Policies/Specimen Collection and Preparation-NMMC

Cancellation of Tests
Cancellations received prior to test setup will be honored at no charge. Requests received following test setup cannot be honored. A report will be issued automatically and charged appropriately.

General Laboratory Procedures/Policies (Inpatients)
The facilities of the laboratory, for use of a physician in the establishment or confirmation of diagnosis of disease or injury, are located on the first floor of the hospital. The department is open and adequate personnel are on duty 24-hours a day, 7-days a week.

REQUISITIONS:
Requests for laboratory procedures are to be made using the Hospital Information System (HIS) and the established protocol for it. If the HIS is down, follow the protocol for backup procedures.

Requests for work ordered for today, this p.m.; tonight, this a.m.; STAT, now; for surgery, etc., should be ordered immediately.

The laboratory is responsible for collecting specimens on all outpatients.

Emergency Services Department (ESD) is responsible for collecting specimens on all ESD patients. The laboratory is responsible for collecting specimens on the majority of inpatients, with exceptions being MDRO patients, ICU patients and other inpatients whose specimens must be drawn from line or venous access device (VAD). Nursing personnel in ICU prioritize requests and collect specimens at the appropriate times. Barcode labels for these requests will print on barcode labeler on appropriate nursing unit. Laboratory personnel are available to assist with difficult specimen collections.

Specimen Rejection Criteria
To ensure accurate test results, NMMC may be unable to accept a specimen for analysis based on certain pre-analytic conditions. Some of the circumstances that may result in rejection of the specimen are listed below. We regret any inconvenience to you or the patient being tested, but specimen integrity is paramount in achieving accurate test results.

- Specimen and/or requisition improperly labeled
- Specimen collected at wrong time
- Specimen collected in wrong tube or container
- Specimen submitted with inadequate volume
- Specimen improperly transported or stored
- Specimen type is incorrect for test requested
- Specimen container cracked or leaked
- Specimen contaminated by IV fluid
- Specimen hemolyzed
- Specimen clotted in anticoagulant tube

Tests Referred to Another Laboratory
There are some tests not performed at NMMC. We have contracted appropriate reference laboratories to provide these services. A nominal handling fee will be added to the charges from the reference laboratory.

Test Turnaround Time
This catalog lists the days on which the test is set up as a guide to expected analytical turnaround times. Repeated tests take additional time. If defined analytical turnaround times will not be met by the testing laboratory, you will be notified.

Specimen Collection
BLOOD COLLECTION:
Most laboratory tests are performed on anticoagulated whole blood, plasma, or serum. Please see our individual test directory section for specific requirements.

- Plasma: Draw a sufficient amount of blood with the indicated anticoagulant to yield the necessary plasma volume. Gently mix the blood collection tube by inverting 6 to 10 times immediately after draw. If required, separate plasma from cells by centrifugation within 20 to 30 minutes.
• **Serum**: Draw a sufficient amount of blood to yield the necessary serum volume. Allow blood to clot at ambient temperature, and then, separate serum from clot by centrifugation within 20 to 30 minutes. Caution: avoid hemolysis.

• **Whole Blood**: Draw a sufficient amount of blood with the indicated anticoagulant. Gently mix the blood collection tube by inverting 6 to 10 times immediately after draw.

• The Pathology Department and Nursing are responsible for drawing blood specimens. In certain situations, other departments or clinics may draw blood specimens. Other types of specimens may also be drawn by clinics or departments other than Pathology.

• The accuracy of any laboratory determination is dependent upon the integrity of the specimen on which it is performed. Detailed drawing procedures are included in the NMMC Pathology Directory of Services hard copy and hospital internet. If there are questions, please call the laboratory. If these instructions are strictly followed, the quality and quantity of the specimens received by the laboratory will be appropriate.

• The minimum volume listed is sufficient for the performance of the analysis 1 time only. If the minimum volume is submitted, the laboratory will be unable to repeat the analysis in the event of technical difficulty or for the verification of abnormal results.

• If we receive specimens which are inappropriate for assay, we may request a new specimen to assure valid results.

• Specimens may be rejected for many reasons, including the following:
  — Hemolyzed or lipemic
  — Collected in incorrect container
  — Anticoagulated specimen is clotted
  — Received beyond delivery time limits given with individual test listing
  — Total volume not recorded for aliquot of 24-hour urine specimen
  — Unlabeled or improperly labeled

**SPECIFIC COLLECTION CONSIDERATIONS:**

• The following is a list of tubes referred to in NMMC’s specimen requirements:
  — **Light Blue-Top (Sodium Citrate) Tube**: This tube contains sodium citrate as an anticoagulant—used for collection of blood for prothrombin time, partial thromboplastin time and other coagulation studies.

  **Note**: It is imperative that tube be completely filled. Ratio of blood to anticoagulant is critical for valid prothrombin time results. Immediately after draw, invert tube 6 to 10 times in order to activate anticoagulant.

  — **Grey-Top (Potassium Oxalate/Sodium Fluoride) Tube**: This tube contains potassium oxalate as an anticoagulant and sodium fluoride as a preservative—used to preserve glucose, alcohol, and lactic acid.

    **Note**: After tube has been filled with blood, immediately invert tube several times in order to prevent coagulation.

  — **Green-Top (Lithium Heparin) Tube**: This tube contains lithium heparin as an anticoagulant—used for collection of blood for basic metabolic panel and ammonia.

    **Note**: After tube has been filled with blood, immediately invert tube several times in order to prevent coagulation.

  — **Lavender-Top (EDTA) Tube**: This tube contains liquid EDTA (ethylenediamine tetracetic acid) and potassium sorbate as an anticoagulant—used for hematology and blood bank testing.

    **Note**: After tube has been filled with blood, immediately invert tube several times in order to prevent coagulation.

  — **Red-Top Tube**: This tube is a plain VACUTAINER® containing no anticoagulant—used for any test requiring collection of serum.

  — **Serum Gel Tube**: This tube contains a clot activator and serum gel separator—used for various laboratory tests. Serum gel tubes are not acceptable for Blood Bank testing and a few other tests, but may be used for most tests requiring serum.

    **Note**: Invert tube to activate clotting; let stand for 20 to 30 minutes before centrifuging for 10 minutes. If frozen serum is required, pour off serum into plastic vial and freeze. Do not freeze VACUTAINER® tubes.

Serum gel tubes are not acceptable for Blood Bank testing and a few other tests, but may be used for most tests requiring serum.

**Blood:**

If a whole blood specimen is requested, draw the blood in the recommended vacuum tube. Allow the tube to fill completely, then gently invert several times.
**Plasma:**
Plasma is the liquid portion of unclotted or anticoagulated blood. If a plasma specimen is requested, draw the blood in the recommended vacuum tube. The amount of blood should be 2 1/2 times the volume of plasma requested. Allow the tube to fill completely then gently invert several times. Centrifuge the specimen for 10 minutes, and separate the plasma within 1 hour into a plastic transfer tube for delivery to the laboratory. Refer to the individual test listing for specific information on refrigeration or freezing of specimen.

**Serum:**
Serum is the liquid portion of clotted blood to which no anticoagulant has been added. If a serum specimen is requested, draw the blood in a red-top vacuum tube of sufficient volume to yield the proper amount of serum. The amount of blood drawn should be 2 1/2 times the volume of serum requested. Allow the blood to clot for 30 to 45 minutes, then centrifuge for 10 minutes. Separate the serum, being careful not to transfer any cells, into a plastic transfer tube for delivery to the laboratory. For serum gel tubes, it is not always necessary to separate serum for transport to the laboratory. Refer to individual test listing for specific information on refrigeration or freezing of specimens.

A clear serum or plasma specimen is desired. Hemolyzed or lipemic specimens can invalidate certain procedures. Upon receiving an inappropriate specimen, we may request a new specimen to assure valid results.

When centrifuging specimens, assure that the centrifuge utilized is appropriate for the size tube(s) being centrifuged.

**Specimen Labeling/Transportation**
- All specimens must be properly labeled. Refer to “Proper Labeling of Laboratory Specimens” Policy, refer to table of contents for appropriate section.
- Accrediting agencies require the laboratory to reject a specimen for analysis if it is not properly identified.
- Specimens delivered to laboratory by Nursing Services:
  - 24-Hour urine specimens
  - Body fluids, ie, pleural fluids, cerebrospinal fluids, paracentesis fluid, thoracentesis fluid, etc.
  - Sputum specimens
- Specimens picked up by laboratory personnel at Nursing Unit specimen room or sent via pneumatic tube:
  - Blood specimens
  - Random urine specimens
  - Stool specimens
  - Culture swab

**Charting**
Laboratory results will be charted under the gold lab index tab divider for NMNC Charts.

- **Computer Entered Results:**
  - All routine results that are on-line in MIS/SCM should be entered and released on a timely basis by appropriate Laboratory personnel. All stat results should be entered and released immediately upon completion of testing by appropriate Laboratory personnel.

- **Scheduled Routine Charting Times:**
  - All finalized laboratory results not interfaced to HIS will be charted daily by 1430.
  - A cumulative “Lab Results Summary” is retrievable in HIS in video form and is filed in SRM.

- **STAT Charting:**
  - All STAT laboratory results not reported via HIS will be charted or faxed when results are available. Laboratory personnel charting any manual report will place their initials and the time charted on the chart copy of the report. The date must also be indicated if different from the testing performed date. STAT results that have been phoned are documented as such on the report.
  - STAT and timed results that have been interfaced in HIS are retrievable in patient’s chart.

- **Order of Charting for Manual Laboratory Reports:**
  - Reports not generated by the HIS are charted manually. They are placed on the chart by Pathology personnel behind the computer generated reports.

- **Daily Cumulative Lab Summary:**
  - At midnight, a daily Cumulative Lab Summary report is generated in the HIS system for each nursing unit. For patients who have been an inpatient over 14 days, permanent copies are generated on the nursing unit on Friday night and at 14 day intervals thereafter. This report includes all results entered since the patient’s admission through day fourteen (14). On day fifteen (15), a new Cumulative Lab Summary will begin. Only the most current generated Lab Cumulative Summary is kept filed in the HIS.
• Chart Identification:
  — Two patient identifiers (such as name and medical record number) should be checked against lab report before it is placed on the chart.

• Identification of Person Charting:
  — After placing a report on patient’s chart, the person charting should note their initials and time charted. Date should also be noted if other than date testing performed

• Charting Errors:
  — Manual Charting Results Error:
    If a charting error occurs, the report is stamped - VOID, Charting error. Another report will be rendered and will be placed on the correct chart.
  — Manually Charted Lab Result Error:
    If the results on a manual laboratory report are incorrect and already charted, check to see if results have been communicated to anyone in any manner. The report and copies are stamped “VOID-invalid results, please refer to corrected report”. A corrected report will then be placed on the chart, in the files and appropriate parties notified. Pertinent documentation such as person notified, date, time, and initials must be indicated on all copies.
  — Computer-Entered Lab Results Errors:
    If an incorrect result has been entered in the LIS, erroneous results must be replaced with correct results or the statement, “Previous Results Entered Here in Error” (PRE). A corrected report will be available in HIS but physician and/or nurse in charge of patient should be notified to assure appropriate patient care.

• Final Cumulative Laboratory Summary:
  — At approximately 6:30 a.m. on the morning following a patient’s discharge or expiration, a Discharge Cumulative Laboratory Summary report will be electronically transmitted to HIS. This report will include all results entered on the patient since admission and will include any results entered after discharge/expiration, but prior to the printing time of the Discharge Lab Summary.
  — Some reports will be completed after the Discharge Summary. These will be printed in the laboratory and in HIS and will be labeled “Supplemental Report.” A copy will be sent to the ordering physician’s office by the laboratory.
  — Women’s Hospital (WH):
    WH Reports are handled in manner identical to that outlined previously.
  — Outpatient and Emergency Services Department Patients:
    These will be single reports on white paper printing in the appropriate location. This will be the permanent chart copy. A copy of these reports will print in the laboratory and will be sent to the ordering physician’s office by fax or courier.

• Donor Laboratory Results:
  — All organ donor lab results are designated as “Organ Donor”. Reports are sent to HIS to be scanned into patient’s chart in SRM. Reports are maintained in LIS.

Priority Testing Definitions
The laboratory adheres to the overall hospital guidelines for definitions for “STAT,” “Now,” “Time Critical,” and “Routine” as stated below:

STAT-Patient Emergency-drop everything and attend to
NOW-An order that should be implemented within 1 hour upon the department receiving that order, or immediately following the procedure presently being performed.
TIME CRITICAL- Performed as close to ordered time as possible but not more than 30 minutes before or after
ROUTINE- Will be drawn within 6 hours of order.

If there are any exceptions to the above 4 words in needing to place or write an order, the following guideline is offered as a suggestion:

If the procedure is to be implemented or results reported by a specific date and time, please indicate the specific date and time rather than use generalities such as “early AM” or “early PM.” The department will advise if it is impossible to complete these tests or procedures by the specific date and time.

The laboratory will make available results to be performed as “Chart by 7:00 a.m.” for the following procedures:

CBC (and components), PT, PTT, Heparin Xa, Fibrinogen, Retics, Basic Chemistry Profiles (and components), Cardiac Function Tests, Therapeutic Drug Monitoring Tests, and Urinalysis

These are to be requested as “Chart by 7:00 a.m.”
Criteria for Rejection of Unacceptable Specimens

- All specimens (blood, cerebrospinal fluid, urine, cultures, tissues, etc.) must be clearly labeled with the patient’s full name, identifying number, and date. The Laboratory will not process any specimen without satisfactory labeling by the collecting party. A report will not be issued until the exact identity of the specimen can be verified.
- Specimens will not be accepted by the laboratory for testing unless accompanied by the proper request from a physician. This includes employees who wish to have laboratory work done. We will accept verbal orders, but these must be followed by written orders within 30 days. Under specified conditions, the laboratory will perform non-medically requested chemical analysis. See separate policy and consent form for this purpose.
- No specimens will be accepted without proper requisition—patient’s name, identifying number, physician, source and type culture or smear requested, or type of test required.
- Any specimen for culture received in an unsterile container should be rejected.
- Any sputum specimen for culture which is obviously saliva and not “deep cough” sputum will not be accepted.
- Any specimen showing gross external contamination will not be accepted.
- Any swabs for culture which appear to be dried out or which lack contact with transport medium will be rejected.
- Semen specimens are preferred between 7:00 a.m. to 10:00 a.m. Monday through Friday. Specimens will be accepted at other times if necessary. Supervisors must be aware so that proper attention can be given. Specimens must be delivered to the laboratory within 1 hour of the time collected. Specimen must be collected in a clean glass or plastic container. The laboratory will not accept semen delivered in a condom.
- Urines on small children should be collected by the use of pediatric bags. The laboratory will not accept specimens contaminated with feces or those wrung from a diaper.
- Urine specimens for pregnancy testing which contain gross blood are not acceptable due to false results due to blood. If a voided specimen which does not contain blood cannot be obtained, a catheterized specimen will be required.
- iSTAT specimens collected in heparinized evacuated tubes that are over 10 minutes old.
- Blood specimens which have an inadequate amount of blood for the amount of anticoagulant in the VACUTAINER® tube will not be accepted. Clotted specimens will not be accepted for testing in which clotting interferes with testing.
- Clotted body fluids for cells counts are not acceptable; however, if unable to obtain another specimen, indicate on report that specimen was clotted and results are inaccurate due to clotted specimen. The fluid must be collected in a green-top (lithium heparin) tube or a lavender-top (EDTA) tube.
- PTT specimens not delivered to the laboratory within 1 hour of the time drawn will not be accepted unless centrifuged and plasma refrigerated or frozen.
- Prot ime specimens not delivered to the laboratory within 24 hours of the time drawn will not be accepted unless centrifuged and plasma refrigerated or frozen.
- Blood specimens for Chemistry, Special Chemistry, or Serology should be delivered to the laboratory as soon as possible after collection. The laboratory will not accept specimens which are not delivered promptly unless the serum has been separated from the cells.
- The department will not accept blood specimens which have not been drawn according to the criteria listed in the Pathology Directory of Services. It is imperative that this criteria be followed due to the fact that some of the tests are affected if not drawn in the proper tube.
- Hemolyzed blood specimens are not acceptable for chemical analysis or coagulation studies. If unable to get a better specimen, indicate on the report that the specimen was hemolyzed and results may be inaccurate due to hemolysis of blood.
- Specimens for routine tissue examination are to be placed in 10% formalin before being delivered to the laboratory. If a frozen section is desired, the specimen must be fresh and unfixed. Specimens are to be placed in a specimen container. Do not deliver specimens in pans or basins.
- Cytology specimens which are not properly labeled with the type and source will not be accepted until such information can be obtained.
- Cytology specimens which have been improperly stored (no fixative or no refrigeration) will not be accepted.
  - Laboratory requisitions or barcode labels must include the time, date, and initials of the person who collects any specimen (initials are not required on requests from outreach clients and are designated as “NLC”-“not laboratory collected”).
Specimens which are not accompanied by requisitions or barcode labels containing this information will not be accepted.

- A log of unacceptable specimens is maintained and monitored in each section. Corrective action and disposition is documented and reviewed monthly by Section Supervisors.

**Note:** Any specimen received that is determined to be unacceptable by these criteria should be held until communication with appropriate personnel (Nursing, physician, etc.) has taken place. In the event another specimen cannot be obtained, it may be necessary to process this specimen with a qualifying statement on the report.

- Any formed fecal specimen for *Clostridium difficile* PCR testing will be rejected.

- The following specimens will be rejected if sent via pneumatic tube:
  - Blood specimens for PTT testing for patients on heparin
  - Blood specimens for Platelet Function testing
  - Blood specimens for Heparin Xa testing
  - Blood specimens for PBLOC

- Nasal swabs for MRPCR must be collected using COPAN swabs. Other collection swabs will be rejected.