CREATININE CLEARANCE TEST

INDICATIONS:
THE ENDOGENOUS CREATININE CLEARANCE TEST IS A MEASUREMENT OF THE GLOMERULAR FILTRATION RATE (GFR). IT IS USEFUL IN EVALUATION OF RENAL DISEASE AND IT IS MORE SENSITIVE THAN SERUM CREATININE LEVELS ALONE.

SPECIMEN COLLECTION & PREPARATION:
A PRECISELY TIMED URINE SPECIMEN AND A BLOOD SAMPLE ARE REQUIRED FOR THIS TEST. STORE URINE ON ICE WHILE IT IS BEING COLLECTED.

PATIENT PREPARATION:
1. HYDRATE THE PATIENT BY ADMINISTERING A MINIMUM OF 600 ML OF WATER.
2. WITHHOLD TEA, COFFEE, AND DRUGS ON THE DAY OF THE TEST.
3. HAVE PATIENT VOID AND DISCARD THE URINE. DOCUMENT THIS TIME, THIS IS THE START TIEM FOR THIS TEST.
4. COLLECT ALL URINE FOR THE NEXT 24 HOURS, BEGINNING WITH THE START TIME.
5. AT THE END OF THE 24 HOURS, HAVE THE PATIENT URINATE AND ADD THAT SPECIMEN TO THE CONTAINER.
6. COLLECT A BLOOD SAMPLE DURING THE URINE COLLECTION PERIOD.

SOURCES OF ERROR:
1. INCOMPLETE AND IMPROPERLY TIMED COLLECTION.
2. INADEQUATE HYDRATION OF PATIENT.
3. VIGOROUS EXERCISE DURING THE TEST.

EXPECTED VALUES: MALE: 90 - 139 ml/min/1.73 SQ.M
FEMALE: 80 - 125 ml/min/1.73 SQ.M

A PATIENT EDUCATION SHEET IS AVAILABLE FOR THIS PROCEDURE

2. O' SULLIVAN SCREEN

INDICATIONS:
SCREENING OF PREGNANT WOMEN FOR GESTATIONAL DIABETES MELLITUS SHOULD BE PERFORMED AT THE 28TH WEEK. THE PURPOSE OF THIS STUDY IS TO SCREEN PATIENTS FOR THOSE ON WHOM A FULL GESTATIONAL GLUCOSE TOLERANCE TEST SHOULD BE PERFORMED.

PRINCIPAL: THE SUBJECT IS GIVEN A ONE-HALF DOSE OF THE ORAL GLUCOSE CHALLENCE AND A ONE-HOUR POSTPRANDIAL BLOOD SPECIMEN IS TESTED FOR SERUM/PLASMA GLUCOSE CONCENTRATION.

PATIENT PREPARATION: NONE. (FASTING IS NOT REQUIRED.)

PROCEDURE:

1. ADMINISTER DOSE (0.5 OR ½ OF BOTTLE) IN CRUSHED ICE, ORALLY. INSTRUCT PATIENT TO CONSUME THE DOSE WITHIN 5 MINUTES OR AS QUICKLY AS POSSIBLE.
2. ONE-HOUR UPON COMPLETION OF THE ORAL GLUCOSE DOSE, OBTAIN A BLOOD SAMPLE.
3. PERFORM SERUM/PLASMA GLUCOSE DETERMINATION.

EXPECTED RESULTS:

A NORMAL POPULATION OF PREGNANT WOMEN IS EXPECTED TO HAVE A POSTPRANDIAL BLOOD SUGAR CONCENTRATION OF LESS THAN 150 mg/dl.

CERTAIN CONDITIONS (IMMEDIATE POSTPRANDIAL STATUS AT TIME OF TEST) MAY PRODUCE FALSE-POSITIVE RESULTS, HOWEVER, THESE PATIENTS, ALONG WITH THE HIGH-RISK PATIENTS, WILL BE ACCURATELY ASSESSED BY THE STANDARDIZED GLUCOSE TOLERANCE TEST.)

3. GLUCOSE TOLERANCE TEST

PRINCIPAL:
UNDER STANDARDIZED CONDITIONS RECOMMENDED BY THE NATIONAL DIABETES DATA GROUP, THE SUBJECT IS ADMINISTERED A GLUCOSE CHALLENGE, ORALLY, AND BLOOD GLUCOSE LEVELS ARE DETERMINED AT PRESCRIBED INTERVALS TO DETERMINE THE ABILITY OF THE SUBJECT TO HANDLE THE GLUCOSE LOAD. NORMAL PANCREATIC INSULIN RESPONSE RESULTS IN BLOOD GLUCOSE VALUES WITHIN PREDICTABLE RANGES. ABNORMAL PANCREATIC FUNCTION AND/OR GLUCOSE HANDLING RESULTS OUTSIDE THE PREDICTABLE RANGES.

VARIATIONS OF TESTS AND INDICATIONS:

1. STANDARD 2-HOUR GTT (RECOMMENDED BY NDDG)
75 GRAM GLUCOSE, PO, WITH SERUM GLUCOSE DETERMINATIONS AT 0, 0.5, 1.0, 1.5, AND 2.0, HOURS.
INDICATION: DIAGNOSIS OF DIABETES IN NON-PREGNANT ADULTS.

2. ORTHODOX 3-HOUR GTT (OBSOLETE)
75 GRAM GLUCOSE, PO, WITH SERUM GLUCOSE DETERMINATIONS AT 0, 0.5, 1.0, 1.5, 2.0, AND 3.0 HOURS. USE WILDERSON CRITERIA.
INDICATION: PHYSICIAN INSISTENCE.

3. GESTATIONAL GTT
100 GRAM GLUCOSE, PO, WITH SERUM GLUCOSE DETERMINATIONS AT 0, 1, 2, AND 3 HOURS.
INDICATIONS: FOLLOW UP TO POSITIVE O'SULLIVAN SCREEN FOR DIAGNOSIS OF GESTATIONAL DIABETES MELLITUS. (NOTE: MUST HAVE STANDARD GTT FOLLOW-UP AFTER PREGNANCY IS TERMINATED FOR POSITIVE RESPONDERS.)

4. 5 HOUR GTT
75 GRAM GLUCOSE, PO, WITH SERUM GLUCOSE DETERMINATIONS AT 0, 0.5, 1.0, 1.5, 2.0, 3.0, 4.0, & 5.0 HOURS. INSULIN LEVEL ON FASTING SAMPLE.
INDICATION: DIAGNOSIS OF HYPOGLYCEMIA.

5. PEDIATRIC GTT
1.75 GRAMS/KG (MAX: 75GM), PO, WITH SERUM GLUCOSE DETERMINATIONS AT 0, 0.5, 1.0, 1.5, & 2.0 HOURS.
INDICATIONS: DIAGNOSIS OF DIABETES MELLITUS IN CHILDREN LESS THAN 16 YEARS OF AGE.

PATIENT PREPARATION

1. UNRESTRICTED DIET (GREATER THAN OR EQUAL TO 150 gm CARBOHYDRATE) FOR THREE DAYS (UNLESS PREVIOUSLY DONE)
2. FASTING STATUS: AT LEAST 8 HOURS, NO MORE THAN 14 HRS.
3. START TEST IN MORNING

4. NO SMOKING BEFORE AND DURING THE TEST

CHALLENGE DOSE

THE APPROPRIATE GLUCOSE DOSE IS GIVEN (e.g. NON-PREGNANT ADULT WOULD GET 7.5 OR ¾ OF A BOTTLE OVER 5 MINUTES OR LESS. DISCONTINUE THE TEST IF EMESIS OCCURS; NOTIFY ATTENDING PHYSICIAN.

SPECIMENS

5cc VENOUS BLOOD TO BE OBTAINED AT EACH OF THE INDICATED SAMPLING TIMES.

PROCEDURE:

1. PREPARE DOSE AND CHILL THOROUGHLY.
2. DRAW BLOOD AND HAVE PATIENT COLLECT URINE SAMPLE.
3. PERFORM URINE GLUCOSE DETERMINATION (MULTISTIX).
4. PERFORM FASTING BLOOD SUGAR, BEFORE ADMINISTERINGGLOCOSE DOSE, IF URINE TEST IS POSITIVE.

FBS VALUE	**ACTION**
LESS THAN 200	**PROCEED WITH GTT**
>200 & <250	**CALL PHYSICIAN TO GET CLEARANCE TO PROCEED**
>300	**DO NOT GIVE DEXTOL DISCONTINUE GTT. NOTIFY DR.**

5. ADMINISTER DOSE IF URINE GLUCOSE IS NEGATIVE
6. INSTRUCT PATIENT ON NO SMOKING OR AMBULATION.
7. OBSERVE PATIENT FOR SYMPTOMS OF HYPOGLYCEMIA OR OTHER CLINICAL SIGNS OF DISTRESS - RECORD POSITIVE RESULTS.
8. COLLECT BLOOD SAMPLES. LABEL SAMPLES WITH PATIENT IDENTIFIERS AND THE TIME OF COLLECTION.
9. PERFORM GLUCOSE TESTING ON BLOOD SAMPLES
10. RECORD RESULST IN THE L.I.S

PANIC VALUES: GREATER THAN 500 MG/DL

THE FOLLOWING INFORMATION SHOULD ALSO BE REPORTED TO THE ATTENDING PHYSICIAN:

1. FASTING BLOOD SUGAR OVER 200 MG/DL (BEFORE STARTING ORAL GLUCOSE INGESTION).
2. ADVERSE CLINICAL FINDINGS DURING THE TEST:
   a. FAINTING
   b. SOMNOLENCE AND INABILITY TO AROUSE

4. THERAPEUTIC DRUG MONITORING (TDM)

PURPOSE:
MEASUREMENT OF BLOOD CONCENTRATION OF PRESCRIBED DRUGS IN ORDER TO MAINTAIN THE DESIRED THERAPEUTICALLY EFFECTIVE DRUG LEVEL.

INDICATIONS:

1. IDENTIFICATION OF PATIENTS' NONCOMPLIANCE WITH MEDICATION.
2. IDENTIFICATION OF FAST AND SLOW METABOLIZERS.
3. DETECTION OF ALTERED DRUG UTILIZATION DUE TO GASTRO-INTESTINAL, CARDIAC, HEPATIC OR RENAL DYSFUNCTION, DRUG INTERACTIONS, CHANGE OF DRUG'S BRAND OR DOSAGE, ETC.
4. DOSAGE ADJUSTMENT AFTER CHANGE IN PHYSIOLOGICAL STATES LIKE PREGNANCY, MATURATION (BETWEEN AGES OF 10 AND 13) AND OLD AGE.
5. DOSAGE ADJUSTMENT AFTER OBSERVATION OF LACK OF THERAPEUTIC EFFECTS OR EVIDENCE OF DRUG TOXICITY.
6. BASELINE MEASUREMENT FOR COMPARISON WITH FUTURE VALUES, WHEN PATIENT IS PLACED ON LONG-TERM THERAPY.

SPECIMEN COLLECTION

COLLECT 5ml HEPARINIZED BLOOD FOR PLASMA (IN GREEN TOP TUBE) OR 5ml CLOTTED BLOOD FOR SERUM (IN RED TOP TUBE)

IN GENERAL, DRAW BLOOD DURING 1/2 HOUR BEFORE ADMINISTRATION OF THE NEXT SCHEDULED DOSE. THE VALLEY (OR TROUGH) BLOOD LEVEL IS THE MOST REPRODUCIBLE LEVEL TO MEASURE AND IT IS ADEQUATE FOR MONITORING OF MOST THERAPEUTIC DRUGS.

ALWAYS LIST IN THE ORDER ENTRY THE DOSAGE SCHEDULE AND THE TIME OF THE LAST DOSE. IT IS IMPOSSIBLE TO INTERPRET THE TEST RESULTS WITHOUT THE KNOWLEDGE OF THE TIME ELAPSED BETWEEN DRUG ADMINISTRATION AND THE TIME OF DRAWING OF THE BLOOD SPECIMEN.

TDM SHOULD START ON A PATIENT ONLY WHEN THE STEADY STATE DRUG CONCENTRATION IS REACHED. IT REQUIRES ABOUT 5 HALF-LIVES OF DRUG ADMINISTRATION (ABOUT 5 DRUG DOSAGES) BEFORE THE STEADY-STATE BLOOD LEVEL IS ACHIEVED AND STABILIZED.