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 K$_2$EDTA) / 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

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

CH50
Specimen 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 - Hypernatraemia, 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.

CMI 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: 1 x 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 µmol/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 µg/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 ENTEROVIRUSSES)
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 μmol/L
Female: 53 - 97 μmol/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, entrovirus. 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
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<tr>
<td>Miller-Dieker syndrome</td>
<td>Mantle cell lymphoma t(11;14)</td>
</tr>
<tr>
<td>Prader-Willi syndrome</td>
<td>M-FISH</td>
</tr>
<tr>
<td>Smith-Magenis syndrome</td>
<td>Myxoid liposarcoma 12q13 rearrangement</td>
</tr>
<tr>
<td>SRY locus</td>
<td>MLL 11q23 rearrangement</td>
</tr>
<tr>
<td>Subtelomere FISH</td>
<td>Multiple myeloma panel</td>
</tr>
<tr>
<td>Urgent neonate (eg sex chromosome determination and aneuploidy confirmation)</td>
<td>N-MYC amplification</td>
</tr>
<tr>
<td>Whole chromosome paints</td>
<td>Oligodendroglioma – 1p,19q</td>
</tr>
<tr>
<td>Williams syndrome</td>
<td>Oligodendroglioma-PTEN 10q23 deletion</td>
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<tr>
<td>Wolf-Hirschhorn syndrome</td>
<td>Sex Mismatch bone marrow transplant</td>
</tr>
<tr>
<td>XY sex chromosomes</td>
<td>Synovial sarcoma t(X;18)</td>
</tr>
<tr>
<td>Trisomy 8</td>
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</tbody>
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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 Smear
Specimen 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 PCR
Specimen: Urine, throat swab or sputum or whole blood
2 x EDTA, dedicated tubes.
Department: Referred test

CMV VIRAL LOAD
Specimen: 2 x EDTA, dedicated tubes.
Department: Referred test