

# Microbiology and Microbial Serology

## Notes

Complete clinical history (including recent travel) is important. Please request tests individually (profiles not acceptable) and include the nature and site of the specimen. Some serological tests can be diagnostic on testing of acute phase serum (e.g. detecting IgM antibodies), while some tests require paired sera 14 days apart.

## Antenatal Screening

- HepBsAg
- Rubella
- HIV
- Syphilis

## CNS

- Blood culture
- CSF
  - Differential Cell Count
  - Glucose
  - Chloride
  - Protein
  - Bacterial Culture
  - TB Culture
  - Virus PCR
  - HSV
  - Enterovirus
  - CMV
  - HIV
  - Bacterial PCR
  - N. Meningitidis
  - Cryptococcus Antigen
- Serology
  - Arbovirus
  - HSV
  - Meningococcal IgM
  - Measles
  - Mumps
  - Syphilis
  - Cryptococcus
  - Toxoplasma
  - Rubella

## Cardiac

### Serology

- Cat Scratch Disease (CSD)
- Enterovirus
- Q Fever
- Streptococcal
- Toxoplasma
- Syphilis

### PCR

- Cat Scratch Disease (CSD)
- Cardiac Tissue

## Congenital Screening

- CMV
- Rubella
- Toxoplasma
- HSV 1&2
- Syphilis

## Diarrhoea

### Faeces

- Microscopy
  - Ova
  - Cysts
  - Parasites
- Culture for pathogens
  - Bacteria
  - Viral culture not performed

## Rotavirus Assay

- PCR
  - Clostridium difficile toxin gene (antibiotic associated diarrhoea)
  - EHEC (Enterohaemorrhagic E coli) PCR

## Genital

### Genital Herpes

- PCR
- Serology

### Genital Sore

- HSV PCR
- Microscopy/Culture
- Syphilis Serology

### Genital Discharge

- Chlamydia PCR
- Gonococcal PCR
- Microscopy/Culture
- Syphilis Serology
- Trichomonas
- PCR

## Hepatitis A, B, C

Please request specific tests.

### Acute Investigation

- Hep A IgM
- HCV
- HBsAg

### Infectivity Status

- HBsAg
- HCV

### Immunity/Post Vaccination

- HBsAb
- Hep A IgG

## Other Hepatitis

- Amoebic
- CMV
- Hep E
- Leptospira
- Brucella
- EBV
- Hydatid
- Q Fever

## Lymphadenopathy/Mononucleosis

### Serology

- Adenovirus
- HIV
- Brucella
- Cytomegalovirus
- Cat Scratch Disease (CSD)
- EBV
- Mumps
- Rubella

## INTERPRETATION OF HEPATITIS B SEROLOGY

Pattern	HBsAg	HBeAg	HBcAb	HBcIgM	HBeAb	HbsAb	Infective
Early Acute	+	+					++
Acute	+	+	+	+			++
Resolving			+	+	+	+/-	+/-
Past			+		+/-	+/-	-
Chronic	+	+/-	+		+/-		++
Post Immunisation						+	

## Syphilis

- Toxoplasma
- PCR
  - Cat Scratch Disease (CSD)
  - Lymph node tissue

## Pyrexia of Unknown Origin (PUO)

- Blood Culture x 3
- Urine Micro & Culture
- Malarial Films
- Culture of any cutaneous lesion or exudate (e.g. sputum)
- Serology
  - Leptospira
  - Brucella
  - Q Fever
  - Mycoplasma
  - Toxoplasma
  - Dengue PCR
  - Arbovirus
  - Influenza
  - Salmonella
  - Rickettsia
  - Cat Scratch Disease
- Mantoux Skin Test

## Rash

### Vesicular

- HSV PCR
- VZV PCR
- Enterovirus PCR (Throat, Skin Lesions)
- Micro & Culture for Bacteria
- Serology
  - Echocoxsackie
  - HSV
  - VZV
  - Rickettsiae

### Nonvesicular

- Micro & Culture for Dermatophytes
- Serology
  - Rubella
  - Ross River
  - Barmah Forest
  - Dengue
  - Measles
  - Arbovirus
  - Rickettsia
  - CMV
  - Syphilis

## Parvovirus

- HIV
- Streptococcus

## Renal Tract Infection

- Urine & Micro Culture
- Blood Cultures (Systemic Symptoms) x 2
- Serology
  - ASOT/Anti DNase B titres (nephritis)

## Respiratory Infections

### Upper

- Culture (Throat Swab)
- Bordetella Pertussis PCR (Throat Swab/NPA)
- Respiratory Virus PCR (NPA)
  - RSV
  - Influenza
  - Parainfluenza
  - Adenovirus
- Serology
  - ASOT/Anti DNase B
  - Bordetella Pertussis
  - Influenza

with adenopathy:

- Infectious Mononucleosis
- Toxoplasma
- CMV
- Adenovirus

### Lower - Acute

- Micro & Culture (Sputum)
- Blood Cultures x 2
- Legionella PCR (Sputum)
- Legionella Urinary Antigen (Urine)
- Mycoplasma PCR (sputum)
- Serology
  - Mycoplasma
  - Psittacosis
  - Q Fever
  - Legionella
  - Cryptococcus
  - Influenza
  - Chlamydia pneumoniae

### Lower - Nonresolving

- Culture (Sputum)
- Fungi x 3
- MTB Micro & Culture x 3
- Sputum Malignant Cells x 3
- Mantoux Skin Test
- Serology
  - Mycoplasma
  - Legionella
  - Fungal Precipitins (Aspergillus, Micropolyspora, Thermoactinomyces)
  - HIV
  - Herpes
- BAL (Bronchial Alveolar Large) - D/w Microbiologist

## QML PATHOLOGY LABORATORIES

### BRISBANE & SURROUNDING AREAS

Central Laboratory - Brisbane	(07) 3121 4444
North West Stat Laboratory - Everton Park	(07) 3353 0382
St Andrews Stat Laboratory - Spring Hill	(07) 3832 6011
Sunnybank Stat Laboratory - Sunnybank	(07) 3344 5682
Wesley Stat Laboratory - Auchenflower	(07) 3371 9462

### BUNDBERG

Bundaberg Laboratory	(07) 4152 8411
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### CAIRNS

Cairns Laboratory	(07) 4051 8944
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### CENTRAL QUEENSLAND

Emerald Laboratory	(07) 4982 0306
Gladstone Laboratory	(07) 4972 2877
Rockhampton Laboratory	(07) 4921 2155

### GOLD COAST, TUGUN & NORTHERN RIVERS

Ballina Laboratory	(02) 6686 6424
Pindara Stat Laboratory	(07) 5527 9188
Southport Laboratory	(07) 5571 4444
Tugun Laboratory	(07) 5598 0822

### IPSWICH, DARLING DOWNS & GRANITE BELT

Ipswich Laboratory	(07) 3281 8888
Toowoomba Stat Laboratory	(07) 4638 9149

### KINGAROY

Kingaroy Laboratory	(07) 4162 1499
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### MACKAY

Mackay Laboratory	(07) 4951 2999
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### REDCLIFFE

Redcliffe Laboratory	(07) 3284 6666
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### SUNSHINE COAST & GYMPIE

Buderim Laboratory	(07) 5441 0200
Gympie Laboratory	(07) 5441 0200
Noosa Stat Laboratory	(07) 5455 9400

### TOWNSVILLE

Townsville Laboratory	(07) 4779 0158
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# Test Selection Guide

# Chemistry

## Acceptable Test Groupings Approved Abbreviations in Parenthesis

Blood Gases	
• pO2	• HCO3
• pCO2	• base excess
• pH	• O2 saturation

Electrolytes (E)	
• Sodium (Na)	• Bicarbonate (HCO3)
• Potassium (K)	• Anion Gap
• Chloride (Cl)	

Immunoglobulins	
• IgG	• IgA
• IgM	• IgE

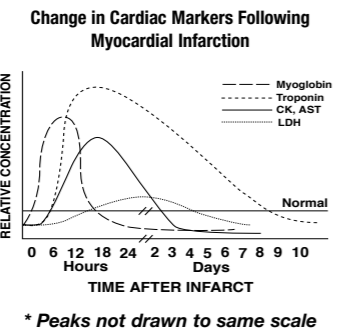
Lipid Studies	
• Cholesterol (CHOL)	
• Triglycerides (TRIG)	
• Classification of hyperlipidaemia where indicated.	
• High density lipoprotein cholesterol when specifically requested (HDL).	

Liver Function Tests (LFT)	
• Total Bilirubin (BILI.T)	
• Conjugated Bilirubin (BILI.D)	
• Alkaline Phosphatase (ALP)	
• Gamma Glutamyl Transferase (GGT)	
• Alanine Amino Transferase (ALT)	
• Aspartate Amino Transferase (AST)	
• Albumin (ALB)	
• Globulins	
• Total Protein	
• Lactate Dehydrogenase (LDH)	

Markers of Heart Disease	
• Troponin (most specific)	
• Myoglobin (earliest)	
• BNP (heart failure)	
Others:	
• Aspartate Amino Transferase (AST)	
• Lactate Dehydrogenase (LDH)	
• Creatine Kinase (CK), CKMB	

Specific Protein Quantitation	
• IgG	• Alpha-1 antitrypsin
• IgA	• ACE (Angiotensin Converting Enzyme)
• IgM	• APO B
• IgE	• APO A1
• C3	• Haptoglobin
• C4	
• IgG Subclasses	

Therapeutic Drug Monitoring	
<b>Analgesics</b>	<b>Vitamins</b>
• Salicylate	• Vitamin A
• Paracetamol	• Vitamin E
<b>Antibiotics</b>	• Vitamin B1
• Amikacin	• Vitamin B2
• Gentamicin	• Vitamin B6
• Tobramycin	• Vitamin C
• Vancomycin	• Vitamin D
<b>Antiepileptics</b>	<b>Drug Screening</b>
• Carbamazepine	• Cotinine
• Clonazepam	• Urine/Serum
• Lamotrigine	<b>Psychoactive</b>
• Gabapentin	• Benzodiazepines
• Vigabatrin	(list specific requirements)
• Phenobarbital	- clobazam
• Phenytoin	- clonazepam
• Primidone	- diazepam
• Sulthiame	- nitrazepam
• Valproate	- oxazepam
<b>Antineoplastic</b>	- temazepam
• Methotrexate	• Clozapine
<b>Bronchodilators</b>	• Thioridazine
• Theophylline	• Mianserin
<b>Cardiac</b>	• Fluoxetine
• Digoxin	• Olanzapine
• Quinidine	• Lithium
• Perhexilene	• Tricyclics
• Amiodarone	- amitriptyline
• Mexilitine	- clomipramine
• Flecainide	(norclomipramine)
<b>Immunosuppressive</b>	- desipramine
• Cyclosporine	- doxepin
• Tacrolimus (FK506)	- nordoxepin
• Sirolimus	- imipramine
(Rapamycin)	- nortriptyline
	- trimipramine
	• Mycophenolicacid



# Cytology/Histology

Non Gynaecological Cytology	
<b>Body Fluids</b>	
• Pleural Fluid	
• Ascitic/Peritoneal Fluids	
• Peritoneal Washings	
• Pericardial Fluid	
• Synovial Fluid	
• Ovarian Fluid	
• Gastric Fluid	
• Cerebrospinal Fluid	
<b>Miscellaneous</b>	
• Nipple Discharge	
• Oral Cavity Smears	

Fine Needle Aspirate	
• Breast	• Head & Neck
• Lung	• Lymph Node
• Thyroid	• Soft Tissues
• Prostate	• Superficial Palpable Lesions
<b>Respiratory</b>	
• Sputum	
• Bronchial Brushings	
• Bronchial Washings	
• Bronchoalveolar Lavage	
<b>Urinary Tract</b>	
• Bladder Washings	• Urine
• Urothelial Washings	

# Genetics

Andrology	
• Seminal Analysis	
• Antisperm Antibodies	
<b>Cytogenetics</b>	
• Prenatal	
• Postnatal	
• Oncology	
<b>Fluorescent In Situ Hybridisation (FISH)</b>	
• Microdeletion Syndromes	

Molecular Genetics	
• Aneuploidy Screening	
• Telomere Screening	
• Oncology	
- Fusion Probes for common haematological malignancies e.g. <i>t(9;22) bcr/abl</i>	
- Multiple Myeloma Panel	
- CLL Panel	
• Paraffin Tissue Studies	
- Her2/Neu	
- Oligodendroglioma	
- Lymphoma	

Multiple Biochemical Analysis (E/LFT)	
• Sodium (Na)	
• Potassium (K)	
• Chloride (Cl)	
• Bicarbonate (HCO3)	
• Anion Gap	
• Glucose (GLUC)	
• Urea (U)	
• Creatinine (C)	
• Estimated GFR (eGFR)	
• Urate (URAT)	
• Total Bilirubin (BILI.T)	
• Alkaline Phosphatase (ALP)	
• Gamma Glutamyl Transferase (GGT)	
• Alanine Amino Transferase (ALT)	
• Aspartate Amino Transferase (AST)	
• Lactate Dehydrogenase (LD)	
• Calcium (Ca)	
• Corrected Calcium	
• Inorganic Phosphate (PHOS)	
• Total Protein (PROT)	
• Albumin (ALB)	
• Total Globulins	
• Iron	
• Cholesterol (CHOL)	
• Triglycerides (TRIG)	

Abnormal Protein Investigation	
• Serum Protein Electrophoresis	
• Cryoglobulins/Cryofibrinogen	
• Immunoglobulin Quantification	
• Immunofixation Studies	
• Bence Jones Protein	
• Serum Free Light Chains	

Amniotic Fluid	
• Alpha Fetoprotein	
• Bilirubin	
• Cytogenetics	
• L/S ratio	

Calcium Metabolism	
• Serum Ionised Calcium	
• Serum Parathormone	
• Serum 25 Hydroxy Vitamin D	

Gastrointestinal	
• 24hr Urinary 5HIAA	
• Serum Serotonin	
• Other gut derived hormones on request.	
By appointment:	
• Xylose Absorption/3 Day Faecal Fat	
• Breath hydrogen study with lactose or other sugar loading.	

Renal Function	
• Serum Urea	• Creatinine Clearance
• Serum Creatinine	• 24hr Urinary Protein
• Serum Urate	• Timed Urinary Albumin

Gynaecological Cytology	
• Cervical Smear	
• Factor V Leiden	
• Prothrombin G20210A	
• Apolipoprotein E Genotyping	
• MTHFR Mutation	
• B Cell IgH Gene Rearrangement	
• Bcl-1	
• Bcl-2	
• T cell Receptor Gene Rearrangement	
• bcr/abl	

Toxicology	
• Comprehensive drug screen on urine, blood or saliva (urine preferred except for alcohol).	
• Heavy metals:	
- Lead	
- Mercury	
- Cadmium	
• Red Cell & Serum Cholinesterase	
• Carboxyhaemoglobin	
• Methaemoglobin	
• Carbohydrate Deficient Transferrin	

Miscellaneous	
• Porphyrins:	
- Blood, Urine, Faeces	
• Ammonia & Lactate	
• Metabolic Disease Screen	
• Faecal Sugar	
• Copper	
• Zinc	
• Magnesium	
• Special Proteins	
• Urine & Serum Osmolality (assayed)	
• Serum Cholinesterase with Dibucaine Inhibition	
• Sweat Electrolytes	
• Glucose Tolerance Test	
• HbA1c/Fructosamine	
• Urinary Microalbumin	
• Amylase/Lipase	
• Acid Phosphatase	
• Muscle CK	
• Alkaline Phosphatase & LD Isoenzymes	
• Urinary VMA (HMMMA)	
• Metanephrines/Catecholamines	
• Intestinal Disaccharidases	
• Pancreatic Elastase	
• Zinc Protoporphyrin	
• NTX (N-Telopeptide Cross-Links)	
• DPD (Deoxyripyridinoline)	
• Homocysteine	

Occupational Drug Screen to AS/NZS 4308:2008	
• Immunoassay	
- Cannabinoids	
- Benzodiazepines	
- Cocaine	
- Sympathomimetic Amines	
- Opiates	
- Methadone (as requested)	
- Barbiturates (as requested)	
- Ethanol (alcohol, as requested)	
• GCMS and LCMS confirmation	
- Cannabinoids (TCC)	
- Benzodiazepines (BDC)	
- Cocaine (CME)	
- Sympathomimetic Amies (SYM)	
- Opiates (OPC)	

# Endocrinology

Thyroid Function Tests (TFT)	
• TSH as screen	
• Free T4 if:	
- TSH is abnormal	
- Follow Up	
- Dementia/Psychiatric	
- Amenorrhoea/Infertility	
- ? Pituitary Disease	
- On Amiodarone, Lithium	
- Sick euthyroid in hospital	
• Thyroid Antibodies, TSH Receptor Ab, ESR if:	
- ? Chronic Thyroiditis	
- ? Acute Thyroiditis	
- ? Graves'/Hashimoto's	
- ? Follow Up	

Diabetes	
• 1 or 2 hr post prandial glucose & insulin	
• C Peptide	
• Glucagon Stimulation Test	

Gastritis	
• Gastrin	
• Urea Breath Test	
<b>Growth</b>	
• Growth Hormone	
• Somatomedial C (IGF-1)	
<b>Adrenal Function</b>	
<b>Cushing's</b>	
• Cortisol + ACTH	
• 24hr Urinary Cortisol	
• Overnight Dexamethasone Suppression Test	
<b>Addison's</b>	
• Cortisol + ACTH	
• Synacthen Stimulation Test	
<b>Amenorrhoea</b>	
• Pregnancy Test	• Oestradiol
• LH:FSH	• Prolactin
? Adrenal/Thyroid/Pituitary Disease	

Hypertension	
• Renin + Aldosterone	
<b>Hirsutism</b>	
• LH:FSH	• DHEA Sulphate
• Oestradiol	• Androstenedione
• Testosterone	• SHBG
<b>Antenatal</b>	
• HCG	
• Progesterone	
• ? Ectopic - lower than expected HCG	
<b>Down's Screen</b>	
<b>First Trimester (11-13 wks 6 days)</b>	
• Free BHCg	
• PAPP-A	
<b>Second Trimester including Spina Bifida Screen (15-18 wks is best but can be done at 14-22 wks)</b>	
• AFP	• HCG
• Free Oestriol	

Calcium Homeostasis	
• Parathyroid Hormone (PTH)	
• Calcium + Albumin + Ionised Calcium	
• Random Urinary Calcium Clearance	
<b>Tumour Markers</b>	
• PSA	
<b>Breast</b>	
• CA 15-3	
• CEA	
<b>Ovary</b>	
• CA125	
• CA19-9	
<b>Coln</b>	
• CEA	
• CA19-9	

# Haematology/Blood Bank

QML Pathology Warfarin Care Clinic Patient Registration  
1300 795 355

Acceptable Test Groupings Approved Abbreviations in Parenthesis	
<b>Complete Blood Examination (FBC, FBE, CBE, CBP)</b>	
• Haemoglobin (Hb)	
• Haematocrit (PCV)	
• Red Cell Count (RBC)	
• Red Cell Indices	
• Leucocyte Count (WBC)	
• Platelet Count	
• Differential Leucocyte Count	
• Blood Film Examination	

Thalassaemia/Haemoglobinopathy Screen	
• Hb	
• Red Cell Indices	
• Hb Electrophoresis	
• HbA2	
• HbF Quantification	
• HbH Bodies	

Coagulation Screen (COAG)	
Includes:	
• PT	
• APTT	
• Fibrinogen	
• Platelet Count	
• TCT	

Cross Matching	
Includes test for Rh and/or other blood group antibodies.	

Bone Marrow Examination	
Please state if cytogenetics or markers are required.	
<b>Marrow Booking: (07) 3121 4573</b>	

*Suggested tests for common haematological disorders from which a selection may be made. These tests must be requested individually.*

Leukaemia/Lymphoma	
• FBC	
• Bone Marrow Examination	
• Cytogenetics	
• Molecular Genetics	
• Cell surface markers as indicated.	

Polycythaemia	
• EPO	
• JAK-2	
<b>Anaemias</b>	
<b>Haemolytic</b>	
• FBC/Retics	
• Bilirubin/LDH	
• Haptoglobin	
• Coombs test	
<i>Where indicated:</i>	
• Hypertonic Cryohaemolysis	
• Cold Agglutinins	
• ANA	
• G6PD	
• Unstable Hb	
• PNH Screen	
• Flow cytometry screening for hereditary spherocytosis.	

Macrocytic	
• FBC/Retics/Combs Test	
• E/LFT	
• Red Cell Folate/B12	
• TSH	
<i>Where necessary:</i>	
• Intrinsic Factor Abs	
• Bone Marrow Examination	

Microcytic	
• FBC/Retics	
• Iron Studies	
• Zinc Protoporphyrin (ZPP)	

*If unhelpful consider Haemoglobinopathy, Thalassaemia or Sideroblastic Anaemia.*

Normocytic	
• FBC/Retics	
• ESR	
• Iron Studies	
• Red Cell Folate/B12	
• E/LFT	
• EPP/Urine Bence Jones Protein	
• TSH	
• ANA	
• LH/Testosterone (Males)	
<i>Where indicated:</i>	
• Bone Marrow Examination	