About National Reference Laboratory

National Reference Laboratory (NRL) is a Mubadala Healthcare initiative, created in partnership with and operated by Laboratory Corporation of America (LabCorp), one of the world’s largest and most experienced clinical laboratory operators.

NRL aims to increase the spectrum, coverage and overall efficiency of laboratory testing, and implement international best practice reference laboratory testing processes. Together with the significant resources of the LabCorp network, NRL offers a comprehensive menu of more than 4,000 tests. NRL is committed to driving improvement in the quality standards of medical diagnostic testing in the region by investing in the latest technologies and acting as a trusted resource for healthcare providers. NRL has laboratories based in Abu Dhabi located in the Industrial City of Abu Dhabi and Dubai in the Nucleotide Complex of Dubai Biotechnology and Research Park (Dubitech). Together, they comprise 32,000 square feet of laboratory space with both standard and advanced testing capabilities, offering healthcare providers in the region a one-stop solution for all of their medical diagnostic testing needs. NRL’s Abu Dhabi facility is CAP (College of American Pathologists) accredited whilst our Dubai facility boasts both the CAP and ISO 15189 Accreditations.

Contact details:
T. +971 800-NRL (675)
E. customercare@nrl.ae
www.nrl.ae

Operating hours:
Saturday to Thursday 8AM to 10PM

Abu Dhabi (Headquarters)
Abu Dhabi Business Hub
Unit C25/26
ICAD, Abu Dhabi
P.O. Box 92323, Abu Dhabi, UAE
Opening Hours: Saturday to Thursday
Specimen pick-ups: 8 AM to 9 PM

Dubai
Dubai Science Park
Nucleotide Lab Complex
Ground Floor Lab Number 0013
P.O Box 2087, Dubai, UAE
Opening Hours: Saturday to Thursday
Specimen pick-ups: 8 AM to 9 PM

Consultation on ordering and interpretation of examination results:
Contact NRL Technical Support

Client Concerns/Complaints/Suggestions:
Contact NRL Technical Support
**Test Ordering**

We provide two ways to clients for test ordering:

- Online test ordering through Cerner Webconnect - advanced Laboratory Information System (LIS)
- Test Requisition Form (alternative)

**Ordering test online – Cerner Webconnect**

We are very proud to be able to offer the facility for online test ordering through an advanced Laboratory Information System (LIS) – Cerner Webconnect. The online test ordering is the easiest way to order your tests and avoid delays and manual errors. Your team will be trained on how to use the system by your NRL Business Development Executive. A WebConnect Cerner manual will be provided to refer to for more information.

**Completion of Test Requisition Form**

To ensure there are no delays in specimen processing and possible specimen rejection, please fill out all required fields of the test requisition form such as the following:
- First Name
- Family Name
- Date of Birth
- Gender
- Patient Height and Weight
- Date of Collection
- Time of Collection
- Clinical Notes
- Indicate billing information: Insurance or Client billed

Locate the test you would like to order in the lists. If you cannot find the test you are looking for, please list it in the “Additional Tests & Sample Types” field on the bottom of the form. Mention the test code number along with the test order name to ensure that the correct test will be ordered.
Introduction to Specimen Collection

Laboratory tests results contribute relevant information about a patient’s health. Correct diagnosis relies on the accuracy of test results. Correct and adequate patient preparation, specimen collection, and specimen handling are essential prerequisites for accurate test results. The accuracy of test results is dependent on the integrity of specimens.

General Specimen Collection

It is important to look up the cause for rejection before the specimen reaches National Reference Laboratory. Cause for rejection can be found on the NRL website: [https://www.nrl.ae/en/tests.html](https://www.nrl.ae/en/tests.html)

Below are some the common considerations affecting all types of specimen include:

1. Failure to label the specimens correctly and incorrect patient demographics on the request form
2. Quantity of specimen not sufficient to perform a test
3. Failure to maintain appropriate sample storage temperature.
4. Failure to use the correct collection tube or containers.
5. Specimen leakage and contamination
6. Hemolysed samples
7. Citrate tubes overfilled or under filled
8. Samples collected using capillary tubes
9. Specimen collected on expired containers
10. Specimens received with needles attached

Note: Specimen collection supplies such as blood collection tubes and collection devices (e.g. heel lancets, culture swabs, and transport media) must be used within their expiration date and stored per manufacturer’s instructions.

Specimen Labeling

To protect patients from adverse errors made due to improperly labeled specimens, the laboratory policy demands that proper labeling criteria are always met. Every specimen brought to the laboratory must have a label on the container in which it is held. It is not acceptable to label only the lid, transport bag, or other container used to transport the specimen. The label must contain the following legible information:

- Patient name
- Patient medical record number
- Patient Date of Birth
- Specimen Source
Labeling Steps

- Place label directly under the tube cap
- Patient name should be at the top of the tube
- Place the barcode straight along the length of the tube
- Place label on top of the manufacturer label
- Leave visible window to see blood sample
- Place one label on each tube

Specimens must be accompanied with a test requisition form or electronic requisition form that must match the specimen label.
Specimens must be submitted in the correct tube type or appropriate transport material in a leak-proof container.

All patient specimens MUST be placed in biohazard bags for transport to the Laboratory.

Incorrect Labeling

- Label not placed at the top of the tube
- Blood level not visible.
- Barcode is wrinkled.
- Barcode twisted.
- Barcode is horizontal.
- Label is upside down. Name is at the bottom of the tube, not under the cap.
- Writing is not in designated area and is on top of bar code.
Patient Identification

Patient identification is extremely important in blood sampling. According to CAP guidelines, a minimum of two legible identifiers on the tube is required, which match the request form. The individual collecting the specimen positively identifies the patient before collecting a specimen and labels the specimen in the presence of the patient.

There needs to be at least two of the following identifiers on the barcode.

- Patient Medical Record Number
- First Name
- Family Name
- Barcode number found on the request form

Minimum Volumes

One of the most common problems in specimen collection is the submission of insufficient specimens.

To ensure adequate specimen volume:

- Always draw the whole blood in an amount 2 and half times the required volume of serum required for a particular test.
- If pediatric tubes are used, be sure to collect and adequate volume of specimen to perform the test.
- It is critical, especially for any specimen collection tube containing an additive to allow the tube to fill completely with specimen. This requirement is important in order to achieve the proper blood-to-additive ratio; otherwise the specimen may be found tube insufficient

Hemolysed Specimens

In general, grossly or even moderately hemolysed blood specimens may not be acceptable for testing. Hemolysis occurs when the red cells rupture and hemoglobin and other intracellular components spill into the serum.

Tips on Avoiding Hemolysis

- Do not centrifuge the specimen before it has clotted
- Do not expose the whole blood to extreme temperature (hot and cold)
- Try to avoid a traumatic venipuncture
- Do not vigorously shake whole blood
- Do not prolong tourniquet application longer than necessary
There should be a proper angle of the needle to the vein to avoid transfixation.
Allow the site to dry first after sterilization
Do not collect the specimen in a hematoma
Do not centrifuge the specimen for a prolonged period of time

Factors affecting the performance of examination

- Anticoagulant therapy – Coagulation testing (PT and PTT)
- Stress
- Exercise
- Diet
- Medication
- Surgery

Multiple-specimen Testing

- This test is a series panel that requires multiple tubes to be drawn at multiple time points
- This panel is used to collect an initial tube (baseline) and then treat the patient with a drug or other treatment and then collect more tubes after the dose.
- All specimens must be clearly labeled with the patient’s name and the date and time of collection. Multiple-specimen labels or sequence can be obtained from NRL.
- Sequence labels will be applies at the top of the specimen tube, just below the tube’s top or cap.
• Only one test request form accompanies the specimens; do NOT submit a separate test request form for each specimen.
• The test request form must have the patient information, including any medication administered and the number of specimens submitted.
• The test request form and all specimens should be submitted in one plastic specimen transport bag.

Patient Instructions: 24 Hour Urine Collection

To ensure accurate test results below are instructions for collection. Some 24 hour urine tests require an additive in the container. Consult your physician prior to the test to make sure you have the correct container.

Collecting the specimen:

• Decide a time to start the test (e.g. 8am)
• Label the container with your full name, date of birth and the date and time you start the collection
• Empty your bladder at this time and discard the first urine.
• All urine in the next 24 hours should be collected in a container (such as a clean ice cream container) and must be transferred to the large bottle.
• Keep the container in a cool place (do not refrigerate) in an upright position with the lid firmly secured at all times.
• After 24 hours from the initial collection (e.g. 8am the next morning) empty your bladder and place this urine into the container.
• Indicate the date and time of start and end of collection on the container.

For 24 hour Creatinine Clearance: This test is used to measure kidney function and requires a blood test to be taken within 48 hours of the urine being collected. It is preferable to have the blood test when you deliver the completed urine specimen.

Patient Instructions: Fecal Collection

• Label the container with your First Name, Family Name, Date of Birth, Date of Collection and Time of Collection.
• Ensure there is no urine which comes into contact with the feces sample.
• Pass urine into the toilet first if necessary and place a clean plastic container into the toilet bowl to catch the feces.
• Using the scoop inside the lid of the jar, collect the feces and place into the jar, then secure the lid tightly.
• Submit the container with sample as soon as possible.
• If you have a second jar with liquid in it, unscrew the lid, remove the small stick attached to the inside and dip into the feces. Collect enough to fill the line on the side of the jar. Place the Stick back into the fluid-filled jar, tighten the lid and gently shake 5 times.
• For Ova & Parasite collection use O & P transport container with formalin and PVA (Para-Pak® pink and gray).
Patient Instructions: Fasting Instructions

- Ensure no food or drink intake for 8-10 hours before the blood collection.
- Avoid smoking.
- The most common fasting method is to fast during night and have the blood test first thing in the morning.
- If patient is diabetic or on medication, consult the physician before fasting.

Patient Instructions: Midstream Urine Collection

The aim is to get a specimen (sample) of urine from the middle of your bladder. Urine is normally sterile (no bacteria present). If bacteria are found in the sample, it means that the urine is infected.

A midstream sample is best as the first bit of urine that you pass may be contaminated with bacteria from the skin. A urine bottle will be provided by a doctor or a nurse.

Prior to collecting the midstream urine specimen:

- Wash your hands and genitals.
- Do not open the sterile bottle until you are ready to take the sample.
- Avoid touching any part of your genitals with the bottle, as this may cause contamination.
- Pass some urine into the toilet. Without stopping the flow of urine, catch some urine in the sterile bottle up to the indicated mark (the attending nurse will mark the urine bottle).
- Finish off passing the rest of your urine into toilet.
- If there is not enough urine collected any amount is better than none.
- Put the cap back on the container when you are finished.

Patient Instructions: Sputum Collection

Your physician has ordered a sputum sample for testing. To ensure accurate results, please follow the below instructions carefully.

Before collection, brush your teeth, rinse your mouth well and gargle with water to reduce contamination with food particles.
For microbiology routine culture: Collect 1 sample

- Label the sputum jar with your first name, family name, date of birth, time of collection and date of collection.
- Sputum should be produced from the base of the lungs, usually through a deep cough. It is important to note that Sputum is usually white, yellow or green in color. Saliva, in contrast, is often clear and colorless. Saliva is not acceptable in this test and will result in a re-collection if submitted.
- Spit the sputum directly into the jar provided.
- It is sometimes easier to perform this first thing in the morning.
- Close the lid tightly and submit to the laboratory.

For mycobacterium culture: Collect 3 samples- 1 sample per day, for 3 days

- Collect 3 jars from your physician. These jars might have preservative liquid inside.
- Label the sputum jars with your first name, family name, date of birth, time of collection and date of collection.
- Sputum should be produced from the base of the lungs, usually through a deep cough. It is important to note that Sputum is usually white, yellow or green in color. Saliva, in contrast, is often clear and colorless. Saliva is not acceptable in this test and will result in a re-collection if submitted.
- Spit the sputum directly into the jar.
- Close the lid tightly and return all 3 jars to your physician.

Communicating, handling, and transporting of samples from suspected or known “High Risk” samples or Extremely Dangerous Pathogens.

Proper Communication, handling, and transporting of samples from suspected or known “high risk” Samples or Extremely Dangerous Pathogens.

- All suspected or confirmed cases of Extremely Dangerous samples are considered high risk.
- Clients must notify NRL technical support (TS) prior to specimen pick-up for such suspected and/or confirmed samples.
- NRL TS will review and if appropriate approve client’s request. Clients should not send any “high risk” samples prior to NRL TS written approval.
- Identified samples must be packed in a triple pack biohazard bag and labelled as “highly infectious specimen”.
- NRL technical support team will inform the NRL Quality Assurance department, Technical Operations and the NRL logistics team regarding the concerned highly infectious samples.
- Please keep the samples in a separate box and at the appropriate storage temperature.
- Please inform the Agility representative during the sample pick up process about the highly infectious sample.
Specimen Collection and Transportation Instruction for Anatomic Pathology

1 Patient Preparation
   1.1 Physician has to give the patient a brief description of the laboratory test(s) ordered.
   1.2 Call the NRL Customer Care Team ‘800-675’ for further information required on patient preparation if required.

2 Requisitions
   2.1 All tests must be requested by manual request form signed by the ordering physician in compliance with local and international regulations.
   2.2 In general, the request must be completed with the following information:
      2.2.1 Patient’s Information: Patient’s full name, first, middle and last name, MRN number, Date of birth, Patient’s gender, Nationality, Ward or Clinic, relevant Clinical Data.
      2.2.2 Requesting Physician Information: Name, Stamp, Signature, and Contact Number.
   2.3 Assign Test Priority
      2.3.1 There are two test priorities available – Routine/Urgent.
      2.3.2 Choose the turnaround time of your request, by default any request is considered routine.

3 General precautions
   3.1 Note any patient isolation/precautions and follow universal standard precautions procedures.
   3.2 Ensure that appropriate protective clothing is worn and appropriate identification is visible.

4 General Procedure
   4.1 Identify the patient positively by asking the patient’s full name and checking the hospital number.
   4.2 Provide the patient with the special instructions sheet (when applicable)
   4.3 Explain the procedure to the patient.
   4.4 Do not discuss test results or anything about the test other than the procedure.

5 Gyne Specimen Collection
   5.1 Test indication:
      5.1.1 The ThinPrep liquid-based Pap test produces slides that are intended as replacements for conventional gynecologic smears.
      5.1.2 The Pap smear is used in the screening and detection of cervical cancer, precancerous lesions, atypical cells and all other cytologic categories as defined by the Bethesda System for Reporting Cervical Cytology.
   5.2 Collection kit:
      5.2.1 This test requires a ThinPrep™ special Gyn collection kit, which includes;
5.2.1.1 ThinPrep preservative fluid collection vial
5.2.1.2 Sampling device: Cervex-Brush with detachable head.

5.3 Collection procedure:

5.3.1 Obtain cervical specimen prior to bimanual examination. Use an un lubricated speculum (saline or warm water may be used).
5.3.2 Vaginal discharge or secretion, when present in large amounts, should be removed before obtaining the cervical sample so as not to disturb the epithelium (e.g. cellulose swab).
5.3.3 Small amounts of blood will not interfere with the cytologic evaluation; however, large amounts of blood as present during menses may interfere with cytologic evaluation (cervical cell sampling for cytology is recommended at the woman’s mid-cycle) because cells may be obscured by blood. Use of liquid-based specimen collection minimizes the interference from these factors.

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**Obtain...**

...an adequate sampling from the ectocervix using a plastic spatula. If desired, use lukewarm water to warm and lubricate the speculum. Water-soluble gel lubricant sparingly applied to the posterior blade of the speculum can be used if necessary. Select contoured end of plastic spatula and rotate it 360 degrees around the entire exocervix while maintaining tight contact with exocervical surface.
5.3.5

Rinse...
...the spatula as quickly as possible into the PreservCyt solution vial by swirling the spatula vigorously in the vial 10 times. Discard the spatula.

5.3.6

Obtain...
...an adequate sampling from the endocervix using an endocervical brush device. Insert the brush into the cervix until only the bottommost fibers are exposed. Slowly rotate 1/4 or 1/2 turn in one direction. DO NOT OVER-ROTATE.

5.3.7

Rinse...
...the brush as quickly as possible in the PreservCyt solution by rotating the device in the solution 10 times while pushing against the PreservCyt vial wall. Swirl the brush vigorously to further release material. Discard the brush.
5.3.8

_Tighten..._
...the cap so that the torque line on the cap passes the torque line on the vial.

5.3.9

_Record..._
...the patient's name and ID number on the vial, and the patient information and medical history on the cytology requisition form.

5.3.10

_Place..._
...the vial and requisition in a specimen bag for transport to the laboratory.

5.4 **Collection Notes**

5.4.1 There should NOT be any brush head in the ThinPrep vials received in the laboratory.
5.4.2 Failure to follow recommended procedures for ThinPrep collection may compromise performance.

5.5 **Collection Precautions**

5.5.1 Good laboratory practices and procedures for use of the ThinPrep Pap test System should be strictly observed.
5.5.2 Avoid splashing or generating aerosols. Operators should use appropriate hand, eye and clothing protection.
5.5.3 ThinPrep Preservcyte fluid was tested for antimicrobial effectiveness against *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Candida albicans*, *Mycobacterium tuberculosis* and *Aspergillus niger* and found to be effective. The Preservcyte fluid is methanol based, hazardous & flammable reagent, follow precautions as per MSDS sheet.

5.5.4 Universal precautions for safe handling of biological fluids should be practiced at all times.

6 Non-Gyne Specimen Collection

6.1 Test indication

6.1.1 Cytologic examination of fluid from pleural, peritoneal and pericardial body cavities as well as all Urine’s, Bronchial washings and bladder washings is of great diagnostic value in non-neoplastic and neoplastic lesions.

6.2 Specimen Collection & Ordering

6.2.1 For single specimen collections, only ‘one’ order is required to be placed by the Physician.

6.2.2 For multiple specimens of the same patient, but different sites, an order for ‘each’ specimen must be requested and labeled with the corresponding ordered accession patient sticker.

6.2.3 This is important to ensure the clinical information entered by the Physician for each specimen is viewable to the reporting Pathologist.

6.3 Fluids

6.3.1 Fluids must be place in a sterile specimen container with a screw cap. Make sure the cap is tight to prevent any leakage when transported.

6.3.2 Ensure containers are leak proof and correctly sealed.

6.3.3 When syringes are used to obtain a Cytopathologic specimen, needles must be removed and replaced with syringe caps.

6.3.4 As much fluid, urine, washing as possible must be sent – fill specimen collection bottle where possible – But NOT overfill to cause spillage.

6.3.5 Print patient accession sticker and label specimen.

6.3.6 Place the specimen container in a biohazard specimen bag for transport to the laboratory.

6.3.7 Specimens should be transported STAT to ensure specimen integrity is not compromised.

6.3.8 All specimens collected after working hours should be sent to “AUH core lab laboratory Reception” as soon as possible where it must be stored in the fridge until transport to LCA. Refer to NRL-AGL-MOP-001 (Specimen logistics Operations).

6.4 Brushings

6.4.1 ‘x2 – 4’ clean microscopic super frosted slides should be prepared prior to taking the sample.

6.4.2 A specimen container/coplin jar should be filled with 95% alcohol, or if spray fixative is being used, make sure the cap of the spray fix can is removed and that the can contains sufficient reagent by priming it with a quick “test spray” (beware, reagent is flammable) and placed with the slide on a clean working surface.

6.4.3 Write the Patient’s name and ID.nr using a lead pencil (ink pen should not be used, as the ink will be washed off during processing) on the frosted area at the top of the slide.
6.4.4 After the sample is obtained from the patient, the brush is then immediately and gently (to prevent crushing the cells) rolled/smearred on the glass slide.

6.4.5 The slides are immersed immediately in the 95% alcohol for fixation, or if using spray fixation, by keeping the slide at 5-10 inches from the stream of spray (spraying at a distance too close to the slide will blow the cells from the slide, and a distance too far away from the slide will not ensure proper optimal cell fixation) allowing a steady stream of spray for a couple of seconds evenly spread over the smeared slide.

6.4.6 **The immediate fixation of slides cannot be overemphasized because cells are few and thinly spread and will dry out very quickly on the slide which will create an air-dried artifact and the cells cannot be examined and a diagnosis made.**

6.4.7 The rolling/smearing process is repeated on more slides.

6.4.8 x1 slide can be left to air-dry for a Romanowsky-type stain to be done on it.

6.4.9 The brush can then be put in specimen container containing saline.

6.4.10 Label container with Patient sticker including all relevant information.

6.4.11 Specimen must be placed in a sealed biohazard bags prior to transportation.

6.4.12 All specimens must be accompanied by a patient sticker with the accession number.

6.4.13 Specimens should be transported STAT to ensure specimen integrity is not compromised.

6.4.14 All specimens collected after working hours should be sent to “AUH core lab laboratory Reception” as soon as possible where it must be stored in the fridge until transport to LCA. Refer to NRL-AGL-MOP-001 (Specimen logistics Operations).

6.5 Fine Needle Aspiration (FNA) Collection:

6.5.1 A minimum of 6 clean, dry super frosted slides should be prepared before the procedure (more slides can be used if necessary, but at least two (2) slides should be left to air dry.) Prepare a sufficient number of slides clean, dry microscope slides. In general, it is recommended to prepare at least two smears from each needle pass. One of the prepared smears should be fixed in 95% alcohol, OR spray fixed. The other slide should be air dried. If the obtained sample volume allows, additional smears may be prepared.

6.5.2 Place the slides on a clean, dry surface (clean paper towel) with the frosted side of the slide facing up.

6.5.3 Write with a pencil (ink pen should not be used) the name and patient’s ID nr on the frosted part at the top of the slide.

6.5.4 Fill a ‘slide holder’ or specimen container with 95% alcohol, or if using spray fixative, keep the spray can primed, with cap removed within easy reach. Slides sent to us in plastic slide carriers without alcohol (slides fixed in 95% alcohol for 20 minutes, then removed from the alcohol, let dry before placing slides in the carrier for dispatch.

6.5.5 A sticker with the patient’s information is stuck on the jar/container/slide holder.

6.5.6 A second slide holder is also prepared for the air dry slides with the patient’s information on the slide holder.

6.5.7 **If more than one FNA is done on the same patient;** (eg. Left & Right Breast), follow the same procedure in preparing the slides and write the name and patient’s ID nr on every slide.

6.5.8 Write Lt Breast on the slides used for the Left Breast aspiration, and Rt Breast on the slides used for the Right Breast aspiration.

6.5.9 Two different slide holders (coplin jars) should also be prepared – one for the right breast and one for the left breast.

6.5.10 A sticker with the patient’s information is stuck on the jars/containers and LEFT BREAST must be written on the one sticker on the one container and RIGHT BREAST on the other sticker (second container).

6.5.11 Make sure that the correct slides go in the correct container – left breast slides in the left breast container and vice-versa.

6.5.12 The consultant/Physician can then commence with taking the FNA sample.
6.6 Performing the Fine Needle Aspiration and smear preparation

6.6.1 Fix the swelling with one hand and then insert the needle.
6.6.2 Move the needle in the swelling in different directions. This step should not take too long, as the sample may clot in the needle/or syringe, preventing proper retrieval and spreading of the sample.
6.6.3 After withdrawing the needle if attached to a syringe (the negative pressure in the needle must be released BEFORE withdrawing it, otherwise the sample will be sucked in to the syringe and lost for retrieval), after withdrawing the needle/syringe the syringe is removed from the needle and filled with air to serve as an expressive force when reconnected to the needle. If only a needle without attached syringe is used to obtain the Fine Needle Aspiration, a syringe is attached to the needle before expelling the sample to the slide.
6.6.4 Cells obtained from the aspiration (small droplet) are expressed onto the labeled glass slides by placing the needle, bevel side down, in contact with the glass, and expressing a droplet.
6.6.5 Utilizing a second glass slide, the droplet is dispersed by surface tension (placing the two slides on top of each other – right (i.e. frosted sides of the slides facing each other). The slides are then separated in a quick, gentle perpendicular fashion, without applying any pressure.
7 Surgical Pathology Specimen Collection

7.1 Test indication:

7.1.1 Surgical Pathology examination is the microscopic study of the cell structure of tissues and organs.

7.2 Specimen Collection:

7.2.1 Prior to or during patient preparation, the Nursing staff or Physician must arrange a clean and suitably sized container, ready for excision of the histology sample.

7.2.2 Ensure containers are leak proof and correctly sealed.

7.2.3 Nursing Staff must fill the appropriate sized container with 10% neutral buffered formalin to ensure immediate fixation of the specimen.

7.2.4 Appropriate volume of fixative inside the container MUST be 15 – 20 times the volume of specimen.

7.2.5 After collection of surgical specimen, gently place the specimen inside the container to prevent splashing of the formalin solution, and close lid securely to prevent spillage during transportation.

7.2.6 Clearly label with Patient Sticker which includes Name, Medical Record Number, Date and time of procedure, Specimen type, Specimen number if multiple (i.e. A,B,C etc...).

7.2.7 Specimen must be placed in a sealed biohazard bag prior to transportation.

7.2.8 All specimens must be labeled and accompanied by a patient sticker with the accession number.

8 Specimen Labeling/Preparation

8.1 Specimen must be collected and handled properly so that the compositions or substances of interest remain in good condition for laboratory analysis.

In general note the followings:

8.1.1 Follow standard infection control precautions when handling specimens such as appropriate protective clothing is used and proper disposal of sharps. Perform hand hygiene and wear gloves.

8.1.2 Affix the label without covering the contents of the container.

8.1.3 Write on the sticker the date and time of collection and source of the specimen.

8.1.4 Collect fresh materials as free from extraneous contamination as possible.

8.1.5 Do not overfill and secure lids immediately and properly, to avoid spillage and contamination during transport, which can affect patient sticker details and identification.

9 Specimen Delivery / Transportation

9.1 Safety is of utmost importance. All specimens/biological substances should be treated as potentially infectious.

9.2 Place specimen container in leak proof biohazard bags.

9.3 Place requisition form in the outside pocket of the bag.

9.4 Place the biohazard bag in leak proof container that has a handle and a tight fitting lid.
9.5 Larger specimens/containers shall be placed in a large RED Biohazard bag, which are tied at the neck. The patient sticker shall be attached to the outside bag as well.

9.6 Follow any special instructions for particular tests like using ice pack for fresh tissue or fluids, but without contaminating the sample with the ice.

9.7 Do not send patient to deliver specimen to laboratory.

9.8 Give clear instructions to transport the specimen directly to the Anatomic Pathology laboratory reception.

9.9 Always remove the needle attached to specimens before specimen pick up for transport.

9.10 Samples brought by courier service must be logged into the log book at the laboratory entrance. These documents the time of delivery and specimen tracking.

9 Specimen Rejection Criteria

10.1 No Anatomic Pathology specimen is rejected.

10.2 If there are any discrepancies, the specimen is ‘partially rejected’ and held by the AP laboratory until the discrepancy is fully resolved and then commences processing.

11 Resolution of Specimen Discrepancy

11.1 If a problem is identified in specimen transportation or quality, notify the Section Supervisor of the laboratory.

11.2 It is the responsibility of the Section Chief or Supervisor to attempt to improve performance of clients that frequently submit specimens improperly. Problems and corrective actions will be documented in the Quality Improvement RIQ report.

11.3 The following circumstances under which correction of the information on specimen labels are permitted, provided the client has signed an ‘Specimen Identification Problem’ (SIP) and the circumstance is reviewed and approved by the AP Director at the time of correction or before the patient’s report is issued and if the specimens is impossible or difficult to recollect, include:

11.3.1 Cerebrospinal fluid
11.3.2 Bone marrow aspirate
11.3.3 Radiological guided FNA (deep FNA)
11.3.4 Brain biopsy or other surgical specimens
11.3.5 Any anatomic pathology specimen that cannot be recollected (e.g. resections, mastectomy, etc.)
11.3.6 Anatomic pathology specimens requiring correction of information not related to the patient’s identity (e.g. date or time of collection, nurse's initials, description of anatomic site, specimen source, etc.)
11.3.7 Specimen slide label information that can be corrected based on written information located under the label
11.3.8 Broken slides that can be repaired
11.3.9 Irreplaceable specimen - a specimen that is difficult to collect (invasive and/or surgically removed) and cannot be replaced by a repeat specimen, such as a lymph node or spleen.
11.3.10 If it is possible for a clinician or nurse to personally identify the specimen they may re-label it.
11.3.11 A record of all such corrections will be maintained within the Section, including the name and title of the person that corrected the patient identification or other information in the RIQ folder with the attached SIP form when applicable.

Quantiferon TB Gold Plus Collection & Processing Guidelines
Option 1: Quantiferon TB Gold Client Incubated

- Incubate samples after blood collection, standing upright at 37°C for 16-24 hours

  **Note:** If tubes are not incubated after collection, re-shake the kit immediately prior to incubation

- Label QFT kit as “Incubated”. Indicate on the request form the following
  - Date and time of sample collection
  - Date and time of incubation

- Ship the unspun incubated QFT kit to the laboratory at 4-27°C within 3 days (72 hours).

- For centrifuged samples, samples can be stored for 4 weeks at 2 - 8°C.

  **Note:** Client may opt to centrifuge if unable to meet the 72 hour stability. Contact Microbiology department to confirm centrifugation procedure

- Indicate “Client incubated” on the request form.

Option 2: Quantiferon TB Gold Plus In-Tube (NRL Incubated)

- Notify NRL of sample pick-up immediately after blood collection

  **Note:** Specimen should be received within 16 hours of collection to NRL.

- Indicate on the request form the date and time of sample collection

Quantiferon TB Gold Plus – Centrifugation Procedure

- After incubation, centrifuge tubes for 15 minutes at 2000 to 3000 rcf (g). The gel plug will separate the cells from the plasma. If this does not occur, the tubes should be centrifuged again.
- Plasma samples should only be harvested using a pipet.
- After centrifugation, avoid pipetting up and down or mixing plasma by any means prior to harvesting. At all times, take care not to disturb material on the surface of the gel.
- Transfer the harvested plasma into screw capped tubes and label accordingly (NIL, TB1, TB2, Mitogen)
- Plasma samples can be stored up to 28 days at 2–8°C. For adequate test samples, harvest at least 150 uL of plasma.
Helicobacter pylori Urea Breath Test

The patient’s name and identification number should be clearly written on the balloon. Do not affix any labels on the balloon. Patient identity labels are to be affixed onto the envelope.

Patient Preparation

- Patient should be fasting for 4 hours prior to this test, and should continue to fast during the 30 minutes wait period

Collection Procedure

- Collect the 1st breath sample into one of the collection bag as follows:
  - Write patient’s ID, date and time and remarks into the reserved areas printed on the bag or affix tour barcode
  - Remove the cap from the bag and insert the mouth piece (straw)
  - Have the patient take a normal breath, hold it for 8 to 12 seconds, then exhale as much as possible through the straw into the bag.
  - Open the BreathCard™ envelope and take out the BreathCard™.
  - Instruct the patient to exhale softly through the BreathCard™ must continue until the indicator membrane changes from orange to yellow. This usually takes 2-4 minutes.

- Prepare the urea solution by adding room temperature drinking water to the “Fill to” line on the plastic container (about 75 mL). Replace lid on the container and mix by shaking vigorously until completely dissolved. Have the patient slowly drink the solution. Start timing the patient once the solution has been consumed.
- 20 to 30 minutes after drinking the solution, collect the second breath sample from the patient into the second collection bag following the same directions as for the initial sample. Make sure by proper marking

BacT/ALERT® Blood Culture Collection Procedure

- Skin Preparation
  - After location of the vein, vigorously scrub the venipuncture site with PDI® Chlorascrub Swabstick for 30 seconds.
  - Allow the site to air dry before venipuncture
  - Do not re-palpate the vein

- Bottle Preparation
- Inspect each blood culture bottle before use to ensure integrity of bottle and sensor on bottom of the bottle is intact. The sensor is normally a uniform grayish-green color and a yellow color would indicate contamination of the broth. Discard any bottle found to be damaged or with a sensor that is yellow.
- Remove protective flip top overcap
- Note: The septum is not sterile and must be disinfected.
- Cleanse the septum with 70% alcohol
- The bottle has been pre-marked with 5ml increments. Mark the desired fill volume on the bottle for 10 ml

- Venipuncture and Bottle Inoculation
Coagulation Specimen Collection Procedure

- Collection of blood for coagulation testing through intravenous lines that have been previously flushed with heparin should be avoided, if possible.
- If the blood must be drawn through an indwelling catheter, possible heparin contamination and specimen dilution should be considered.
- When obtaining specimens from indwelling lines that may contain heparin, the line should be flushed with 5 mL of saline and the first 5 mL of blood or 6-times the line volume (dead space volume of the catheter) be drawn off and discarded before the coagulation tube is filled.
- For those samples collected from a normal saline lock (capped off venous port) twice the dead space volume of the catheter and extension set should be discarded.

2019 Novel Coronavirus (2019 nCOV) Specimen Collection

SAFETY PROCEDURES DURING SPECIMEN COLLECTION

- Ensure that adequate SOPs are in use and that staff are trained for appropriate specimen collection, storage, packaging and transport. All specimens collected for laboratory investigations should be regarded as potentially infectious. Ensure that health care workers who collect specimens adhere rigorously to infection prevention and control guidelines.

  Note: at NRL Owned Laboratories and NRL Managed laboratories; no technologist or pathologist is authorized to collect specimens (NP, OP, etc.) from patients.

- All specimens collected for laboratory investigations should be regarded as potentially infectious. HCWs who collect, handle or transport any clinical specimens should adhere rigorously to the following standard precaution measures and biosafety practices to minimize the possibility of exposure to pathogens.
- Ensure that HCWs who collect specimens use appropriate PPE (i.e., eye protection, a medical mask, a long-sleeved gown, gloves). If the specimen is collected with an aerosol-generating procedure, personnel should wear a particulate respirator at least as protective as a NIOSH-certified N95, an EU standard FFP2, or the equivalent;
- Ensure that cleaning and disinfection procedures are followed consistently and correctly. Cleaning environmental surfaces with water and detergent and applying commonly used hospital disinfectants (such as sodium hypochlorite) is an effective and sufficient procedure. Manage laundry, food service utensils and medical waste in accordance with safe routine procedures.

SPECIMENS TO BE COLLECTED
At minimum, respiratory material should be collected:

- Upper respiratory specimens: nasopharyngeal and oropharyngeal swab or wash in ambulatory patients and/or
- Lower respiratory specimens: sputum (if produced) and/or endotracheal aspirate or bronchoalveolar lavage in patients with more severe respiratory disease. (Note high risk of aerosolization; adhere strictly to infection prevention and control procedures).

Additional clinical specimens may be collected as COVID-19 virus has been detected in blood and stool, as had the coronaviruses responsible for SARS and MERS (14,16,19-21). The duration and frequency of shedding of COVID-19 virus in stool and potentially in urine is unknown. In surviving patients, paired serum (acute and convalescent) can be useful to retrospectively define cases as serological assays become available.

<table>
<thead>
<tr>
<th>Status of specimen</th>
<th>Test</th>
<th>Type of sample</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient</td>
<td>NAAT</td>
<td>*Lower respiratory tract</td>
<td>Collect on presentation. Possibly repeated sampling to monitor clearance. Further research needed to determine effectiveness and reliability of repeated sampling.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- sputum</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- aspirate</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- lavage</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Upper respiratory tract</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- nasopharyngeal and</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- oropharyngeal swabs</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- nasopharyngeal wash/nasopharyngeal aspirate</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>*Consider stools, whole blood, urine</td>
<td></td>
</tr>
<tr>
<td>Patient</td>
<td>*Serology</td>
<td>*Serum for serological testing once validated and available</td>
<td>Paired samples are necessary for confirmation with the initial sample collected in the first week of illness and the second ideally collected 2-4 weeks later (optimal timing for convalescent sample needs to be established).</td>
</tr>
<tr>
<td>Contact</td>
<td>NAAT</td>
<td>Serology</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>------</td>
<td>----------</td>
<td></td>
</tr>
<tr>
<td>in health-care centre associated outbreaks or other settings where contacts have symptoms, or where asymptomatic contacts have had high-intensity contact with a COVID-19 case.</td>
<td>Nasopharyngeal and oropharyngeal swabs</td>
<td>*Serum for serological testing once validated and available</td>
<td></td>
</tr>
<tr>
<td>Within incubation period of last documented contact.</td>
<td></td>
<td>Baseline serum taken as early as possible within incubation period of contact and convalescent serum taken 2-4 weeks after last contact (optimal timing for convalescent sample needs to be established).</td>
<td></td>
</tr>
</tbody>
</table>

*Call NRL Scientific team prior to this type of specimen acceptance and or confirmation to clients.
SPECIMEN COLLECTION INSTRUCTIONS

NASOPHARYNGEAL SPECIMEN

Arrange all the necessary supplies needed for specimen collection;
- PPEs
- NP Swab
- Universal Transport Media (UTM)
- Specimen labels
- Biohazard bag

Note: if the patient has a lot of mucous in the nose, which can interfere with collection. Instruct the patient to use a tissue to gently clean the nasal passage before the specimen collection procedure.

1. Use the flexible shaft NP swab provided to collect the specimen;
2. Hold the swab with fingers placed on the score line;
3. With the patient seated; tilt the patient’s head back 70 degrees, support the back of their head with your non-dominant hand;
4. Gently insert the NP dry flocked swab into nostril parallel to the palate (not upwards) until resistance is encountered or the distance is equivalent to that from nostrils to outer opening of patient’s ear indicating contact with nasopharynx;
5. Rotate the swab several times while the swab is in contact with the nasopharyngeal wall;
6. Slowly remove the swab while rotating it;
7. Insert the swab into the tube of UTM;
8. Making certain that the swab tip is covered by the liquid in the tube. The swab is to remain in the tube for transport;
9. Plastic shaft NP swab: The swab shaft extends past the top of the tube. Snap it off at the break line on the shaft, allowing the end with the swab tip to remain in the liquid. The tip of the swab must be immersed in the liquid;
10. Replace cap and screw cap on securely;
11. Label the sample and place in biohazard bag.
THROAT SPECIMEN (OROPHARYNGEAL SWAB [OP]):

Arrange all the necessary supplies needed for specimen collection;

- PPEs
- OP Swab
- Universal Transport Media (UTM)
- Specimen labels
- Biohazard bag

1. Use the rigid shaft swab provided to collect a specimen;
2. Hold the swab with fingers placed on the score line;
3. Gently insert swab into back of the throat and tonsillar area;
4. Rub the swab by swabbing the patient’s both tonsillar pillars and the posterior oropharynx and avoid touching the tongue teeth and gums.
5. Insert the swab into the tube of UTM;
6. Making certain that the swab tip is covered by the liquid in the tube. The swab is to remain in the tube for transport;
7. The swab shaft extends past the top of the tube. Snap it off at the break line on the shaft, allowing the end with the swab tip to remain in the liquid.
   The tip of the swab must be immersed in the liquid;
8. Replace cap and screw cap on securely;
9. Label the sample and place in biohazard bag.
Note: cotton or calcium alginate tipped, or wooden shaft swabs are unacceptable

**SPECIMEN STORAGE AND STABILITY**

Specimens for virus detection should reach NRL ICAD as soon as possible after collection.

Correct handling of specimens during transportation is essential. Specimens which can be delivered promptly to the laboratory can be stored and shipped at 2-8°C. When there is likely to be a delay in specimens reaching the laboratory, the use of viral transport medium is strongly recommended.

Specimens may be frozen to -20°C or ideally -70°C and shipped on dry ice if further delays are expected

It is important to avoid repeated freezing and thawing of specimens.

<table>
<thead>
<tr>
<th>Specimen type</th>
<th>Collection materials</th>
<th>Storage temperature until testing</th>
<th>Recommended temperature for shipment according to expected shipment time</th>
</tr>
</thead>
</table>
| Nasopharyngeal and oropharyngeal swab              | Dacron or polyester flocked swabs* | 2-8 °C                           | 2-8 °C if ≤ 5 days
-70 °C (dry ice) if > 5 days                         |
| *Bronchoalveolar lavage                            | Sterile container *           | 2-8 °C                           | 2-8 °C if ≤ 2 days
-70 °C (dry ice) if > 2 days                         |
<p>| *(Endo)tracheal aspirate,                          | Sterile container *           | 2-8 °C                           | 2-8 °C if ≤ 2 days                                                     |</p>
<table>
<thead>
<tr>
<th>Specimen Type</th>
<th>Transportation Requirements</th>
<th>Storage Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nasopharyngeal or nasal wash/aspirate</td>
<td>Sterile container with saline or VTM</td>
<td>2-8 °C if ≤ 24 hours, 70 °C (dry ice) if &gt; 24 hours</td>
</tr>
<tr>
<td>Sputum</td>
<td>Sterile container</td>
<td>2-8 °C if ≤ 2 days, 70 °C (dry ice) if &gt; 2 days</td>
</tr>
<tr>
<td>Tissue from biopsy From lung</td>
<td>Serum separator tubes (adults: collect 3-5 ml whole blood)</td>
<td>2-8 °C if ≤ 5 days, 70 °C (dry ice) if &gt; 5 days</td>
</tr>
<tr>
<td>Serum</td>
<td>Collection tube</td>
<td>2-8 °C if ≤ 5 days, 70 °C (dry ice) if &gt; 5 days</td>
</tr>
<tr>
<td>Whole blood</td>
<td>Stool container</td>
<td>2-8 °C if ≤ 5 days, 70 °C (dry ice) if &gt; 5 days</td>
</tr>
<tr>
<td>Stool</td>
<td>Urine collection Container</td>
<td>2-8 °C if ≤ 5 days, 70 °C (dry ice) if &gt; 5 days</td>
</tr>
</tbody>
</table>

*Note: *Call NRL Scientific team prior to this type of specimen acceptance and or confirmation to clients.

Transport of specimens should comply with applicable UAE national regulations.

International transport of potentially COVID-19 virus containing samples should follow the UN Model Regulations, and any other applicable regulations depending on the mode of transport being used.

**WITHIN NRL MANAGED LABORATORIES AND STAT LABORATORIES**

- The laboratory (Pathologist or Supervisor or Lab Manager) must be notified in advance by the responsible clinical/hospital caregiver that specimens from a suspected or known SARS-CoV-2 (COVID-19) patient are being sent. *(This applies only if the specimens are being send for the first time.)*
- The pathologist will guide caregivers about appropriate testing, alert laboratory staff and arrange the specimen collection requirements and referral to NRL ICAD.
- Testing for COVID-19 require clinical information and approval from NRL ICAD Lab.
- Only essential investigations should be sent to the laboratory until the diagnosis of COVID-19 is cleared.
- Use appropriate PPE (see appendix A) when collecting laboratory specimens e.g. gloves, mask, and gown. If possible, a designated assistant wearing PPE should be available to help.
- Once the specimens are labeled (Name, MRN, DOB) and checked for outside surface for any contamination, the specimens must be wrapped with an absorbent material (e.g. tissue paper)
• Place specimens for transport in leak-proof specimen bags (i.e., secondary containers) that have a separate sealable pocket for the specimen (i.e., a plastic biohazard specimen bag), and a clearly written laboratory request form. Preferably the biohazard bag labelled as “highly infectious specimen”. Responsibility for packing the sample as per the above requirement will be by the specimen collector.
• If there is any contamination outside the surface of the specimen container then it must be wiped with a disinfectant (e.g. 1:100 dilution of household bleach – hypochlorite). Re-label the specimen if the patient details become illegible.
• The packed Specimens are HAND DELIVERED immediately in a leak proof container (available from the laboratory) directly to Supervisor or Lab Manager in the pre analytical area of the laboratory. DO NOT SEND THROUGH THE PNEUMATIC TUBE SYSTEM.
• Ensure that all personnel who transport specimens are trained in safe handling practices and spill decontamination procedures.
• Document clearly each patient’s full name, date of birth and suspected nCoV of potential concern on the laboratory request form. Notify the laboratory as soon as possible that the specimen is being transported.

FROM CLIENTS – OUTSIDE NRL NETWORK

• NRL (NRL Technical support) must be notified in advance by the client representative prior to the scheduled/unscheduled specimen collection from a suspected or known SARS-CoV-2 (COVID-19) patient are being sent.
• NRL Technical Support (TS) will review and if appropriate approve client’s request. Clients should not send any suspected or known SARS-CoV-2 (COVID-19) samples prior to NRL TS written approval.
• NRL TS team will inform the NRL Quality Assurance department, Technical Operations and the NRL logistics team regarding the request for COVID-19 testing.
• NRL Operations will alert laboratory staff and arrange testing.
• If needed NRL Scientific team (pathologist) will guide the client caregivers about any other appropriate testing.
• Testing for COVID-19 viruses require clinical information and approval from NRL ICAD lab.
• Only essential investigations should be sent to the laboratory until the diagnosis of COVID-19 is cleared.
• Use appropriate PPE (see appendix A) when collecting laboratory specimens e.g. gloves, mask, and gown. If possible, a designated assistant wearing PPE should be available to help.
• Once the specimens are labeled (Name, MRN, DOB) and checked for outside surface for any contamination, the specimens must be wrapped with an absorbent material (e.g. tissue paper)
• Place specimens for transport in leak-proof specimen bags (i.e., secondary containers) that have a separate sealable pocket for the specimen (i.e., a plastic biohazard specimen bag), and a clearly written laboratory request form. Preferably the biohazard bag labelled as “highly infectious specimen”. Responsibility for packing the sample as per the above requirement will be by the specimen collector.
• If there is any contamination outside the surface of the specimen container then it must be wiped with a disinfectant (e.g. 1:100 dilution of household bleach – hypochlorite). Re-label the specimen if the patient details become illegible.
• Pack the samples in a separate box and at the appropriate storage temperature.
• Logistics team has to collect and transport the specimen in a sealed separate box. Don’t keep it along with the other specimens.
• Ensure proper temperature is maintained all the time during transportation.
SPECIMEN PACKAGING REQUIREMENTS

The package must include:

a) **Inner packaging**, comprising of:

- Leak proof primary receptacles (i.e., primary specimen tubes);
- Leak proof secondary packaging (i.e., plastic specimen bag);
- An absorbent material that can absorb the entire contents of all primary receptacles must be placed between the primary receptacle and secondary packaging. Absorbent material is not required for solid infectious substances. Paper towels are not to be used.
- If multiple fragile primary receptacles are placed in a single secondary packaging, they shall be either individually wrapped or separated so as to prevent contact between them. Glass primary specimen containers are fragile primary receptacles.
- Place specimens for transport in leak-proof specimen bags (i.e., secondary containers) that have a separate sealable pocket for the specimen (i.e., a plastic biohazard specimen bag), and a clearly written laboratory request form. Preferably the biohazard bag labelled as “highly infectious specimen”. Responsibility for packing the sample as per the above requirement will be by the specimen collector.

**Tube Guide**

<table>
<thead>
<tr>
<th>Top Colour</th>
<th>Tube Content</th>
<th>Common Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue</td>
<td>Sodium Citrate</td>
<td>All coagulation tests: Prothrombin (PT), APTT, Coagulation Profile (HEPTEX)</td>
</tr>
<tr>
<td>Red</td>
<td>Plain Tube</td>
<td>UFE/C, LFT, Thyroid, Lipids, CRP, Hormones, Fe Studies, Tumour Markers, Enzymes, Tropolon</td>
</tr>
<tr>
<td>Yellow</td>
<td>Gel</td>
<td>UFE/C, LFT, Thyroid, Lipids, CRP, Hormones, Fe Studies, Tumour Markers, Enzymes, Tropolon</td>
</tr>
<tr>
<td>Purple</td>
<td>EDTA</td>
<td>CBC, ESR, HbA1c, Red Cell Folate, Heavy Metal Screens, PCR tests</td>
</tr>
<tr>
<td>Grey</td>
<td>Fluoride Oxalate</td>
<td>Glucose, Lactate</td>
</tr>
<tr>
<td>Green</td>
<td>Lithium Heparin</td>
<td>Chromosomes, Lymphocyte Surface Markers</td>
</tr>
</tbody>
</table>
### Representative Blood Collection Tubes

<table>
<thead>
<tr>
<th>Application</th>
<th>Safety closure color</th>
<th>Conventional stopper color</th>
<th>Additive</th>
<th>Number of inversions to mix</th>
<th>Order of Draw</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood culture</td>
<td>Yellow</td>
<td>Yellow</td>
<td>Sodium polyanetholsulfonate (SPS)</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>Discard waste tube used prior to special coagulation tests and/or winged blood collection set</td>
<td>Clear or white</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>2</td>
</tr>
<tr>
<td>Plasma for coagulation tests</td>
<td>Light Blue</td>
<td>Light Blue</td>
<td>Buffered 3.2% sodium citrate</td>
<td>3 to 4</td>
<td>3</td>
</tr>
<tr>
<td>Erythrocyte Sedimentation</td>
<td>Black</td>
<td>Black</td>
<td>Buffered Citrate</td>
<td>8 to 10</td>
<td>3</td>
</tr>
<tr>
<td>Serum for chemistry, serology, blood bank tests</td>
<td>Red</td>
<td>Red</td>
<td>Clot activator</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Serum for chemistry tests</td>
<td>Gold or Red</td>
<td>Red</td>
<td>Clot activator and gel for serum separation</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Serum for stat chemistry tests</td>
<td>Orange</td>
<td>Orange or Red/ Yellow mottled</td>
<td>Thrombin clot activator</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Serum for trace element, toxicology and nutrition tests</td>
<td>Royal Blue (Red label)</td>
<td>Royal Blue</td>
<td>Clot activator</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Plasma for chemistry tests</td>
<td>Green</td>
<td>Green</td>
<td>Lithium or sodium heparin</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Plasma for chemistry tests</td>
<td>Light green</td>
<td>Green or Green/Gray mottled</td>
<td>Heparin and gel for plasma separation</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Whole blood hematology (CBC) immunohematology (ABO grouping, Rh typing, antibody screening) and chemistry testing (hemoglobin A1c)</td>
<td>Lavender</td>
<td>Lavender</td>
<td>Dipotassium or tripotassium EDTA</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Molecular viral load, blood bank, hematology testing</td>
<td>Pink</td>
<td>Pink</td>
<td>Dipotassium EDTA</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Plasma for molecular testing</td>
<td>White</td>
<td>None</td>
<td>Dipotassium EDTA with gel for plasma separation</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Whole blood for lead testing</td>
<td>Tan</td>
<td>Tan</td>
<td>Dipotassium EDTA</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Plasma for trace elemnt, toxicology, nutrition tests</td>
<td>Royal Blue (Lavender label)</td>
<td>Royal Blue</td>
<td>Dipotassium EDTA</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Application</td>
<td>Safety closure color</td>
<td>Conventional stopper color</td>
<td>Additive</td>
<td>Number of inversions to mix</td>
<td>Order of Draw</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>----------------------</td>
<td>----------------------------</td>
<td>---------------------------------------------------</td>
<td>-----------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Plasma or serum for tests requiring inhibition of glycolysis (e.g. glucose, alcohol)</td>
<td>Gray</td>
<td>Gray</td>
<td>Sodium Fluoride/ Potassium oxalate/ Sodium Fluoride/Sodium EDTA Sodium Fluoride</td>
<td>8</td>
<td>7</td>
</tr>
</tbody>
</table>
Report Format

- Patient Information/ Demographics
- Client/Patient Collection Date
- Lab Details
- Test Performing Location
- Patient result
- Date from the performing Laboratory
- Date of sample received at NRL
- Decision/ Action
- Test performing Location details
NRL In-house Tests

- The laboratory will provide data of clinical performance claims to clients upon request to include performance specifications and supporting validation/verification data such as analytic accuracy, precision, analytic sensitivity, interferences, reference range, and reportable ranges as applicable.
- Measurement of Uncertainty (MOU) of each quantitative analyte performed in-house are established and readily available through the laboratory upon request.
- Tests performed across NRL testing site can be found on the NRL website https://www.nrl.ae/en/tests.html

Referred Out Tests

- Tests referred to an affiliated external laboratory can be found on the NRL website https://www.nrl.ae/en/tests.html
- Contact NRL Technical Support or Sales Executive

Consent Forms and Chain-of-Custody Form

The following test orders MUST include an attestation that the provider has the patient’s informed consent for testing.

- Genetic testing
- HIV and STD testing for walk in patients
- Specific drug of abuse, blood alcohol or any other tests that have medico legal significance should be accompanied by a chain-of-custody.

Confidentiality

All patient information is treated confidential as per NRL’s confidentiality agreement. All NRL employees signed an employee confidentiality agreement.

Laboratory collection manual approval

This collection manual is reviewed and approved by NRL Chief Medical officer electronically.