

C

C1 ESTERASE INHIBITOR

Specimen required: **Serum (1 x SST)**
Department: Biochemistry/ Referred test
Reference range: 0.15 - 0.35 g/L
Comment: Used in the investigation of angioedema.
Serum C1 esterase inhibitor levels may be normal in patients with a functional defect of the protein. If this is suspected, a functional C1 esterase inhibitor assay should be requested and serum collected as for a CH50.

C1q

See Complement C1q

CA 15-3

Specimen required: **Serum (1 x SST)**
Department: Biochemistry
Reference range: 0 - 25 kU/L
Comment: Mammary cancer marker. Rarely elevated in localised disease.

CA 19-9

Specimen required: **Serum (1 x SST)**
Department: Biochemistry
Reference range: 0 - 37 kU/L
Comment: Pancreatic cancer marker. May also be raised in gastric, hepatocellular and sometimes colonic cancer.

CA 72-4

Specimen required: **Serum (1 x SST)**
Department: Biochemistry
Reference range: as stated on report
Comment: Gastric cancer marker.

CA 125 ANTIGEN

Specimen required: **Serum (1 x SST)**
Department: Biochemistry
Reference range: 0 - 35 kU/L
Comment: Ovarian cancer marker. May also be raised in other gynaecological neoplastic disease. Mild increases may be associated with early and ectopic pregnancy, endometriosis, pelvic inflammatory disease, peritonitis and renal failure.

CA 549 ANTIGEN

TEST NO LONGER PERFORMED - REPLACED BY CA 15-3. See above

CADMIUM

Specimen required: **2 x Trace Element (Royal blue top K₂EDTA) / 24 hour Urine (no preservative), or random urine**
Department: Biochemistry / Referred test
Reference range: As stated on report

CAERULOPLASMIN

Specimen required: **Serum (1 x SST)**
 Department: Referred test
 Reference range: 0.20 - 0.45 g/L.
 Interpretation: LOW - Wilson's disease, chronic hepatitis.
 Note: Usually performed in conjunction with Copper assay.

CALCITONIN

Specimen required: **Serum (1 x SST). Separate ASAP and send sample frozen**
 Department: Referred test
 Reference range: As stated on report.

CALCIUM EXCRETION

Specimen Required: **Spot fasting urine and Serum (1 x SST)**
 Department: Biochemistry
 Tests Performed: Urine creatinine and calcium; Serum creatinine
 Reference range: Males: 40 – 120 mmol/L GF
 Females: 30 – 100 mmol/L GF

CALCIUM (FREE)

See Calcium (Ionised)

CALCIUM (IONISED)

Specimen required: **1 x SST Spin but do not open. Attach a Process Immediately sticker**
 Department: Biochemistry
 Reference range: 1.12 - 1.32 mmol/L (pH adjusted to 7.40)
 Interpretation: As for Calcium (corrected)

CALCIUM (SERUM)

Specimen required: **Serum (1 x SST)**
 Department: Biochemistry
 Reference range: 2.15 - 2.55 mmol/L (Corrected Calcium)
 Interpretation: HIGH - Carcinoma with osteolytic bone metastases, hyperparathyroidism, hypervitaminosis D, Paget's disease,
 LOW - Hypoparathyroidism, Vitamin D deficiency, acute pancreatitis.

CALCIUM (URINARY RANDOM/24 HOURS)

Specimen required: **Random – Spot urine**
24 hour - collection bottle with 20 ml 50% HCl. (Warn patient of acid danger)
 Department: Biochemistry
 Reference range: 2.0 - 7.5 mmol/day
 Interpretation: HIGH - Hyperparathyroidism, high serum calcium, osteoporosis.
 LOW - Renal failure, nephrotic syndrome.
 Comment: Strongly affected by diet.

CALCIUM, SPOT URINE (CALCIUM/CREATININE RATIO)

Specimen required: **Spot urine no preservative**
 Department: Biochemistry

CALCIUM STUDIES

Specimen required: **2 x SST (Serum)**
 Department: Biochemistry

CALCULUS ANALYSIS

See Renal Stones

CALPROTECTIN

Specimen required: **Faeces**
 Department: Referred

CAMPYLOBACTER JEJUNI / COLI

Specimen required: **Faeces for culture**
 Department: Microbiology
 Notes: Campylobacter may be requested in Guillain-Barre syndrome. Check with Microbiologist.

CAMPYLOBACTER SEROLOGY

Specimen required: **Serum (1 x SST)**
 Department: Referred test
 Notes: Is available and may be useful in a setting of Guillain-Barre syndrome. Check with Microbiologist.
 Comment: Campylobacter serology may be requested in Guillain-Barre syndrome. Not to be confused with Helicobacter Serology.

CANCER ASSOCIATED SERUM ANTIGEN (CASA)

TEST NO LONGER PERFORMED - REPLACED BY CA19-9 AND CA125

CANDIDA CULTURE

See SWABS

CANDIDA SEROLOGY

Specimen required: **Serum (1 x SST)**
 Department: Referred test

CANNABINOIDS (THC)

See DRUGS of ABUSE

CARBAMAZEPINE (TEGRETOL)

Specimen required: 1 x **Lithium Heparin- Taken immediately prior to next dose.**
 Department: Biochemistry
 Results: Therapeutic Range: 4 - 10 mg/L
 Peak level: 6 - 12 hours after oral administration.
 Half Life: 10 - 30 hours.
 Comment: 1. This drug induces its own metabolism.
 2. Tolerance may develop to the anti-epileptic effect.

CARBOHYDRATE DEFICIENT TRANSFERRIN (CDT)

Specimen required: **Serum (1 x SST). Separate and freeze as soon as possible.**
 Department: Referred Test

CARBON MONOXIDE

SEE CARBOXY HAEMOGLOBIN (BELOW)

CARBOXY HAEMOGLOBIN

Specimen Required: As Carboxy Haemoglobin is very labile – Perth patients should be referred directly to QEII Specimen Collection. Bunbury patients should have 1 x lithium Heparin collected
 Department: Referred test
 Comment: Test performed at QEII Haematology Department. Sample collection should immediately follow any possible CO poisoning.

CARCINO-EMBRYONIC ANTIGEN (CEA)

Specimen required: **Serum (1 x SST)**
Department: Biochemistry
Reference range: < 5.0 ug/L
Interpretation: HIGH - Colorectal and other GI carcinomas, thyroid carcinoma, lung carcinoma, heavy smokers

CARDIAC ENZYMES (CE)

TEST SUPERSEDED BY TROPONIN T, however if requested collect **Serum (1 x SST)**

CARDIAC MUSCLE ANTIBODY

Specimen required: **Serum (1 x SST)**
Department: Referred test
Note: History please

CARDIOLIPIN ANTIBODY IGM & IGG (ACA / ACLA)

See ANTI CARDIOLIPIN ANTIBODY (NEW NAME)

CARNITINE

Specimen required: **Serum (1 x SST)**
Department: Referred test
Note: Centrifuge within 4 hours of collection. Test run infrequently at PMH

CAROTENE

Specimen required: **Serum (1 x SST) – Protect from light by wrapping with aluminium foil**
Note: Attach process immediately sticker
Department: Referred test
Reference range: As stated on the report
Interpretation: HIGH – Carotenemia.
LOW – Malabsorption.

CATECHOLAMINES

See ADRENALINE/ NORADRENALINE

CAT SCRATCH FEVER SEROLOGY (BARTONELLA HENSELAE)

Specimen required: **Serum (1 x SST)**
Department: Referred test

CCP

See ANTI CYCLIC CITRULLINATED PEPTIDE

CD4 / CD8 RATIO

See IMMUNOPHENOTYPING

CD MARKERS

See IMMUNOPHENOTYPING

CEA

See CARCINO – EMBRYONIC ANTIGEN

CELL FLOW CYTOMETRY

See IMMUNOPHENOTYPING

CERULOPLASMIN

See Caeuloplasmin

CERVICAL SMEAR

See CYTOLOGY SPECIMENS

CERVICAL SWAB

See GENITAL SPECIMENS

CF GENE

See GENETIC DISORDERS

CH50Specimen required: **Serum (1 x SST)**

Department: Referred test

Note: **Collect at Main Laboratory ONLY, sample requires separating and freezing on collection.****CHAGAS DISEASE**

See TRYPANOSOMIASIS

CHICKEN POX TESTS

See VARICELLA

CHLAMYDIA DNA DETECTION (BY POLYMERASE CHAIN REACTION -PCR)Specimen collection: **Men:** *First void urine (FVU)* (preferably the first of the morning) is as sensitive as a swab.**Women:** *Endocervical canal swab (dry)* for PCR is the most sensitive test. If not feasible, then *first void urine* is acceptable. *Thin prep* testing is also acceptable and is more sensitive than urine. A self collected low vaginal swab (SOLVS) may be more sensitive than a first void urine in women.

Department: Microbiology

Results: Results are expressed as Detected or Not Detected.

Note: Timing of Tests: If recent exposure suspected repeat PCR tests 3-6 weeks after estimated exposure. For individuals who are partners of proven Chlamydia infection initial PCR test may be negative. These individuals will benefit from prophylaxis regardless of the Laboratory result i.e. give Azithromycin 1g stat po**Comment:** Chlamydia DNA testing can detect both viable and non-viable organisms, hence should be performed at least three weeks after treatment of chlamydia infection for proof of cure testing, if needed.**CHLAMYDOPHILA (PREV CHLAMYDIA) PNEUMONIAE SEROLOGY (IGG ANTIBODIES)**Specimen required: **Serum (SST)**

Department: Referred test

Comment: Adults will often have antibody from past infection. To prove recent infection, 2 sera collected at 10 days apart are required, except for children under 5 years of age. Can be performed as part of atypical respiratory serology but must be specifically requested.**CHLAMYDIA PSITTACI SEROLOGY**

See PSITTACOSIS SEROLOGY

CHLAMYDIA TRACHOMATIS SEROLOGY**Comment:** PCR is the test of choice because it is much more sensitive. Contact Laboratory for further information.

Department: Referred test

CHLAMYDIA SEROLOGY (IGA & IGG ANTIBODIES)

see LYMPHOGRANULOMA VENEREUM TESTS.

CHLORIDE (CL)

Specimen required: **Serum (1 x SST)**
 Department: Biochemistry
 Reference range: 95 - 108 mmol/L
 Interpretation: HIGH - Hyponatraemia, metabolic acidosis (normal anion gap), respiratory alkalosis.
 LOW - Hyponatraemia, metabolic alkalosis, respiratory acidosis, vomiting, diarrhoea.

CHOLESTEROL – TOTAL

Specimen required: **Serum (1 x SST) - Fasting preferred.**
 Department: Biochemistry
 Health Range: < 5.5 mmol/L
 Interpretation: HIGH - Primary (familial)
 - Secondary e.g.: hypothyroidism nephrotic syndrome.
 Comment: Non-fasting cholesterol specimen may increase total cholesterol result by up to 0.5 mmol/L.

CHOLESTEROL – HDL

Specimen required: **Serum (1 x SST) - Fasting preferred.**
 Department: Biochemistry
 Reference range: 1.1 - 3.5 mmol/L
 Interpretation: LOW - Increased risk of atherosclerosis and coronary artery disease.
 HIGH - Lower risk of atherosclerosis.
 Comment: (i) The ratio of total cholesterol to HDL cholesterol (coronary risk ratio or CRR) is the best prognostic marker.
 (ii) Desirable risk ratio is 3.5. The higher the ratio, the poorer the prognosis.
 (iii) According to Medicare Australia, a request for LIPID PROFILE should be interpreted as cholesterol and triglycerides ONLY. A specific written request for HDL must be made e.g. Lipids + HDL.
 (iv) Please ask the patient if they are on lipid lowering drugs, and note down the name of the medication

CHOLINESTERASE (PLASMA OR RED CELL OR GENOTYPE)

Specimen required: **1 x Heparin NO GEL Note: Collect 2 x Li Hep in Bunbury**
 Department: Referred test
 Reference range: As stated on report
 Interpretation: RED CELL CHOLINESTERASE (TRUE CHOLINESTERASE)
 Useful in organic phosphorus poisonings.
 SERUM CHOLINESTERASE (PSEUDOCHOLINESTERASE)
 LOW Poisoning with organophosphorus compounds. Patients with scoline sensitivity usually have low levels, (% inhibition with fluoride and dibucaine numbers necessary for phenotyping).
 Liver damage.

CHROMATOGRAPHY (AMINO ACID)

See AMINO ACID SCREEN

CHROMIUM

Specimen required: **2 x Trace Element (Royal blue top K₂EDTA)**
 Department: Referred test
 Reference range: As stated on report

CHROMOGRANIN A

Specimen required: **Serum (1 x SST). Spin and freeze.**
 Department: Referred test

CHROMOSOME STUDIES

See CYTOGENETICS

CHORIONIC GONADOTROPIN

See HUMAN CHORIONIC GONADOTROPHIN

CITRATE

Specimen required: **24hr urine with 20mL 50% HCL** (Warn patients of the acid danger)

Department: Referred test

CK

See CREATINE KINASE

CLOBAZAM

Specimen required: **1 x Heparin NO GEL** Collect PRE-DOSE sample (Trough).

Department: Referred test

Reference range: As stated on report

CLOMIPRAMINE

Specimen required: **Serum (1 x SST) only if URGENT specimen. Collect PRE-DOSE sample (Trough).**
1 x Heparin no Gel if non-urgent.

Department: Referred.

Therapeutic Range: As stated on report

Interpretation: Tricyclic antidepressant.

CLONAZEPAM

Specimen required: **1 x Heparin NO GEL**

Department: Referred

Therapeutic Range: As stated on report

Interpretation: Benzodiazepine

CLOSTRIDIUM DIFFICILE (CULTURE & TOXIN)

Specimen required: **Faeces sample**

Please refrigerate sample if delay in transport.

Department: Referred test

CLOZAPINE

Specimen required: **1 x Heparin NO GEL . Collect PRE-DOSE sample (Trough).**

Department: Referred

Therapeutic Range: As stated on report

Comment: Often collected in parallel with FBC to check white cell count (WCC). The WCC may be reduced as a side effect of this drug and if requested should be marked as URGENT.
Results >1000_µg/L correlate to increased seizures.

CFI SKIN TESTS (CELL MEDIATED IMMUNITY)

TEST NO LONGER PERFORMED

CMV (CYTOMEGALOVIRUS)

See CYTOMEGALOVIRUS

COAGULATION SCREENING PROFILE

Specimens Required: **1 x Na Citrate tube . Collect 2 x Na Citrate in Bunbury
1 x EDTA**

Department: Haematology
 Profile consists of: PROTHROMBIN TIME (PT)
 PARTIAL THROMBOPLASTIN TIME (APTT)
 THROMBIN CLOTTING TIME (TCT)
 PLATELET COUNT (PT)
 FIBRINOGEN (FIB)

NOTE: Medicare Australia does NOT consider Platelet Function as part of the Coagulation Profile so the test must be specifically requested. If Platelet Function is also requested, collect an extra Na Citrate tube, and do not spin.

COCAINE METABOLITES

See DRUGS of ABUSE

COELIAC DISEASE SEROLOGY (COELIAC SCREEN)

See TISSUE TRANSGLUTAMINASE (TTG IGA) ANTIBODIES

CO-ENZYME Q10

Specimen Required: **1 x HNG Spin separate and freeze in foil**
 Department: Referred
 Comment: This is a non-rebatable test and patients will receive a private account

COELIAC DISEASE GENOTYPING

See HLA DQ2/8

COLD ANTIBODY TITRE (COLD AGGLUTININS)

Specimen Required: **1 x EDTA and 1 x Clot (No Gel) – Do NOT Refrigerate & MUST be spun at 37 degrees**
 Department: Haematology & Australian Red Cross Blood Service
 Interpretation: High titres in cold antibody diseases (e.g. mycoplasma or EBV infection, lymphoma)

COLON / RECTUM / BOWEL TUMOUR MARKERS

See CA19-9 CEA

CONJUNCTIVAL SWAB

Specimen: **Gel swab for bacteria**
Dry swab for viral PCR e.g. Adenovirus, HSV, Varicella (Referred test)
Dry swab for Chlamydia
 Department: Microbiology

COMPLEMENT LEVELS (C3 , C4)

Specimen required: **Serum (1 x SST)**
 Department: Immunology
 Reference range: C3: 0.55 - 1.20 g/L
 C4: 0.15 - 0.40 g/L
 Interpretation: Serum levels may be low in SLE and some other connective tissue diseases, some types of glomerulonephritis and cryoglobulinaemia.
 Comment: Useful in following progress of SLE.

COMPLEMENT C1q

Specimen Required: **1 x SST**
 Department: Referred
 Note: Separate and freeze ASAP

COOMBS TEST (DIRECT ANTI-HUMAN GLOBULIN OR DAT)

Specimen Required: **1 x EDTA**
Department: Haematology
Interpretation: Positive in isoantibody and autoimmune haemolytic anaemia (HA) and drug induced HA.

COOMBS TEST (INDIRECT)

Specimen Required: **1x EDTA**
Department: Haematology
Interpretation: Not in common usage: Tested as part of a cross match or maternal antibodies. Refer enquiries to Haematology.

COPPER (Cu)

Specimen required: **2 x Trace Element (Royal blue top K₂EDTA)**
Department: Referred
Reference range: 11 - 23 μ mol/L.
Interpretation: HIGH - Inflammation
LOW - Wilson's disease
Note: If **urinary copper** is requested please provide patient with a 24hr collection bottle – no additive

COPROPORPHYRIN

See PORPHYRINS SCREEN

CORONA VIRUS

See SARS virus

CORTISOL (BLOOD)

Specimen required: **Serum (1 x SST)**
Department: Biochemistry
Reference range: AM (0800 - 0900): 171 - 536nmol/L
PM (1500 - 1600): 64 - 327 nmol/L
Interpretation: HIGH (Trend) - Cushing's syndrome, stress, fever, severe pain.
LOW (Trend) - Addison's disease, secondary to pituitary failure.
Note: Spot cortisol - **a single AM or PM cortisol estimation can be requested.** Morning and afternoon blood collection is only required when a doctor specifically asks for *both* AM and PM cortisol levels.
Comment: Cortisol is a stress hormone - one off high values should be treated with caution.

CORTISOL (URINARY FREE)

Specimen required: **24 hour urine - collection in a plain bottle (NO preservative).**
Department: Referred
Reference range: As stated on report
Interpretation: HIGH - Cushing's syndrome, hormone therapy.

COTININE

Specimen required: **Serum (1 x SST) - urine can also be tested, but serum is the preferred specimen**
Department: Biochemistry
Reference range: < 25 μ g/L (non-smokers)
Interpretation: Cotinine is a very specific marker for tobacco smoke.
NORMAL - Non-smokers.
HIGH - High in smokers.

COXSACKIE VIRUS (ONE OF THE ENTEROVIRUSES)

Specimen required: **Throat swabs (dry orange top swab) and faeces samples for PCR**
Department: Referred test
Indications: May include lethargy, fatigue, malaise, fever, rash, pharyngitis, pneumonia, meningitis, myopericarditis and conjunctivitis.
Consider also other enteroviruses and respiratory viruses including rhinovirus, coronavirus, influenza and para-influenzae virus, adenovirus and RSV.
Note: See also Hand, Foot, and Mouth disease, viral myocarditis and encephalitis. Diagnosis is by PCR from clinical specimens. Serum antibody test NOT available in WA and is not generally recommended. Please discuss with the clinical microbiologist if required.

COXIELLA BURNETII

see Q FEVER

C-PEPTIDE

Specimen required: **Serum (1 x SST) - Fasting preferred.**
Department: Biochemistry
Reference range: 0.4 - 1.5 nmol/L.
Comment: Indirect measurement of insulin secretion.

CREATINE KINASE (CPK , CK) TOTAL

Specimen required: **Serum (1 x SST)**
Department: Biochemistry
Reference range: Female: Less than 170 U/L
Male: Less than 195 U/L
Interpretation: HIGH - Myocardial Infarction, myopathy, exercise, Rhabdomyolysis.

CREATININE

Specimen required: **Serum (1 x SST)**
Department: Biochemistry
Reference range: Male: 62 - 115 μ mol/L
Female: 53 - 97 μ mol/L
Interpretation: HIGH - Acute or chronic renal insufficiency, high meat intake.
LOW - Small muscle mass e.g. muscular dystrophy.

CREATININE (URINE)

Specimen required: **Spot Urine- unless 24 hour urine requested by Doctor**
Department: Biochemistry
Reference range: Male: 7.1 - 17.7 mmol/day
Female: 5.3 - 15.9 mmol/L

CREATININE CLEARANCE

Specimen required: **Serum (1 x SST) plus a 24 hour Urine** (No preservative.)
The blood specimen may be collected before or after the urine collection.
Department: Biochemistry
Reference range: 70 - 150 mL/minute
Interpretation: LOW - Renal insufficiency.
Comment: Creatinine clearance performed on children below the age of 15 years must be accompanied by the child's HEIGHT, AGE and WEIGHT, in order to correct for body surface area.

CROSSMATCHING BLOOD FOR TRANSFUSION

Please check with Haematology before accepting X match for any site other than Murray St, West Perth

Specimen required: **1 x EDTA.**

1 x Clotted blood (NO GEL SERUM)

(2 x **Clotted** if more than 4 units required).

Department: Haematology

Note: Blood will NOT be accepted for grouping and crossmatching unless sample and request form are correctly labelled as per ANZBTS requirements – Phlebotomists must sign request form OR a signed X-match sticker **MUST** be attached to the original request form. Specimen tubes for X-match **MUST** be labelled with patient's full name and DOB and be signed by the phlebotomist.

At least 48 hours notice of crossmatch would be appreciated to ensure that compatible blood is available.

CRP, HIGH SENSITIVITY (hsCRP)

Specimen required: **Serum (1 x SST)**

Department: Biochemistry

Reference range: As stated on report

Comment: Should only be measured when clinically well; used to assess risk of coronary artery disease

C- REACTIVE PROTEIN (CRP)

Specimen required: **Serum (1 x SST)**

Department: Biochemistry

Reference range: < 5.0 mg/L

Interpretation: HIGH > 100 mg/L : Bacterial infection, vasculitis
20 – 100 mg/L : RA, viral illness, malignancy and other inflammatory processes.
< 10 mg/L : Atherosclerosis, degenerative joint disease.

Comment: Non-specific test, but usually indicates organic disease. ESR may be more useful in monitoring SLE and ulcerative colitis response to treatment.

CRYOGLOBULINS

Specimen required: **Serum (1 x SST) and 1 x Heparin NO GEL. Collection at the MAIN LABORATORY ONLY.**

Sample requires special processing, tubes must be pre-warmed and kept at 37°C

Reference range: Not detected.

Interpretation: Cryoglobulins are either monoclonal immunoglobulins (type 1 cryoglobulinaemia) or immune complexes (type 2 and 3 cryoglobulinaemia). Type 2 or 3 cryoglobulins are usually associated with SLE or another connective tissue disease, or with chronic infections, particularly hepatitis C virus infection.

CRYPTOCOCCAL ANTIGEN

Specimen required: **Serum (1 x SST) or CSF**

Department: Referred test

CSF EXAMINATION

Specimen required: **Sterile CSF sample. Urgent-Microbiologist to be notified ASAP
Should ideally have three bottles**

Department: Microbiology for cell count and culture **(two samples marked #1 #2)**

Biochemistry for glucose and protein estimation (Fluoride oxalate bottle)

Note: Additional tests may be needed e.g. Herpes, enterovirus. Menigococcal PCR

CYANIDE

Specimen required: **1 x Lithium Heparin**

Department: Referred test

Reference range: As stated on report.

Comments: This test attracts a \$70.00 up front cost.

CYCLOSPORIN - A

Specimen required: **1 x EDTA**
Department: Referred test
Reference range: As stated on report.
Note: Sample 12 hours post dose, preferably in morning.

CYCLOSPORIN – A, C2

Specimen required: **1 x EDTA**
Department: Referred test
Reference range: As stated on report.
Note: Sample must be taken exactly 2hrs post dose.

CYSTICERCOSIS

See TAENIA SEROLOGY (TAPEWORM)

CYSTIC FIBROSIS GENE

See GENETIC DISORDERS

CYTOGENETIC AND FISH TESTING

Specimen Required:

1. Amniotic fluid chromosome study

Ideally 2 to 3 sterile tubes (10mL size) containing a total of 20-25mL of fluid, but may be collected into any sterile container (available from Clinipath Pathology). Transport to the Laboratory as soon as possible at room temperature or cool but NOT FROZEN.

2. Chorionic villus biopsy chromosome study

Ideally 20-30mg of chorionic villus tissue is collected into a sterile container containing (bone marrow and tissue) transport medium or another sterile salt solution (available from Clinipath Pathology). Transport to the Laboratory as soon as possible (same day) at room temperature or cool but NOT FROZEN.

3. Foetal blood chromosome study

Ideally 1ml of foetal blood collected into a sterile lithium heparinized tube (green top) is required (tube available from Clinipath Pathology). Transport to the Laboratory as soon as possible at room temperature or cool but NOT FROZEN.

4. Foetal tissue / Products of conception chromosome study

Collect into a sterile container. Keep specimen wet in a sterile isotonic solution, for example bone marrow transport media, sterile saline, or viral transport media (available from Clinipath Pathology). Transport to the Laboratory as soon as possible at room temperature or cool NOT FROZEN. SPECIMEN MUST NOT BE PUT IN FORMALIN. For intrauterine foetal death and stillbirth specimens, collect placental tissue (preferably chorionic villi), umbilical cord and foetal skin where possible.

5. Bone marrow chromosome study

Approximately 1ml of bone marrow aspirate is collected into a bone marrow transport medium tube (available from Clinipath Pathology). Transport to the Laboratory as soon as possible at room temperature or cool but NOT FROZEN.

6. Peripheral blood chromosome study

A minimum of 4ml of Lithium heparinized whole blood is required for adults, 2-4ml is sufficient for infants/young children (tubes available from Clinipath Pathology). Transport to the Laboratory as soon as possible at room temperature or cool but NOT FROZEN.

NOTE: Due to special processing requirements, **cytogenetic samples** cannot be collected the day before a long weekend.

7. Malignant tissue chromosome study

A portion of the tissue of interest is dissected off as aseptically as possible. Ideally, this should be pea sized or larger. The specimen is placed in a bone marrow transport medium tube (available from Clinipath Pathology) which has been completely thawed to room temperature, and it is then to be transported to the Laboratory at room temperature or cool but NOT FROZEN. Please note: The nature of the specimen and suspected diagnosis must be clearly stated on the request form.

8. Skin fibroblast chromosome study

A skin biopsy is taken by excision or punch biopsy, and placed into bone marrow and tissue transport medium (available from Clinipath Pathology). It is then transported to the Laboratory at room temperature or cool but NOT FROZEN.

9. Fluorescent in-Situ Hybridization Studies (FISH tests)

Prenatal interphase FISH tests –

As for the amniotic fluid chromosome study except collect an extra 5ml if possible.

As for chorionic villus biopsy chromosome study.

Constitutional FISH tests –

Depending upon the clinical context, please submit samples as per the cytogenetic specimen protocol.

Oncology FISH tests –

Samples depend upon the tumour type - peripheral blood, bone marrow or tumour. Please submit samples as per the cytogenetic specimen protocol. Paraffin section studies are also now available.

For more information CONTACT CLINIPATH PATHOLOGY 9476 5222 or BUNBURY PATHOLOGY 08 9780 0333

Department: Cytogenetics SNP (Result Enquiries phone 9476 5252)

Note: **DO NOT PUT ANY SPECIMENS IN FORMALIN or FREEZE Samples**

Turnaround Times:	Prenatal Cord Blood	- 48 hours (preliminary), 4 days final report
	Chorionic Villi	- 10-15 days
	Blood/Amniotic Fluid/Bone Marrow	- 10-15 days
	Tissue biopsies/POC/Tumour	- approx 2-3 weeks

CYTOGENETIC AND FISH TEST LIST

Cytogenetic Tests	Oncology FISH tests
Amniotic fluid chromosome study	Acute lymphocytic leukaemia t(12;21)
Chorionic villus biopsy chromosome study	Acute non-lymphocytic leukaemia t(8;21)
Foetal blood chromosome study	Acute non-lymphocytic leukaemia M4- Inv(16)
Foetal tissue / Products of conception chromosome study	Acute promyelocytic leukaemia – t(15;17)
Bone marrow chromosome study	C-MYC amplification
Peripheral blood chromosome study	Chronic lymphocytic leukaemia (CLL) panel
Malignant tissue chromosome study	Chronic myeloid leukaemia t(9;22) bcr/abl fusion
Skin fibroblast chromosome study	Chronic myeloid leukaemia (9q34) bcr/abl fusion with 9q deletion
	Deletion 5q
Prenatal FISH tests	Deletion 7q
IVF single cell preimplantation genetic diagnosis (PGD)	Deletion 20q
Prenatal interphase FISH	EGFR 7p12
	Ewings sarcoma t(11,22)
Constitutional FISH tests	HER-2/neu amplification
1p36 microdeletion	Lymphoma panel
Cri Du Chat syndrome	Lymphoma (Burkitt, t(8;14))
Di George / Shprintzen / Velocardiofacial syndrome	Lymphoma t(14;18)
Kallmann syndrome	Lymphoma MALT1 18q21 rearrangement
Miller-Dieker syndrome	Mantle cell lymphoma t(11;14)
Prader-Willi syndrome	M-FISH
Smith-Magenis syndrome	Myxoid liposarcoma 12q13 rearrangement
SRY locus	MLL 11q23 rearrangement
Subtelomere FISH	Multiple myeloma panel
Urgent neonate (eg sex chromosome determination and aneuploidy confirmation)	N-MYC amplification
Whole chromosome paints	Oligodendroglioma – 1p,19q
Williams syndrome	Oligodendroglioma-PTEN 10q23 deletion
Wolf-Hirschhorn syndrome	Sex Mismatch bone marrow transplant
XY sex chromosomes	Synovial sarcoma t(X;18)
	Trisomy 8

CYTOLOGY (Gynaecological & Non-Gynaecological)

Specimens Required: **See listings below for Cervical Smears, Sputum, Urine, FNA, Nipple discharge, Other Body Fluids.**

Department: Cytology

See also: THIN PREP, HPV DNA Testing

CONVENTIONAL CERVICAL SMEARS

Specimens Required: Fix cervical sample smeared on a glass slide.

The Pap smear is a screening test to aid in the detection of abnormal cells in the cervix. It is a requirement that the glass slides containing the cervical sample are labeled with the patient's full name and date of birth. To enable the meaningful reporting of gynaecological cytology, full information including Clinical history such as parity, menstrual dates and hormonal status is desirable as well as previous gynaecological history and results. Patients should be advised not to have smears taken during active menstruation.

For more detailed collection procedures please phone the Cytology Department and speak with a cytotechnologist/or Pathologist in the Main Laboratory. Medical Liaison can also be contacted for additional written information.

Collection Conventional Pap smear slides should be prepared first, prior to preparing the ThinPrep specimen. When taking the smear, lubricants, other than water should be avoided. Extended tip spatulas, e.g. Aylesbury in conjunction with an endocervical brush (cytobrush), give satisfactory samples. Material obtained using these two devices can be mixed on one slide and submitted to the Laboratory. The broom type devices such as the Cervex brush are also suitable and should preferentially be used for collecting ThinPrep specimens. Pap kits made to the physician's requirements are available from the Laboratory. Once the sample has been placed on the slide, fix the slide with cytofix immediately. Hold the cytofix 10-15cm away from the glass slide and give 2 short sprays. **Label the glass slide with the patient's surname and first name and date of birth with pencil.** (ink washes off during processing). Close the carrier; ensuring the slide is secured by fastening all the clips on the carrier. Place the slide carrier in a biohazard bag (available from the Laboratory) with the request form. Request Pap, Pap + ThinPrep, Vault, Vault + ThinPrep on the request form. Indicate if the patient does not want her results sent to the W.A. Cervical Cancer Registry. Unless indicated NOT FOR PAP REGISTRY all results from this Laboratory are automatically downloaded to the CCR. This information is protected by PGP encryption.

THINPREP SPECIMENS

Specimen required: **Cervical sample in ThinPrep collection vial** (ThinPrep vials available on request from Laboratory)

Note: Currently the split sampling technique is employed within this Laboratory, which involves the analysis of both the conventional smear and the ThinPrep specimen. The ThinPrep specimen is not routinely processed without a conventional slide.

Collection: Collect the sample using a Cervex brush, available from the Laboratory
Transfer the sample to the glass slide by smearing down the glass slide with one side of the brush, and then the other. Fix the slide immediately with a spray fixative.
Rinse the cervex brush in a vial of preservative fluid and discard.

Note: The end of the Cervex brush should not be left in the vial once rinsed.

Label the glass slide and the ThinPrep vial with the patient's surname, first name and date of birth. Send prepared slide and ThinPrep vial to the Laboratory for analysis.

Results Negative results are available within 48 hours. Abnormal results are available in 48-72 hours. If the cervical cytology result is required urgently please mark this on the request form along with the date and time the result is required by. Urgent tests will be processed immediately and the results will be available within 4 hours of the receipt of the specimen in the Laboratory. (Please allow additional time if specimen received after hours or on the weekend) Urgent results can be phoned, faxed or electronically downloaded as required.

SPUTUM

Specimens required: **3 x early morning specimen of sputum** in yellow top jar (Preservative free)

Lesions within the respiratory tract cause irritation, which can result in excess sputum production and haemoptysis (blood in the sputum). The cells lining the respiratory tract are constantly shed into the sputum. Deep coughing by the patient can expectorate the sputum containing these cells. If there is a lesion within the respiratory tract, analysis of these cells can detect it. The method of collection is most important for meaningful results. Three consecutive early morning deep cough specimens are required, preferably before food. Yellow-topped 50ml plastic containers are available from the Laboratory to collect specimens. A list of instructions for the patient can also be provided.

Collection: Before breakfast, the patient should rinse their mouth with water, cough lightly and spit out any saliva.

The patient should then take a deep breath and cough as vigorously as possible, spitting the sputum into the container.

The container should be labelled with the patient's full name, date of birth, date and time of collection and placed in a fridge until it is taken to the collection centre.

A separate container should be used each day and each container taken to the collection centre each day. As each container arrives at the collection centre it should be labeled with a laboratory ID number. All three specimens should have the same laboratory ID number.

Results: Results are available within 24 hours. If the Cytology result is required urgently please mark this on the request form along with the time the results are required. Urgent tests will be processed immediately and the results will be available within 4 hours of the receipt of the specimen in the Laboratory. (Please allow additional time if specimen received after hours or on the weekend) Urgent results can be phoned, faxed or electronically downloaded as required.

URINE CYTOLOGY

Specimens Required: **3 x early morning urine samples**. Special containers are available from the Laboratory.

Note: Lesions within the urinary tract cause irritation that can result in frequency of urination and haematuria (blood in the urine). The cells lining the urinary tract are constantly shed into the urine stored in the bladder and voided from the body. If there is a lesion within the urinary tract, analysis of these cells can detect it.

Collection: Specimen is required to be collected in a 200ml white screw top wide mouthed jar - labelled Urine for Cytology. It is preferable to collect the specimens on **three** consecutive mornings. **Collect the second specimen of the day**. The first specimen of the morning should not be collected because there will be cell autolysis. Collect half the jar or at least 50mL of specimen. After collection the specimen must be refrigerated and sent to the Laboratory as a PRIORITY specimen. Delay may affect the specimen quality.

The container should be labelled with the patient's name, date of birth, referring doctor, the date and the time collected.

Specimen 1, 2 or 3 should be selected on the label.

This should be performed on three consecutive mornings and the specimen brought to the collection centre each morning.

Results: Results are available within 24 hours. If the Cytology result is required urgently please mark this on the request form along with the date and time the result is required. Urgent tests will be processed immediately and the results will be available within 4 hours of the receipt of the specimen in the Laboratory. (Please allow additional time if specimen received after hours or on the weekend) Urgent results can be phoned, faxed or electronically downloaded as required.

FNA – ASPIRATION CYTOLOGY (BREAST, THYROID, ETC)

- Specimen required:** Prepared slides, any additional material obtained (e.g. needle washings) can be rinsed in saline, placed in a yellow topped jar and sent to the laboratory to be made into extra slides or cell blocks. Specimens that are fluid in nature should be placed in a yellow topped jar and sent to the Laboratory as soon as possible.
- Collection:** Label the slides with the patient's full name (First and surname) and date of birth in pencil.
A full clinical history on the request form will aid in a meaningful diagnosis. A full description of the aspirated lesion, including the site should be written on the request form.
- Note:** If you regularly perform Fine Needle Aspirates, a more detailed protocol is available from the Cytology Department.
An aspiration service is conducted on Thursday afternoons and appointments can be made by phoning the MAIN LABORATORY. Same day referral may be available for urgent patients. A report is usually available four (4) hours after the procedure is completed.
- Results:** For submitted FNA's, results are available within 24 hours. If the Cytology result is required urgently please mark this on the request form along with the date and time the result is required. Urgent tests will be processed immediately and the results will be available within 4 hours of the receipt of the specimen in the Laboratory. (Please allow additional time if specimen received after hours or on the weekend) Urgent results can be phoned, faxed or electronically downloaded as required.

NIPPLE DISCHARGE

- Specimen required:** **Prepared slides (air dried and/or fixed)**
Lesions occurring within the breast tissue can sometimes result in a nipple discharge; sampling of this discharge can yield cells diagnostic of the existing condition.
- Collection:** Where possible the discharge should be expressed directly on to a glass slide.
An air-dried and fixed slide is appreciated where possible. The fixed slide should be sprayed with cytofix immediately upon collection. Label the slide with the patient's surname and first name, date of birth and L or R breast. A full clinical history on the request form will aid in a meaningful diagnosis.
- Results:** Results are available within 24 hours. If the Cytology result is required urgently please mark this on the request form along with the date and time the result is required. Urgent tests will be processed immediately and the results will be available within 4 hours of the receipt of the specimen in the Laboratory. (Please allow additional time if specimen received after hours or on the weekend) Urgent results can be phoned, faxed or electronically downloaded as required.

BODY FLUIDS

- Specimen required:** **Collect any fluid in a yellow top 50ml container (preservative free), or a larger container if necessary.** These include Peritoneal, Pleural & Pericardial fluid, Ovarian Cyst fluid, Synovial Fluid, Pouch of Douglas etc. Label the container with the patient's surname and first name, date of birth and type of fluid collected. A full clinical history on the request form will aid in a meaningful diagnosis.
Transport as soon as possible to the Laboratory. If delay occurs, specimen should be REFRIGERATED.
- Results:** Results are available within 24 hours. If the Cytology result is required urgently please mark this on the request form along with the date and time the result is required. Urgent tests will be processed immediately and the results will be available within 4 hours of the receipt of the specimen in the Laboratory. (Please allow additional time if specimen received after hours or on the weekend) Urgent results can be phoned, faxed or electronically downloaded as required.

Throat SmearSpecimen required: **Fixed Smear**

Collection: Collect the sample with a spatula/ tongue depressor and place onto a glass slide. Fix with cytofix immediately. Label the slide with the patient's surname and first name, date of birth in pencil.

Results: Results are available within 24 hours. If the Cytology result is required urgently please mark this on the request form along with the date and time the result is required. Urgent tests will be processed immediately and the results will be available within 4 hours of the receipt of the specimen in the Laboratory. (Please allow additional time if specimen received after hours or on the weekend) Urgent results can be phoned, faxed or electronically downloaded as required.

CYTOMEGALOVIRUS (CMV)**CMV SEROLOGY (CYTOMEGALOVIRUS SEROLOGY) IGG & IGM**Specimen required: **Serum (1 x SST)**

Department: Serology

Results: Reported as Detected/ Not Detected with appropriate interpretative comments.

Symptoms: May include fever, lethargy, and atypical lymphocytosis and is an important cause of congenital infection. Can cause severe infection in the immunosuppressed patient.
Consider also EBV or Toxoplasmosis.**CMV AVIDITY TESTS**Specimen: **Serum (1 x SST)**

Department: Referred test

Comment: Specialised test for pregnant women with CMV IgM+

CMV PCRSpecimen: **Urine, throat swab or sputum or whole blood
2 x EDTA, dedicated tubes.**

Department: Referred test

CMV VIRAL LOADSpecimen: **2 x EDTA, dedicated tubes.**

Department: Referred test