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# CLINICAL BIOCHEMISTRY REFERENCE RANGES HANDBOOK

Eastbourne District General Hospital  
&  
Conquest Hospital, Hastings

Version:	Issue 14 V2.2
Ratified by:	Clinical Biochemistry Team
Date ratified:	April 2020
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Date Written:	November 2011
Name of responsible committee/individual:	Jacqueline Munro, Lead BMS
Date issued:	April 2020
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## Version Control Table

Version number and issue number	Date	Author	Reason for change	Description of changes made
V1	November 2011	Biochemistry Clinical Team		
V1.0 (Biochemistry Issue 2) 2013176	August 2013	Paul Eaton		
V1.1	November 2013	Paul Eaton	General Updates	Reference ranges changed to reflect current practice
V1.2	January 2015	Sue Fuggle	UKAS Requirement	Add source of reference ranges
V1.3	April 2015	Sue Fuggle	General update	Add U. Magnesium Remove U. Amylase
V1.4	March 2017	Sue Fuggle	Update – analyser change	Reference ranges changed to reflect current practice
V1.5	July 2017	Sue Fuggle	Corrections	Carbamazepine (CBZ) reference range corrected < inserted in rr for alb:cr ratio < removed for Dehydroepiandrosterone S04
V1.6	July 2017	SueFuggle	corrections	Male 17 B ref range updated
V1.7	Aug 2017	Sue Fuggle	corrections	'driving' inserted to alcohol. Unit correction for neonatal copper..Carbonmomoxide and non fasting Glucose added. Random glucose updated Group name and contact phone numbers
V1.8	Aug 2018	Sue Fuggle	Corrections	Carboxyheamoglobin reference range updated and reference inserted. Cadmium/Chromium corrected. Cobalt added
V1.9	Dec 2018	Sue Fuggle	Viapath changes	Update of reference range where applicable for those samples now referred to Viapath
V2.0	May 2019	Sue Fuggle	Unit/ref range updates	LDH/Folate change of reference range. Ferritin : change of units
V2.1	October 2019	Sue Fuggle	PTH sample type	PTH sample type changed from serum to plasma.
V2.2	April 2020	Sue Fuggle	Addition of Procalcitonin	Test and interpretative guide added.
<b>V2.3</b>	<b>June 2020</b>	<b>Sue Fuggle</b>	<b>CGA changed to B</b>	<b>Error in naming rectified.</b>

## Consultation Table

This document has been developed in consultation with the groups and/or individuals in this table

Name of individual or group	Title	Date
Joint Quality and Governance Group		2015

### DEPARTMENT OF CLINICAL CHEMISTRY TESTS

#### KEY

**Specimen Type:**

- S** – Serum
- U** – Urine
- BI** - Whole Blood (EDTA)
- P** – Plasma
- F** – Faeces
- BS** – Blood Spot

ACD/AED: anticonvulsant drug / anti epileptic drug

**Location and reference range :**

- Lab** - Daily routine tests
- Lab\*** - Batches
- POCT** – Point of Care Testing
- REF-** Referral to other hospitals including use referral lab's reference range
- Note turn around time for tests referred to another hospital is 4 weeks or less unless specifically stated.
- GOS** – paediatric reference ranges obtained from Great Ormond Street Hospital .
- KIT** - reference range obtained from manufacturer's instructions for use.
- H-** Pathology Harmony Reference Range
- GSTS** – Guys and St Thomas' Hospital
- N/A** - Not applicable
- Not available
- W** – All Wales Clinical Biochemistry Audit group.
- Source 1 – The Prescriber Vol 25, Issue 20, Version of record online:30 Oct 2014
- T** – Trust policy
- N** – NHS Diabetes prevention programme.

TEST NAME	REFERENCE RANGES	SOURCE
<b>11 deoxycortisol (S)</b>	<7.2 nmol/L	Ref
<b>17 Alpha Hydroxyprogesterone (S)</b>		Ref
Adult 16 years and older	0-5 nmol/L results may be higher in luteal phase (see report)	
Neonates 0-5 days	0-3 nmol/L	
5 days - 16 years	0-4 nmol/L	
Post 250 ug Synacthen stimulation	Normal: <10 nmol/L at 30 mins	

<b>17 Beta Oestradiol (S)</b> Post Menopausal Follicular Mid-Cycle Luteal Males	<18.4 - 505 pmol/L 45 - 854 pmol/L 151 - 1462 pmol/L 82 - 251 pmol/L 41 - 159 pmol/L	Lab KIT
<b>3 methoxytyramine (U)</b>	< 2.6 umol/24h	Ref
<b>3 methoxytyramine (P)</b>	0 – 120 pmol/L	
<b>5HIAA (U)</b>	0 - 42 µmol/24h	Ref
<b>ACTH (PI)</b>	<46 ng/L (9 am) <10 ng/L (midnight)	Ref
<b>Albumin (S)</b>	Age g/L Neonate 30 - 45 Infant 30 - 45 1-16 yrs 30 - 50 >15Y 35 - 50	Lab H H
<b>Albumin: creatinine ratio (U)</b>	<2.3 mg/mmol	KIT
<b>Alcohol (S)</b> (Ethanol, C <sub>2</sub> H <sub>5</sub> OH)	The legal driving limit is 80 mg/100ml. Coma ensues at 300-400 mg/100ml. Death may occur at levels over 450 mg/100ml.	Lab KIT
<b>Aldosterone (PI)</b>	Upright 100 - 800 Supine 5.4 - 30 pmol/L Aldosterone/Renin ratio <80 Conn's unlikely >/=200: Conns' likely 80-200: Conn's not excluded	Ref
<b>Alk Phos Isoenzymes (S)</b>	Text report	Ref
<b>Alkaline Phosphatase (S)</b>	<b>Age U/L</b> Neonate 70 - 380 Infant 60 - 425 >15y 30 - 130 (M+F)	Lab H H
<b>Alpha 1 Antitrypsin (S)</b>  When Alpha 1 Antitrypsin is <1.2 g/L the Ref Lab performs the <b>Phenotype</b> automatically.	0.9-2.0 g/L  Phenotype Text Comment	Ref
<b>Alpha Fetoprotein (S)</b>	0 – 5.8 KU/L	Lab KIT
<b>Alpha galactosidase A (BI) and (P)</b>	4 - 21.9 nmol/hr/ml	Ref
<b>Aluminium (P)</b>	< 0.4 µmol/L	Ref
<b>Alanine Transaminase (ALT) (S)</b>	Adult <b>F</b> 10 - 35 U/L <b>M</b> 10 – 50 U/L	Lab KIT



<b>Beta 2 Microglobulin (S)</b>	<2.4 mg/L	Ref
<b>Beta HCG (S)</b>	<b>F</b> 0 – 5 IU/L <b>M</b> 0 – 3 IU/L	Lab KIT
<b>Bicarbonate (HCO<sub>3</sub>) (S)</b>	22 – 29 mmol/L	Lab KIT
<b>Bile Acids (S)</b>	0 – 10 µmol/L	Lab KIT
<b>Bilirubin (S)</b>	0 – 21 µmol/L	Lab KIT
<b>Bilirubin (U)</b>	Text report	Lab
<b>Biotinidase Activity (P)</b>	4 00 - 15.00 nmol/L PABA/ml plasma/min	Ref
<b>Blood Gases</b> pH pO <sub>2</sub> pCO <sub>2</sub>	7.36 - 7.44 12.0 - 15.0 kPa 4.5 - 6.1 kPa	POCT
<b>C-Peptide (S)</b>	An interpretation of the results will depend on the <b>glucose result</b> and the clinical details provided. For further clarification please contact the lab.	Ref
<b>C-Reactive Protein (CRP)</b>	<5 mg/L	Lab KIT
<b>CA 15-3 (S)</b>	0 - 29 kU/L	Lab KIT
<b>CA 19-9 (S)</b>	0 - 34 kU/L	Lab KIT
<b>CA 125 (S)</b>	0 - 35 kU/L	Lab KIT
<b>Cadmium (BI)</b>	Normal (Smoker): <53 nmol/L Normal (Non-smoker): <27nmol/L Hazardous: >180nmol/L	Ref
<b>Calcitonin (P)</b>	Male 0 – 11.8ng/L      Female 0 – 4.8ng/L	Ref
<b>Calcium (S)</b>	<b>Age</b> <b>mmol/L</b> Neonate                    2.0 2.7      (Actual not adjusted) Infant - 16 yrs            2.2 2.7 Adult                        2.2 - 2.6	Lab H
<b>Calcium (U)</b>	2.5- 7.50 mmol/24h	Lab H
<b>Calprotectin (F)</b>	0 - 49 ug/g and text comment	Lab
<b>Carbamazepine (S)</b> Proprietary Name - <b>Tegretol</b> (ACD/AED)	4 – 12 mg/L	Lab H
<b>Carbohydrate Def.-Transferrin</b>	< 1.6% and Text comment	Ref
<b>Carboxyhaemoglobin (P- Li Hep)</b>	Non smokers up to 3% Smokers up to 15%	Medscape 2014

	Individuals with haemolytic anaemia and neonates may have a level of up to 5%.																									
<b>Carcino Embryonic Antigen (CEA) (S)</b>	0 – 5.0 ug/L Smokers up to 6.5 ug/L	Lab KIT																								
<b>Carotene (S)</b>	0.9 – 4.7 µmol/L	Ref																								
<b>Catecholamines (U)</b>	<table border="0"> <tr> <td></td> <td>Naradrenalin Nmol/24h</td> <td>Adrenaline nmol/24h</td> <td>Dopamine nmol/24h</td> </tr> <tr> <td>0 – 3M</td> <td>0 – 53</td> <td>0 – 23</td> <td>0 – 646</td> </tr> <tr> <td>3M – 1Y</td> <td>0 – 95</td> <td>0 – 23</td> <td>0 – 646</td> </tr> <tr> <td>1 – 6Y</td> <td>0 – 183</td> <td>0 – 50</td> <td>0 – 1417</td> </tr> <tr> <td>6 – 16Y</td> <td>0 – 420</td> <td>0 – 57</td> <td>0 – 2380</td> </tr> <tr> <td>&gt;16Y</td> <td>0 – 500</td> <td>0 – 100</td> <td>0 – 3000</td> </tr> </table>		Naradrenalin Nmol/24h	Adrenaline nmol/24h	Dopamine nmol/24h	0 – 3M	0 – 53	0 – 23	0 – 646	3M – 1Y	0 – 95	0 – 23	0 – 646	1 – 6Y	0 – 183	0 – 50	0 – 1417	6 – 16Y	0 – 420	0 – 57	0 – 2380	>16Y	0 – 500	0 – 100	0 – 3000	Ref
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>16Y	0 – 500	0 – 100	0 – 3000																							
<b>Clobazam</b>	30-300 ug/L	Ref																								
<b>Chloride (U)</b> <b>Chloride (S)</b>	N/A 95 – 108 mmol/L	Lab KIT																								
<b>Cholesterol (S)</b>	<b>mmol/L</b> <table border="0"> <tr> <td><b>F</b></td> <td><b>M</b></td> </tr> <tr> <td>0 – 5.0</td> <td>0 – 5.0</td> </tr> </table>	<b>F</b>	<b>M</b>	0 – 5.0	0 – 5.0	Lab KIT																				
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0 – 5.0	0 – 5.0																									
<b>Cholinesterase &amp; Dibucaine No. (S)</b> Sensitivity to Scoline (Suxamethonium) Cholinest. Activity Dibucaine No. Fluoride No. R02 Genotype Phenotype	600-1400 IU/L 76 - 83 56 - 66 93 - 98 Text report Text report	Ref																								
<b>Chromium (BI)</b>	0 – 40 nmol/L Hip replacements:repeat in 3/12 if > 135 nmol/L (MDA/2010/033)	Ref																								
<b>Chromogranin A (P)</b>	0 – 59 pmol/L	Ref																								
<b>Chromogranin B (P)</b>	0 – 149 pmol/L	Ref																								
<b>Citrate (U)</b>	0.6 - 4.8 mmol/24h	Ref																								
<b>Clobazam (S)</b> <b>Desmethyloclobazam</b>	0.1 – 0.4 mg/L none given	Ref																								
<b>Clonazepam (S)</b>	20 – 70 µg/L	Ref																								
<b>Cobalt (BI)</b>	0 – 10 nmol/L Hip replacements:repeat in 3/12 if > 120 nmol/L (MDA/2010/033)	Ref																								
<b>Copper (S)</b>	0 – 4 months 1.4 – 7.2 umol/L 4- 6 months 3.9 – 17.3 umol/L 7– 12 months 7.9 – 20.5 umol/L >1yr 12 -25 umol/L	Ref																								
<b>Caeruloplasmin (S)</b>	Birth to 3 months 0.08 – 0.23 g/L Older than 3 months 0.2-0.45 g/L																									
<b>Copper (U)</b>	0 – 1.0µmol/24h	Ref																								
<b>Cortisol (S)</b>	137 – 429 nmol/L (9 am)	Lab W																								

<b>Creatinine (S)</b>	<b>Age</b>	<b>µmol/L</b>	Lab KIT
	01M	27 – 77	
	02M	27 – 77	
	01Y	14 – 34	
	03Y	15 – 31	
	05Y	23 – 37	
	07Y	25 – 42	
	09Y	30 – 47	
	11Y	29 – 56	
	13Y	39 – 60	
15Y	40 – 68		
	<b>F</b>	<b>M</b>	
Adult	45 – 84	59 - 104	
<b>Creatinine Clearance (U)</b>	A. Male - 95 - 140 ml/min A. Female - 85 - 125 ml/min		Lab KIT
<b>Creatine Kinase (S)</b>		<b>F</b> <b>M</b>	Lab H
Adult	25 - 200	40 - 320	
<b>Crosslinks NTX (U) for Hydroxyproline</b>	Premenopausal women - 5 – 65 nM BCE/mM Post menopausal women - 5 – 131 nM BCE/mM Males – Up to 51 nm BCE/mM Creatinine - µmol/L		Ref
<b>Cryoglobulins (BI)</b>	No significant amount should be detected.		Lab
<b>Cyclosporin (S), To King's (EDTA)</b>	No specific reference range available. Reference ranges vary from Hospital to Hospital. <b>Please state transplant hospital.</b>		Ref
<b>Cystine (U)</b>	<420 mmol/24hr		Ref*
<b>Desmethylobbazam (S)</b>	300 – 3000 ug/L		Ref
<b>Dehydroepiandrosterone SO4 (S)</b>	sex related reference range    umol/L		Ref
	Adult Males	2.2-15.2	
	Adult Females	0.9-11.5	
<b>Diazepam (P)</b> <b>Desmethyl Diazepam</b>	0 - 1.0 mg/L 0 - 1.5 mg/L		Ref
<b>Digoxin (S)</b>	0.5 – 1.0µg/L		Lab H
<b>Dihydrotestosterone</b>	Age and sex related reference range    nmol/L		Ref
	<b>Age/Stage</b>	<b>Male</b>	<b>Female</b>
	Cord blood	70 – 175	70 – 170
	0-14 days	<1.890	0.86 – 3.94
	2weeks-6 mths	0.14 – 4.130	<0.1
	6 mths– Tanner 1	<0.1	<0.1
	<9.8yrs Tanner 1	<100	<100
	9.8-14.5 Tanner 2	0.1-0.59	0.170-0.41
	10.7-15.4 Tanner 3	0.28-1.14	0.24-66
	11.8-16.3 Tanner 4	0.76-1.79	0.14-0.40
	12.8-17.3 Tanner 5	0.83-2.24	0.10-0.62+
	Adult	0.86-3.40	0-1.27
	Post menopausal		0- 0.62



<b>Diuretic Screen</b>	Text report	Ref
<b>Dothiepin (S)</b> <b>Desmethyldothiepin</b> <b>Total</b>	µg/L µg/L µg/L (60-200)	Ref
<b>Drug Screen (S)</b>	Text report.	Ref
<b>Drug Screen (U)</b>	Text report.	Ref
<b>Elastase (faecal)</b>	>200µg/g and Text Comment	Ref
<b>Ethosuximide (S)</b> (ACD/AED)	40 - 100 mg/L	Ref
<b>Ethylene Glycol</b>		
<b>Ferritin (S)</b>	Female 13-150 µg/L Male 30-400 µg/L	Lab KIT
<b>Feacal test for Haemoglobin (FIT) (F)</b>	0 – 9 µg/g	Lab KIT
<b>Folate (S)</b>	2.4 – 17.5 µg/L	Lab Annals Clin.Biohem. 2019, Vol.56(1) 183- 184
<b>Free T4 (S)</b>	12 – 22 pmol/L	Lab KIT
<b>Free T3 (S)</b>	3.1 – 6.8 pmol/L	Lab KIT
<b>FSH (S)</b>	Post Menopausal 25.8 – 134.8 IU/mL Follicular 3.5 – 12.5 IU/mL Mid-Cycle 4.7 – 21.5 IU/mL Luteal 1.7 – 7.7 IU/mL Males 1.5 – 12.4 IU/mL	Lab KIT
<b>G-1-P Uridyl Transferase (BI)</b>	20.2 – 46.4 µmol/h/g Hb	Ref
<b>Galactose-1-Phosphate (BI)</b>	Normal - Non Galactosemic - <0.1 µmol/g/Hb Untreated Galactosemic - Up to 10.8 µmol/g/Hb Patient on diet when levels dropping and levels stabilized - 0.1 - 0.57 µmol/g/Hb	Ref
<b>Gamma GT (S)</b>	<b>Age U/L</b> <b>F M</b> Adult 0 - 40 0 - 60	Lab KIT
<b>Glucose (CSF)</b>	The CSF glucose is usually 60-80% of the blood glucose collected within 15 mins of the lumbar puncture. CSF glucose CANNOT be interpreted without a concurrent blood glucose.	Lab
<b>Glucose (Fluid)</b>	N/A	Lab KIT
<b>Glucose (Fasting) (P)</b>	<5.5 mmol/L	Lab N

<b>Glucose (Random) (P)</b>	5.5-6.9 mmol/L = Non diabetic hyperglycaemia (NDH) >7.0 mmol/L consistent with diabetes, repeat test in 2 weeks if asymptomatic. <b>4.1 – 11.0 mmol/L</b>	T
<b>Gut Hormone (P)</b> Glucagon Gastrin Vasointestinal Peptide Somatostatin Pancreatic polypeptide Chromogranin A Chromogranin B	0 - 50 pmol/L 0 - 40 pmol/L 0 - 30 pmol/L 0 - 150 pmol/L 0 - 300pmol/L 0 - 59 pmol/L 0 - 149 pmol/L	Ref
<b>HbA<sub>1c</sub> (P)</b>	Non-diabetic 20 – 42 mmol/mol Good control 48 – 59 mmol/mol Diabetes ≥ 48 mmol/mol	Diabetes UK
<b>HDLC (S)</b>	1.2 – 3.0 mmol/L	Lab Joint British Societies for the prevention of Cardiovascular disease. (JBS3)
<b>HMBS (Washed RBC &amp; P)</b>	20 - 42 nmol uroporphoyrin/mL/red cells/h	Ref
<b>Homocysteine (S)</b>	0 - 15µmol/L	Ref
<b>Human Growth Hormone (S)</b>	Random < 0.3 ug/L excludes acromegaly Random > 6.7 ug/L excludes GH deficiency	Lab KIT
<b>Hydroxyproline (U)</b>	See Crosslinks NTX	Ref
<b>IgA (S)</b>	See Immunoglobulins	Lab KIT
<b>IgD (S)</b>	Text Comment	Ref
<b>IGF-1 (S)</b>	Age and sex related reference range  <b>Age                      Range (nmol/L)</b> <b>                                    Male                      Female</b> 1 – 5Y                      1.6 - 30.5                      1.2 – 32.9 6 – 8Y                      2.2 – 45.5                      3.1 – 51.9 9 – 11Y                      3.0 – 60.1                      6.4 – 71.9 12 – 15Y                      6.4 – 68.1                      11.8 – 78.1 16 – 20Y                      15.6 – 66.9                      14.3 – 68.9 21 – 24Y                      13.8 – 47.7                      13.4 – 46.0 25 – 39Y                      10.7 – 37.1                      10.2 – 40.7 40 – 54Y                      8.1 – 31.0                      6.7 – 35.5 >55Y                      2.0 – 32.2                      2.2 – 32.0	Ref
<b>IGFBP3 (S)</b>	Age and sex related reference ranges exist; please contact laboratory	Ref
<b>IgG (S)</b>	See Immunoglobulins	Lab KIT
<b>IgG Albumin Ratio / Oligoclonal Bands (S &amp; CSF)</b> <b>CSF</b>	<b>Age related reference range</b>  <b>Age      Alb g/L                      IgG g/L</b>	Ref

<b>SERUM</b>	<30	0.17	0.017	
	31-40	0.18	0.021	
	41-50	0.20	0.024	
	51-60	0.24	0.027	
	61-77	0.24	0.026	
	<u>IgG</u> - See Immunoglobulins reference ranges			
	<b>Ignore the Albumin reference ranges from the Referral lab and use our albumin reference ranges in its place.</b>			
<b>IgM (S)</b>	See Immunoglobulins			Lab KIT
<b>Immunofixation (S)</b>	Text report			Lab
<b>Immunofixation (U)</b>	<b><u>Text report</u></b>			Lab
<b>Immunoglobulins (S)</b>	<b>AGE</b>	<b>IgG g/L</b>	<b>IgA g/L</b>	<b>IgM g/L</b>
	01Y	2.32 - 14.11	0.00 - 0.83	0.00 - 1.45
	03Y	4.53 - 9.16	0.20 - 1.00	0.19 - 1.46
	06Y	5.04 - 14.65	0.27 - 1.95	0.24 - 2.10
	09Y	5.72 - 14.74	0.34 - 3.05	0.31 - 2.08
	11Y	6.89 - 15.60	0.53 - 2.04	0.31 - 1.79
	13Y	7.59 - 15.50	0.58 - 3.58	0.35 - 2.39
	15Y	7.16 - 17.11	0.47 - 2.49	0.15 - 1.88
	19Y	5.49 - 15.84	0.61 - 3.48	0.23 - 2.59
	150Y	7.00 - 16.00	0.70 - 4.00	0.40 - 2.30
<b>Immunoreactive Trypsin (S)</b>	0 - 60 µg/L			Ref
<b>Inhibin B (S)</b>	Post-menopausal	0 - 9.8pg/ml		Ref
	Pre-menopausal	varies depending on stage of pregnancy cycle		
		0 - 341 pg/ml		
<b>Insulin (P)</b>	An interpretation of the results will depend on the glucose result and the clinical details provided. For further clarification please contact the lab.			Ref
<b>Iron studies (S)</b>	Iron	5.8 – 34.5 µmol/L		Lab KIT
	Transferrin	2.0 – 3.6 g/L		
	TIBC	45 – 81 µmol/L		
<b>Ketones (U)</b>	Text report			Lab POCT
<b>Lactate (BI)</b>	0.5 – 2.2 mmol/L			Lab KIT
<b>Lamotrigine (S)</b>	1 - 15mg/L (anticonvulsant) 1 - 5 mg/L (bipolar)			Ref
<b>Laxative Screen (U)</b>	Text report			Ref
<b>Levetiracetim (S)</b>	10 – 37 mg/L			Ref
<b>LDH (S)</b>	Up to 250 U/L			Lab KIT
<b>Lead (BI)</b>	Normal : 0 - 0.7 µmol/L Children 0 - 0.5 µmol/L			Ref

	Adults industrial exposure 0 - 1.4 µmol/L There is a need to reduce occupational exposure if the blood lead exceeds 2.0 µmol/L and suspension from exposure at 3.0 µmol/L or higher.	
<b>Lead ((U)</b>	< 100 nmol/24 h	
<b>LH (S)</b>	Post Menopausal 7.7 - 58.8 IU/mL Follicular 2.4 - 12.0 IU/mL Mid-Cycle 14.0 - 95.6 IU/mL Luteal 1.0 - 11.4 IU/mL Males 1.7 - 8.6 IU/mL	Lab KIT
<b>Lipid profile (S)</b>		Lab Joint British Societies for the prevention of Cardiovascular disease. (JBS3)
Cholesterol	0 – 5.0 mmol/L	
Triglycerides	0 – 1.7 mmol/L	
HDL - cholesterol	1.2 – 3.0 mmol/L	
Calculated LDL cholesterol	1.0 – 3.0 mmol/L	
Calculated Non HDL - cholesterol	<2.5 mmol/L	
<b>Lithium (S)</b>	0.4 – 1.0 mmol/L	Lab H
<b>Lipase (S)</b>	6 – 51U/L	Ref
<b>Lp(a) (S)</b>	> 300 mg/L – Increased CVD risk	Ref
<b>Macro CK (S)</b>	Text report	Ref
<b>Manganese (BI)</b>	Children >1yr/Adults 73 - 210 nmol/L Children < 1yr 120 - 325 nmol/l	Ref
<b>Magnesium (S)</b>	0.70 - 1.00 mmol/L	Lab H
<b>Magnesium (U)</b>	0.65 – 1.05 mmol/24hr	Ref
<b>Mercury (U)</b> (Long term exposure or exposure to Inorganic Mercury Compounds)	Normal: <5 µmol/mol creat	Ref
<b>Mercury (BI)</b> (Recent exposure -few days or exposure to Organic Mercury Compounds e.g. Ethyl or Methyl Mercury)	Normal: <5 nmol/L	Ref
<b>Metadrenaline (P)</b>	80 – 510 pmol/L	Ref
<b>Methanol</b>		
<b>Microalb/Creatinine Ratio (U)</b>	See Albumin/Creatinine Ratio (U)	Lab
<b>Mucopolysaccharides (U)</b>	Text report	Ref

<b>Neurone Specific Enolase (S)</b>	0 – 15.0 µg/L	Ref
<b>Nitrazepam (S)</b>	50 - 150 µg/L	Ref
<b>Normetadrenaline (P)</b>	120 – 1180 pmol/L	Ref
<b>Organic Acid Studies (U)</b>	Text report	Ref
<b>Osmolality (S)</b>	275 – 295 mOsmol/kg	Lab H
<b>Osmolality (U)</b>	Normal early morning urine >600 mmol/Kg	Lab Contact lab for reference
<b>Overdose Screen (S)</b>	See paracetamol and salicylate	Lab
<b>Oxalate (U)</b>	0 - 460 µmol/24h	Ref
<b>Paracetamol (S)</b>	Not normally detected.	Lab
<b>Paraproteins (S)</b>	Text report	Lab*
<b>Paraproteins (U)</b>	Text report	Lab*
<b>Paraquat (U)</b>	Not normally detected.	Ref
<b>Parathyroid Hormone (PTH) (P)</b>	10 - 65 ng/L but needs to be interpreted with serum calcium (for both EDGH and Conquest)	Lab KIT
<b>pH (BI)</b>	7.36 - 7.44	POCT KIT
<b>Phenobarbitone (S) (ACD/AED)</b>	20 - 40 mg/L	Ref
<b>Phenylalanine (Phenylketonuria)</b>	34 - 110 µmol/L	Ref
<b>Phenytoin (S) Proprietary Name - <u>Epanutin</u> (ACD/AED)</b>	5 – 20 mg/L	Lab H
<b>Phosphate (S)</b>	Age                      mmol/L 01M                    1.3 - 2.6 01Y                    1.3 - 2.4 16Y                    0.9 - 1.8 150Y                  0.8 - 1.5 Adult                  0.8 - 1.5	Lab KIT H
<b>Phosphate (24 hour urine output) (U)</b>	15 – 15 mmol/24 hr	Lab H
<b>Pigments (U)</b>	Text report.	Lab
<b>Porphobilinogen (U)</b>	0 - 1.5 µmol/mmol creatinine Please note an urgent qualitative assay is available in house. Please phone lab if required.	Ref Lab KIT

<b>Porphyrins (BI)</b>	RBC free protoporphyrin: 0 – 200 nmol/L cells RBC zinc protoporphyrin: 0 – 800 nmol/L cells HMBS Activity 20 – 42 nmol/uroporphyrin/mL red cells/hr 37 °C	Ref
<b>Porphyrins (F)</b>	0 – 50 mmol/g faeces	Ref
<b>Porphyrins (U)</b>	0 – 35 nmol/mmol creatinine  Random ALA Excretion 0 – 3.8 µmol/mmol creatinine. Total uroporphoyrin (I+III) < 24 nmol/L Heptacarboxylate porphyrin < 4 nmol/L Total corpoporphyrin (I+III) <115 nmol/L	Ref
<b>Potassium (S)</b>	Adult 3.5 - 5.3 mmol/L	Lab H
<b>Primidone (S)</b> Proprietary Name - <b><u>Mysoline</u></b> <b>(ACD/AED)</b>	Less than 13 mg/L	Ref
<b>Procalcitonin (S)</b>	Procalcitonin <0.10 ug/L - Antibiotics strongly discouraged Procalcitonin 0.10-<0.25 ug/L - Antibiotics discouraged Procalcitonin 0.25-0.50 ug/L - Antibiotics encouraged Procalcitonin >0.50 ug/L - Antibiotics strongly encouraged	Lab KIT
<b>Procollagen Peptide Type III</b>	Age related (ug/L)  <b>Age</b> 0 - 3 years 3.4 – 52.6 4 - 9 years 3.4 – 12.1 10 - 16 years 2.9 – 24.4 17 - 18 years 2.0 – 7.0  Adult 1.2 – 4.2	Ref
<b>Progesterone (S)</b>	Follicular phase 0.2 - 2.8 nmol/L Mid-cycle 0.4 - 38.1 nmol/L Luteal phase 5.8 - 75.9 nmol/L Post-menopausal <0.2 - 0.4 nmol/L Males <0.2 - 0.5 nmol/L	Lab KIT
<b>Proinsulin (S)</b>	Less than 10 pmol/L	Ref
<b>Prolactin (S)</b>	Male: 86 – 324mU/L (EDGH and CONQ) Female: 102 – 496mU/L	Lab KIT
<b>Protein (CSF)</b>	0.15 - 0.45 g/L	Lab KIT
<b>Protein:creatinine ratio (U)</b>	0 – 45 mg/mmol	Lab KIT
<b>Protein Electrophoresis (S)</b>	Text report	Lab*
<b>Protein-24 hour (U)</b>	0.00 – 0.14 g/24h	Lab KIT
<b>PSA (S)</b>	49Y 0.00 2.00 ng/mL 59Y 0.00 3.00 69Y 0.00 4.00 150Y 0.00 5.00	Lab Nice CG 12
<b>Quinine</b>	10 – 15mg/L	Ref

<b>Renin</b>	Upright 5.4 - 60 mU/L Supine 5.4 - 30 mU/L  Aldosterone/Renin ratio <80 Conn's unlikely >=200: Conns' likely 80-200: Conn's not excluded	Ref
<b>Rheumatoid Factor (S)</b>	<14 IU/ml	Lab KIT
<b>Salicylate (S)</b>	mg/L. Not normally detected.	Lab
<b>Selenium (S)</b>	Adult 0.9 - 1.65 µmol/L < 16yr 0.4 - 1.4 umol/L	Ref
<b>Sex Hormone Binding Globulin (S)</b>	<b>Age</b> <b>F</b> <b>M</b> up tp 50yrs 32 - 128    18 - 54    nmol/L 51-150 yrs 27 - 128    21 - 77    nmol/L	Lab KIT
<b>Serum free light chains (sFLCs) (S)</b>	Kappa 3.30 - 19.4 mg/L Lambda 5.71 - 26.3 mg/L Ratio 0.26 - 1.65 (0.37-3.10 in patients on dialysis)	Ref
<b>Sodium (S)</b>	133 - 146 mmol/L	Lab H
<b>Sodium 24 hour output (U)</b>	40 - 220 mmol/24hr	Lab KIT
<b>Sodium Valproate</b> Proprietary Name - <b>Epilim</b> (ACD/AED)	50 - 100 mg/L	Lab KIT
<b>Solvent Screen (U) (EDTA)</b>	Text report	Ref
<b>Squamous Cell Carcinoma (SCC) (S)</b>	0 - 150ng/dLI	Ref
<b>Steroid Profile (U)</b>	Text report - based on relevant biochemical and clinical information provided.	Ref
<b>Stone Analysis (Stone)</b>	Weight in mg Composition in %	Ref
<b>Sugar Chromatography (F)</b>	All sugars <1.0 mmol/Kg faeces Ref. interval variable: not usually > 1.0 mmol/Kg	Ref
<b>Sugar Chromatography (U)</b>	Text report - Less than 1 month of age up to 3 mmol/L lactose or galactose, if receiving high carbohydrate diet. The sugars must be present in the diet to be detected i.e., to exclude galactosaemia the infant must be having feeds containing lactose.	Ref
<b>Sugars (U)</b>	Text report	Lab
<b>Sweat Test</b> Sweat Chloride  Conductivity Testing	Normal: <40 mmol/L Borderline: 40 - 60mmol/L Fibrocystic: >60mmol/L  Normal: 0 - 60 mmol/L Borderline: 60 - 90 mmol/L Fibrocystic: >90 mmol/L	Lab KIT
<b>Tacrolimus (FK506)</b>	2.0 - 15 µg/L Depends on referral lab.	Ref

<b>TCO2 (S)</b>	<b>Renamed as bicarbonate</b>	
<b>Temazepam (S)</b>	Text report	Ref
<b>Testosterone (S)</b>	<p style="text-align: center;"><b>F</b>                      <b>M</b></p> 50Y 0.29 - 1.67                      8.64    29 150Y 0.1 - 1.42                      6.68    25.7 (for both CONQ and EDGH)	Lab KIT
<b>Theophylline (S)</b>	10 - 20 mg/L	Lab H
<b>Thiamine (EDTA) (Vitamin B1)</b>	66.5 - 200 nmol/L	Ref
<b>Thyroglobulin (Tg)(S)</b>	0 - 40ug/L	Ref
<b>Thyroid Function Tests (S)</b> FT3 FT4 TSH	3.1 – 6.8 pmol/L (EDGH and CONQ) 12 - 22 pmol/L 0.27 - 4.2 mU/L	Lab KIT
<b>TPMT (thiopurine methyl transferase (E)</b>	26 – 50 pmol/h/mg Hb normal 10 – 25 pmol/h/mg Hb carrier <10 pmol/h/mg Hb deficiency Plus text interpretation and advice	Ref
<b>TPO (S)</b>	0-34 IU/mL (Conquest only)	Lab KIT
<b>Total Protein (S)</b>	60 – 80g/L	Lab H
<b>Transketolase (Red Cell)</b>	Red Cell Transketolase- 0.40-1.13 U/G Hb Transketolase activation - <27 %	Ref
<b>Triglyceride (Fasting) (S)</b>	<p style="text-align: center;"><b>F</b>      <b>M</b>      mmol/L</p> 0 – 1.7    0 – 1.7	Lab KIT
<b>Troponin T (S)</b>	<p>Troponin T should be measured at presentation and 6-9 hours later:</p> <p>Both levels &lt;14ng/L: MI can be ruled out(unless further chest pain or ECG changes suggest further investigation is required).</p> <p>If at LEAST ONE Troponin T is 14ng/L or above AND            &lt;20% change: not consistent with an acute event            20-100% change: significant rise, suggest further evaluation to distinguish between other causes and chronic elevation in Troponin T.            &gt;100% change (a doubling): consistent with myocardial necrosis.</p>	Lab KIT
<b>TSH (S)</b>	0.27 – 4.2 uU/L (CONQ and EDGH)	Lab KIT
<b>TSH Binding Inhibiting Ig</b>	< 1.0 U/L negative 1.0 – 1.5 U/L borderline > 1.5 U/L positive	Ref
<b>Urate (S)</b>	<b>F</b> 140 – 360 µmol/L	Lab H



	M 200 – 430 Results greater than 0.35 umol/L are above target for gout prevention	
<b>Urate (U)</b>	Depends on intake	Lab
<b>Urea (S)</b>	<b>Age</b> 01M 0.8 5.5 mmol/L 01Y 1.0 5.5 16Y 2.5 6.5 150Y 2.5 7.8	Lab H
<b>Metanephrines (U)</b>	<b>Normetadrenaline nmol/24Hrs</b> <b>Metadrenaline nmol/24hrs</b> 0 – 3M            0 – 0.9            0 – 0.2 3M – 1Y           0 – 0.6            0 – 0.2 1Y – 3Y            0 – 0.6            0 – 0.3 3Y – 8Y            0 – 1.4            0 – 0.5 8Y – 12Y           0 – 1.9            0 – 0.8 >12Y               0 – 3.3            0 – 1.2	Ref
<b>Urobilin (U)</b>	Text report	Lab
<b>Urobilinogen (U)</b>	Text report	Lab
<b>Valproate (S)</b> Proprietary Name – <b>Epilim</b> (ACD/AED)	50 - 100 mg/L	Lab KIT
<b>Very Long Chain Fatty Acids (VLCFA)/ Phytanic (PI)</b>	Text report	Ref
<b>Vitamin A (P)</b>	AGE (Years) 0 – 2    0.49 – 1.43 µmol/L 3 – 5    0.56 – 1.47 µmol/L 6 - 8    0.66 – 2.00 µmol/L 9 – 11   0.77 – 2.06 µmol/L 12 – 13 0.84 – 2.20 µmol/L 14 – 15 0.94 – 2.65 µmol/L 16 +    1.40 – 3.84 µmol/L	Ref
<b>Vitamin B12 (S)</b>	197 – 771 ng/L	Lab KIT
<b>Vitamin D (25) (S)</b>	>75 – 200 nmol/L Optimal 50 – 75 nmol/L Adequate for most people 25 – 50 nmol/L Insufficient <25 nmol/L Severely deficient, may be associated with rickets/osteomalacia.	Lab Source 1
<b>Vitamin D (1,25)</b>	55 – 139 pmol/L	Ref
<b>Vitamin E (P)</b>	AGE (Years) 0 – 2    0.0 – 25.0 µmol/L 3 – 5    7.0 – 30.1 µmol/L 6 - 8    10.0 – 34.8 µmol/L 9 – 11   13.9 – 32.5 µmol/L 12 – 13 10.9 – 34.8 µmol/L 14 – 15 13.9 – 32.5 µmol/L 16 +    11.6 – 41.8 µmol/L	Ref
<b>White Cell Enzyme</b>	Text report	Ref

Xanthochromia (CSF)	Text report – based on National Guidelines	Lab
Zinc (P)	11 – 19 µmol/L	Ref

**NOTE:** *Reference ranges are liable to change due to updates in equipment, methods, reagents and change in Referral Labs. Reference ranges are updated on our computer system as they are received.*

*Please contact us if you need further information on tests or reference ranges.*

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