

NATIONAL CLINICAL MICROBIOLOGY REFERENCE LABORATORY

Department of Laboratory Services

About us

The main role of the National Clinical Microbiology Reference Laboratory is to identify the aetiologic agents of diseases caused by bacteria, fungi and parasites from a variety of clinical samples and provides antimicrobial susceptibility test results for clinically-significant isolates to the clinicians. Our laboratory offers services in the following disciplines of Clinical Microbiology; Bacteriology (aerobic and anaerobic), Antimicrobial Susceptibility Testing, Mycology, Infection Control Screening and Serology. We also perform other tests which includes Urinalysis and Stool microscopic examination, Cell count of body fluids, Urine pregnancy, Stool occult blood and Microfilaria parasite microscopy tests.

The National Clinical Microbiology Reference Laboratory works closely with Hospital Infection Control Unit in activities related to bacterial and fungal infections in all hospitals in Negara Brunei Darussalam. Our laboratory is also extensively committed to provide support for Antimicrobial Resistance Surveillance following Brunei Darussalam AMR National Action Plan and providing AMR data to WHO GLASS platform.

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Head of Section	EXT 6510
Specialist Clinical Microbiologist	EXT 6515
Main Laboratory	EXT 6329/6330
Blood Culture	EXT 6331
Bacterial Serology Lab	EXT 6332

Laboratory Personnel

Head of Section : Dr Muhd Haziq Fikry Hj Abdul Momin
Deputy Head of Section I : Jauharatud Dini Suhaimi
Deputy Head of Section II : Mohammad Aizzuddin Hj Mirasin

Specialist Clinical Microbiologist: Dr Terrence Chinniah
Medical Officer : Dr Stephen Pradeep Moses



Staff: Scientific Officers
 Medical Laboratory Technologists
 Laboratory Technicians
 Laboratory Assistants

Operating Hours

Monday to Thursday and Saturday
7.45am - 12.15pm and 1.30pm - 4:30 pm

24 Hours (On-Call)

Full operation during weekend and public holiday from 8.00 am to 12.00 pm; after 12.00pm will be on on-call basis

Test Catalogue

Amoeba, Microscopy

Specimen	Stool and aspirate in sterile screw-capped container, fresh
Unacceptable	Stool that appears to be dry on the surface or edges
Transport	Within 2 hours after collection.
Method	Light microscopy
TAT	STAT – 2 hours
Clinical Usage	Diagnosis of amoebiasis
Reference Range	Seen or Not seen

Anti-Streptolysin O Titre (ASOT)

Specimen	Blood (red top, 6mL or SSTII gold top, 5mL) Submit acute and convalescent sera 2 weeks apart
Unacceptable	Haemolysed, lipaemic and contaminated
Transport	Within 24 hours of specimen collection
Method	Latex agglutination
TAT	2 working days
Clinical Usage	Diagnosis of acute group A streptococci infection
Reference Range	< 200 IU/mL

Bacterial antigen

Specimen	CSF in sterile screw-capped container (1ml)
Unacceptable	Volume less than 1ml
Transport	Within 1 hour after collection
Method	Rapid latex agglutination
TAT	STAT – 2 hours (after time received)
Clinical Usage	Presumptive screen for common bacteria causing meningitis
Reference Range	Negative or Positive

Biofire Meningitis/Encephalitis (ME) Panel, CSF

Specimen	CSF collected via lumbar puncture in sterile screw-capped container
Unacceptable	CSF in non-sterile containers and with additives
Transport	Within 1 hour after collection
Method	Polymerase Chain Reaction (PCR)
TAT	1 day (from time of received)
Clinical Usage	Detection of meningitis and viral encephalitis
Reference Range	Detected or Not Detected of the following: <i>Escherichia coli</i> K1 <i>Haemophilus influenzae</i> <i>Listeria monocytogenes</i> <i>Neisseria meningitidis</i> <i>Streptococcus agalactiae</i> <i>Streptococcus pneumoniae</i> Cytomegalovirus Enterovirus Herpes simplex virus 1 Herpes simplex virus 2 Human herpesvirus 6 Human parechovirus Varicella zoster virus <i>Cryptococcus neoformans/gattii</i>

Blood Culture and sensitivity, Aerobic and Anaerobic

Specimen	10mL of blood into BacT/Alert FA plus aerobic and FN plus anaerobic bottles (send as a set). The first two/three sets (2 bottles/set) of blood culture to be obtained either at one time or over a brief time period from multiple venipuncture sites.
Unacceptable	Refrigerated specimen
Transport	Within 24 hours of specimen collection at room temperature
Method	Automated BacT/ALERT (colorimetric), Gram stain, conventional culture and identification by either biochemical tests, mass spectrometry, rapid agglutination and/ or serotyping. Antibiotic susceptibility testing using disk diffusion, MIC(Vitek 2XL) and/or Etest.
TAT	2 – 6 days (from time of received)
Clinical Usage	Diagnosis of septicaemia
Reference Range	No growth after 5 days incubation

Blood Culture and sensitivity, Myco F Lytic

Specimen	10mL of blood into one (1) BacT/Alert FA plus aerobic bottle
Unacceptable	Refrigerated specimen
Transport	Within 24 hours of specimen collection at room temperature
Method	Automated BacT/ALERT (colorimetric), Gram-stain and conventional culture
TAT	2 – 28 days (from time of received); slow growing fungus might take longer, hence preliminary result will be provided
Clinical Usage	Diagnosis of fungemia
Reference Range	No growth after 28 days incubation

Blood Culture and sensitivity, Paediatric

Specimen	1 to 3mL of blood into BacT/Alert PF plus bottle.
Unacceptable	Refrigerated specimen
Transport	Within 24 hours of specimen collection at room temperature
Method	Automated BacT/ALERT (colorimetric), Gram-stain, conventional culture and identification by either biochemical tests, mass spectrometry, rapid agglutination and/ or serotyping. Antibiotic susceptibility testing using disk diffusion, MIC(Vitek 2XL) and/or Etest.
TAT	2 – 6 days (from time of received)
Clinical Usage	Diagnosis of septicaemia
Reference Range	No growth after 5 days incubation

Cell count

Specimen	Body fluids in sterile screw-capped container or lavender-top EDTA tube. For synovial fluids, a capped syringe is acceptable (needle must be removed before submitting to the lab)
Unacceptable	Clotted and frank blood specimen
Transport	Within 2 hours at room temperature or within 24 hours if refrigerated
Method	Manual haemocytometer cell count and microscopy
TAT	1 day (from time of received)
Clinical Usage	Diagnosis of disease states such as meningitis, malignancy, inflammation and bacterial infection.
Reference Range	Total RBC : 0/mm ³ Total WBC : 0/ mm ³ No reference intervals are defined for differentials (%neutrophils and %lymphocytes)

Chlamydia antigen

Specimen	Endocervical swab in Chlamydia dry swab
Unacceptable	Specimen in Transwab® Amies
Transport	Within 6 hours at room temperature or within 24 hours if refrigerated
Method	Rapid chromatographic immunoassay
TAT	3 – 5 working days
Clinical Usage	Detection of <i>Chlamydia Trachomatis</i>
Reference Range	Positive or Negative

Chlamydia, urine	
Specimen	Urine in sterile screw-capped container (15ml), early morning specimen is preferred
Unacceptable	Urine in unsterile container (with additives)
Transport	Within 6 hours at room temperature or within 24 hours if refrigerated
Method	Rapid chromatographic immunoassay
TAT	3 – 5 working days
Clinical Usage	Detection of <i>Chlamydia Trachomatis</i>
Reference Range	Positive or Negative

Clostridium difficile Toxin	
Specimen	Loose, watery and unformed stool in sterile screw-capped container (1-2mL)
Unacceptable	Stool in unsterile containers and with additives
Transport	Less than 7 hours at room temperature or can be stable for 3 days if refrigerated.
Method	Rapid immunochromatographic assay
TAT	2 – 5 working days
Clinical Usage	Detects <i>Clostridium difficile</i> Toxin A and/or Toxin B and Glutamate Dehydrogenase (GDH)
Reference Range	Positive or Negative for clostridium difficile Toxin A, Toxin B and GDH

Cryptococcus antigen, CSF	
Specimen	CSF in sterile screw-capped container
Unacceptable	CSF in unsterile containers and with additives
Transport	Within 1 hour after collection
Method	Rapid latex agglutination
TAT	STAT – 2 hours (after time received)
Clinical Usage	Presumptive screen for meningitis
Reference Range	Positive or Negative

Cryptococcus antigen, Serum	
Specimen	Blood (red top, 6mL or SSTII gold top, 5mL)
Unacceptable	Haemolysed
Transport	Within 24 hours of specimen collection
Method	Rapid latex agglutination
TAT	2 working days
Clinical Usage	Presumptive screen for meningitis
Reference Range	Positive or Negative

Culture & Sensitivity, Acinetobacter Screening

Specimen	Specimen in transwab® Amies
Unacceptable	Chlamydia swab, dry swab and viral transport swab
Transport	Within 24 hours of specimen collection
Method	Conventional culture and identification by biochemical tests. Antibiotic susceptibility testing by disk diffusion and/or MIC (Vitek 2XL).
TAT	2 – 4 working days (from time of received)
Clinical Usage	Diagnosis of bacterial infection
Reference range	No Acinetobacter Baumannii isolated

Culture & Sensitivity, Catheter

Specimen	Specimen in transwab® Amies or Catheter in sterile screw-capped container
Unacceptable	Chlamydia swab, dry swab and viral transport swab
Transport	Within 24 hours of specimen collection
Method	Conventional culture and identification by either biochemical tests, mass spectrometry, rapid agglutination and/or serotyping. Antibiotic susceptibility testing by disk diffusion, MIC (Vitek 2XL) and/or Etest.
TAT	2 – 5 working days (from time of received)
Clinical Usage	Diagnosis of bacterial infection
Reference Range	No growth after 48 hours incubation

Culture & Sensitivity, CSF

Specimen	Specimen in sterile, screw-capped container. Do not refrigerate
Unacceptable	Refrigerated specimen
Transport	Within 1 hour after collection
Method	Automated BacT/ALERT (colorimetric) , Gram stain, conventional culture and identification by either biochemical tests, mass spectrometry, rapid agglutination and/ or serotyping. Antibiotic susceptibility testing by disk diffusion, MIC(Vitek 2XL) and/or Etest.
TAT	2 – 6 days or 14 days for Cryptococcus identification (from time of received)
Clinical Usage	Diagnosis of meningitis
Reference Range	No growth after 5 days incubation

Culture & Sensitivity, Ear

Specimen	Specimen in transwab® Amies
Unacceptable	Chlamydia swab, dry swab and viral transport swab
Transport	Within 24 hours of specimen collection
Method	Conventional culture and identification by either biochemical tests, mass spectrometry, rapid agglutination and/or serotyping. Antibiotic susceptibility testing by disk diffusion, MIC(Vitek 2XL) and/or Etest.
TAT	2 – 5 working days (from time of received)
Clinical Usage	Diagnosis of bacterial infection
Reference Range	No growth after 48 hours incubation

Culture & Sensitivity, Enteric Bacterial Pathogens (Stool, Bile)

Specimen	Stool in sterile screw-capped container with attached spatula Rectal swab using transwab® Amies Bile in sterile screw-capped container or in transwab® Amies
Unacceptable	Chlamydia swab, dry swab and viral transport swab
Transport	Within 24 hours of specimen collection
Method	Conventional culture and identification by either biochemical tests, mass spectrometry and/or serotyping. Antibiotic susceptibility testing by disk diffusion, MIC(Vitek 2XL) and/or Etest.
TAT	2 – 4 working days (from time of received)
Clinical Usage	Diagnosis of infection caused by enteric bacteria
Reference range	No growth after 48 hours incubation

Culture & Sensitivity, Eye swab and associated specimens

Specimen	Specimen in transwab® Amies
Unacceptable	Chlamydia swab, dry swab and viral transport swab
Transport	Within 24 hours of specimen collection
Method	Conventional culture and identification by either biochemical tests, mass spectrometry, rapid agglutination and/or serotyping. Antibiotic susceptibility testing by disk diffusion, MIC (Vitek 2XL) and/or Etest.
TAT	2 – 4 working days (from time of received)
Clinical Usage	Diagnosis of bacterial infection
Reference Range	No growth after 48 hours incubation

Culture & Sensitivity, Fluid

Specimen	Specimen in sterile screw -capped container. State source of the specimen.
Unacceptable	Swabs dipped in fluid
Transport	Within 24 hours of specimen collection
Method	Automated Bact/ALERT (colorimetric), conventional culture and identification by either biochemical tests, mass spectrometry, rapid agglutination and/ or serotyping. Antibiotic susceptibility testing by disk diffusion, MIC (Vitek 2XL) and/or Etest.
TAT	2 – 6 days (from time of received)
Clinical Usage	Diagnosis of bacterial infection
Reference Range	No growth after 48 hours incubation

Culture & Sensitivity, FNA (Fine Needle Aspirate)

Specimen	Specimen in sterile screw-capped container
Unacceptable	Specimens in unsterile container
Transport	Within 24 hours of specimen collection
Method	Conventional culture and identification by either biochemical tests, mass spectrometry, rapid agglutination and/ or serotyping. Antibiotic susceptibility testing by disk diffusion, MIC(Vitek 2XL) and/or Etest.
TAT	2 – 5 working days (from time of received)
Clinical Usage	Diagnosis of bacterial infection
Reference Range	No growth after 48 hours incubation

Culture & Sensitivity, Gastric aspirate from neonate	
Specimen	Specimen in sterile screw-capped container
Unacceptable	Chlamydia swab, dry swab and viral transport swab
Transport	Within 24 hours of specimen collection
Method	Conventional culture and identification by either biochemical tests, mass spectrometry, rapid agglutination and/or serotyping. Antibiotic susceptibility testing by disk diffusion, MIC(Vitek 2XL) and/or Etest.
TAT	2 – 4 working days (from time of received)
Clinical Usage	Diagnosis of bacterial infection
Reference range	No growth after 48 hours incubation

Culture & Sensitivity, Gram-Negative Bacilli Screening	
Specimen	Specimen in transwab® Amies
Unacceptable	Chlamydia swab, dry swab and viral transport swab
Transport	Within 24 hours of specimen collection
Method	Conventional culture and identification by either biochemical tests, mass spectrometry and/or serotyping. Antibiotic susceptibility testing by disk diffusion, MIC(Vitek 2XL) and/or Etest.
TAT	2 – 4 working days (from time of received)
Clinical Usage	Diagnosis of bacterial infection
Reference Range	No growth after 48 hours incubation

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Culture & Sensitivity, Infection Control Screening	
Specimen	Specimen in transwab® amies or exposed plate
Unacceptable	Chlamydia swab, dry swab and viral transport swab
Transport	Within 24 hours of specimen collection
Method	Conventional culture and identification by either biochemical tests, mass spectrometry, rapid agglutination and/or serotyping. Antibiotic susceptibility testing by disk diffusion, MIC(Vitek 2XL) and/or Etest.
TAT	2 – 4 working days (from time of received)
Clinical Usage	Diagnosis of bacterial infection
Reference Range	No growth after 48 hours incubation

Culture & Sensitivity, Methicillin-Resistant Staphylococcus Aureus (MRSA)	
Specimen	Specimen in transwab® Amies
Unacceptable	Chlamydia swab, dry swab and viral transport swab
Transport	Within 24 hours of specimen collection
Method	Conventional culture and identification by rapid agglutination and biochemical tests. Antibiotic susceptibility testing by disk diffusion and/or MIC (Vitek 2XL).
TAT	2 – 4 working days (from time of received)
Clinical Usage	Diagnosis of bacterial infection
Reference range	No MRSA isolated

Culture & Sensitivity, Nasal

Specimen	Specimen in transwab® Amies
Unacceptable	Chlamydia swab, dry swab and viral transport swab
Transport	Within 24 hours of specimen collection
Method	Conventional culture and identification by either biochemical tests, mass spectrometry, rapid agglutination and/or serotyping. Antibiotic susceptibility testing by disk diffusion, MIC(Vitek 2XL) and/or Etest.
TAT	2 – 5 working days (from time of received)
Clinical Usage	Diagnosis of upper respiratory tract infection
Reference range	No growth after 48 hours incubation

Culture & Sensitivity, Peritoneal dialysis fluid

Specimen	10mL fluid in BacT/Alert FA plus aerobic and FN plus anaerobic bottles Do not refrigerate
Unacceptable	Specimens in unsterile container.
Transport	Within 24 hours of specimen collection
Method	Automated BacT/ALERT (colorimetric), conventional culture and identification by either biochemical tests, mass spectrometry, rapid agglutination and/ or serotyping. Antibiotic susceptibility testing by disk diffusion, MIC(Vitek 2XL) and/or Etest.
TAT	2 – 6 days (from time of received)
Clinical Usage	Diagnosis of peritonitis
Reference Range	No growth after 5 days incubation

Culture & Sensitivity, Pus, Abscess, Wound, Cord, Tissue, Biopsy, Bone or Skin

Specimen	Specimen in sterile screw-capped container or Amies transport swab or syringe without needle and capped in a sealed plastic bag.
Unacceptable	Specimens in formalin
Transport	Within 24 hours of specimen collection
Method	Conventional culture and identification by either biochemical tests, mass spectrometry, rapid agglutination and/or serotyping. Antibiotic susceptibility testing by disk diffusion, MIC(Vitek 2XL) and/or Etest.
TAT	2 – 5 working days (from time of received)
Clinical Usage	Diagnosis of bacterial infection
Reference Range	No growth after 48 hours incubation

Culture & Sensitivity, Sputum

Specimen	Sputum in sterile screw-capped container
Unacceptable	Saliva; food-containing specimen
Transport	Within 24 hours of specimen collection
Method	Conventional culture and identification by either biochemical tests, mass spectrometry, rapid agglutination and/ or serotyping. Antibiotic susceptibility testing by disk diffusion, MIC(Vitek 2XL) and/or Etest.
TAT	2 – 5 working days (from time of received)
Clinical Usage	Diagnosis of lower respiratory tract infection
Reference range	No growth after 48 hours incubation

Culture & Sensitivity, Throat

Specimen	Specimen in Transwab® Amies
Unacceptable	Chlamydia swab, dry swab and viral transport swab
Transport	Within 24 hours of specimen collection
Method	Conventional culture and identification by either biochemical tests, mass spectrometry and/or serotyping. Antibiotic susceptibility testing by disk diffusion and/or MIC(Vitek 2XL)
TAT	2 – 5 working days (from time of received)
Clinical Usage	Diagnosis of lower respiratory tract infection
Reference range	No growth after 48 hours incubation

Culture & Sensitivity, Tracheal Aspirate/Endotracheal Aspirate (ETTA)

Specimen	Specimen in sterile screw-capped container
Unacceptable	Specimen in unsterile container
Transport	Within 24 hours of specimen collection
Method	Conventional culture and identification by either biochemical tests, mass spectrometry, rapid agglutination and/or serotyping. Antibiotic susceptibility testing by disk diffusion, MIC(Vitek 2XL) and/or Etest.
TAT	2 – 5 working days (from time of received)
Clinical Usage	Diagnosis of bacterial infection
Reference Range	No growth after 48 hours incubation

Culture & Sensitivity, Urine

Specimen	Specimen in sterile screw-capped container, indicate MSU, catheterised or SPA (12mL)
Unacceptable	Specimen in Amies transwab
Transport	Within 24 hours of specimen collection
Method	Conventional culture and identification by either biochemical tests, mass spectrometry, rapid agglutination and/or serotyping. Antibiotic susceptibility testing by disk diffusion, MIC(Vitek 2XL) and/or Etest.
TAT	2 – 4 working days (from time of received)
Clinical Usage	Diagnosis of urinary tract infection
Reference Range	No growth

Culture & Sensitivity, Urogenital tract and associated specimens

Specimen	Specimen in Transwab® Amies. State source of specimen
Unacceptable	Chlamydia swab, dry swab and viral transport swab
Transport	Within 24 hours of specimen collection
Method	Conventional culture and identification by either biochemical tests, mass spectrometry, rapid agglutination and/or serotyping. Antibiotic susceptibility testing by disk diffusion, MIC(Vitek 2XL) and/or Etest.
TAT	2 – 4 working days (from time of received)
Clinical Usage	Diagnosis of bacterial infection
Reference range	No growth after 48 hours incubation

Culture for Fungus	
Specimen	Specimen in sterile screw-capped container
Unacceptable	Transwab® Amies swab or dry swab
Transport	Within 24 hours of specimen collection
Method	Conventional culture, light microscopy and identification by either biochemical tests and mass spectrometry
TAT	2 – 28 days (for late growing fungus, it might take longer, preliminary result will be given)
Clinical Usage	Diagnosis of fungal infection
Reference range	No growth after 4 weeks incubation

Fungus KOH examination	
Specimen	Specimen in sterile screw-capped container, corneal scraping on a clean glass slide
Unacceptable	Transwab® Amies swab or dry swab
Transport	Within 24 hours of specimen collection
Method	Light microscopy
TAT	1 – 2 working days after time received)
Clinical Usage	Presumptive diagnosis of fungal infection
Reference Range	No spores and hyphae seen

Gram-Stain	
Specimen	Specimen in sterile screw-capped container or Amies transwab. Smear on a labelled slide
Unacceptable	Chlamydia swab, dry swab and viral transport swab
Transport	Within 24 hours of specimen collection
Method	Light microscopy
TAT	1 day, STAT – 2 hours (after time received)
Clinical Usage	Presumptive diagnosis of bacterial infection
Reference Range	No organism seen

India Ink	
Specimen	CSF in sterile screw-capped container (1 mL)
Unacceptable	Volume less than 1 mL
Transport	Within 1 hour after specimen collection
Method	Light microscopy
TAT	2 hours (from time of received)
Clinical Usage	Presumptive identification of <i>Cryptococcus neoformans</i>
Reference Range	Cryptococcus not seen

Microbial Identification Test (BD Affirm)

Specimen	Vaginal fluid specimen in Ambient Temperature Transport System (ATTS)
Unacceptable	Normal swab
Transport	Within 72 hours of specimen collection at room temperature
Method	DNA Probe Test (BD Affirm)
TAT	1 – 3 working days
Clinical Usage	Detection of <i>Candida</i> species, <i>Gardnerella vaginalis</i> and <i>Trichomonas vaginalis</i>
Reference Range	Negative

Microfilaria parasite

Specimen	Blood (EDTA, purple top, 3 – 5mL), best taken between 8pm – 2 am
Unacceptable	Insufficient volume
Transport	Within 24 hours of specimen collection
Method	Microscopy
TAT	1 – 2 working days
Clinical Usage	Diagnosis of filariasis
Reference Range	Not seen

Microscopy, Stool

Specimen	Stool in sterile screw-capped container with attached spatula Bile in sterile screw-capped container
Unacceptable	Stool swab, leaking sample container
Transport	Within 2 hours after collection at room temperature
Method	Light microscopy
TAT	1 day, STAT – 2 hours
Clinical Usage	Diagnosis of parasitic infections
Reference Range	RBC : Not seen WBC : Not seen Ova : Not seen

Microscopy, Urine

Specimen	Urine in sterile screw-capped containers (15-20mL)
Unacceptable	Leaking sample container, quantity not sufficient
Transport	Within 2 hours at room temperature or 24 hours if refrigerated
Method	Automated and Light Microscopy
TAT	1 day
Reference Range	RBC : Few (0-3/hpf) WBC : Few (0-3/hpf) Bacteria : Few (0-3/hpf) Casts : Nil Yeast : Nil Crystal : Nil Epithelial cells : Nil

Stool Occult Blood

Specimen	Stool in sterile screw-capped container with attached spatula
Unacceptable	Stool swab, leaking sample container
Transport	Within 6 hours at room temperature and 72 hours if refrigerated
Method	Immunochemical
TAT	1 day
Clinical Usage	Detect the presence of haemoglobin in stool
Reference Range	Negative

Urinalysis

Specimen	Random, mid-stream urine in sterile screw-capped containers (15-20mL)
Unacceptable	More than 24 hours old
Transport	Within 2 hours at room temperature or 24 hours if refrigerated
Method	Manual Dipstick or Automated urine analyzer
TAT	1 day, STAT – 1 hour
Reference Range	pH : 5.5-8.5 Specific Gravity : 1.005-1.025 Leukocytes : Negative Nitrite : Negative Urine protein, total : Negative Glucose : Negative Ketone : Negative Urobilinogen : Normal Bilirubin : Negative Blood : Negative

Urine Pregnancy Test

Specimen	Urine in sterile screw-capped container (10mL), early morning specimen is preferred
Transport	Within 2 hours at room temperature or 24 hours if refrigerated
Method	Immunochromatographic test
TAT	1 day, STAT – 1 hour
Clinical Usage	Diagnosis of pregnancy and gestational trophoblastic diseases
Reference Range	Positive or Negative