



REFERENCE INTERVALS - HAEMATOLOGY

COMPLETE BLOOD COUNT				
	UNITS	Male	Female	Antenatal
Red Blood Count	10 ¹² /L	4.3-6.0	3.6-5.6	3.4-5.0
Haemoglobin	g/L	130-175	115-155	100-145
HCT (PCV)	ratio (L/L)	0.40-0.52	0.35-0.46	0.30-0.44
MCV	f/L	80-99	80-99	80-99
MCH	pg	27-33	27-33	27-33
MCHC	g/L	320-360	320-360	320-360
RDW	%	11.5-15	11.5-15	
Platelet Count	10 ⁹ /L	150-400	150-400	150-400
White Blood Count	10 ⁹ /L	4.0-11.0	4.0-11.0	5.0-14.5
Neutrophils	10 ⁹ /L	1.9-7.5	1.9-7.5	1.9-11.0
Lymphocytes	10 ⁹ /L	1.0-4.0	1.0-4.0	1.0-4.0
Monocytes	10 ⁹ /L	0.2-1.0	0.2-1.0	0.2-1.0
Eosinophils	10 ⁹ /L	0-0.50	0-0.50	0-0.50
Basophils	10 ⁹ /L	0-0.20	0-0.20	0-0.20
Reticulocytes (absolute)	10 ⁹ /L	10 - 100	10 - 100	
Ret- He	pg	28.9 – 36.3	28.9 – 36.3	

ESR		
Female	≤ 19 yrs	< 16 mm/hr
	20 – 23 yrs	< 18 mm/hr
	24 – 29 yrs	< 21 mm/hr
	30 – 33 yrs	< 23 mm/hr
	34 – 39 yrs	< 26 mm/hr
	40 – 43 yrs	< 28 mm/hr
	>44 yrs	0 – 30 mm/hr
Antenatal		< 46 mm/hr
Male	0 – 29 yrs	< 16 mm/hr
	30 – 33 yrs	< 18 mm/hr
	34 – 39 yrs	< 21 mm/hr
	40 – 43 yrs	< 23 mm/hr
	> 44 yrs	0 – 25 mm/hr

COAGULATION		
Prothrombin time		9 - 14.0 secs
INR	Normal Interval	0.8 - 1.2
	Therapeutic Interval (Standard Risk)	2.0 - 3.0
	Therapeutic Interval (High Risk)	2.5 – 3.5
A.P.T.T.		20.0 - 31.0 secs
Fibrinogen		1.5 - 4.0 g/L
Dilute Thrombin clotting Time		< 21 secs
D-Dimer		Cut Off
	< 50 yrs	500 ug/L
	51 – 60 yrs	600 ug/L
	61 – 70 yrs	700 ug/L
	71 – 80 yrs	800 ug/L
	81 – 90 yrs	900 ug/L
> 90 yrs	1000 ug/L	

Last Reviewed:	Authorized	Quality Manager, Labtests Auckland	Haematologist, Labtests Auckland
July 2023	Date: 26/7/23	Saad Mansour	Dr Lesley Overend

REFERENCE INTERVALS - CLINICAL CHEMISTRY



Labtests

37-41 Carbine Road
Mt Wellington 1060
PO Box 12049
Penrose 1642
Auckland
Ph: +64 9 574 7200
www.labtests.co.nz

RENAL FUNCTION

Test Group – Renal Function	Detail	Interval	Units	Source
Sodium	<1mth	134 - 148	mmol/L	
	adult	135 - 145	mmol/L	
Potassium	<1mth	4.5 – 6.0	mmol/L	
	Adult	3.5 – 5.2	mmol/L	
Chloride	Adult	95 – 110	mmol/L	
Urea	<1mth	1 - 4	mmol/L	
	1mth – 1yr	1.4 – 5.4	mmol/L	
	1 yr – 4yr	1.8 – 5.4	mmol/L	
	Adult	3.2 – 7.7	mmol/L	
Creatinine	0 – 1wk	<95	umol/L	NZ Chem Path Quality Assurance Group (NZCPQAG)
	1wk – 4wk	<50	umol/L	
	4wk – 2yrs	<40	umol/L	
	2yrs – 6yrs	<50	umol/L	
	6 – 12yrs	<65	umol/L	
	12yrs – 15yrs	<80	umol/L	
	Female 15yrs – 19yrs	<90	umol/L	
	Male 15yrs – 19yrs	<105	umol/L	
	Adult female	45 - 90	umol/L	
Adult male	60 – 105	umol/L		
Uric Acid	Female	0.14 – 0.36	mmol/L	
	Male	0.20 – 0.42	mmol/L	
eGFR		> 90	mL/min/1.73m ²	
Creatinine Clearance	Female <40yrs	88 – 182	mL/min	
	Female 40 – 49yrs	80 – 174	mL/min	
	Female 50 – 59	72 – 160	mL/min	
	Female 60 – 69	64 – 158	mL/min	
	Female >70	56 - 150	mL/min	
	Male <40yrs	97 - 186	mL/min	
	Male 40 – 49yrs	91 - 180	mL/min	
	Male 50 – 59	85 - 175	mL/min	
	Male 60 – 69	66 - 164	mL/min	
	Male >70	60 - 156	mL/min	

DIABETIC

Test Group – Diabetic	Detail	Interval	Units
Glucose	Fasting	3.5 – 5.4	mmol/L
	Non Fasting	3.5 – 7.7	mmol/L
Glucose Challenge		< 7.8	mmol/L
Glucose Tolerance	Non-Pregnant Fasting	3.5 – 5.4	mmol/L
	Non-Pregnant 2 hour	< 7.8	mmol/L
	Pregnant Fasting	3.5 – 5.4	mmol/L
	Pregnant 2 hour	< 9.0	mmol/L
HbA1c		<41	mmol/mol
Bicarbonate	<2yrs	17 – 27	mmol/L
	≥2yrs	22 – 31	mmol/L
Albumin/Creatinine Ratio (Microalbumin ratio)	Female	<3.5	mg/mmol
	Male	<2.5	mg/mmol

Last Reviewed:	Authorized	Quality Manager, Labtests Auckland	Chemical Pathologist, Labtests Auckland
May 2023	Date: 19/5/23	Saad Mansour	Dr Charles Ng

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LIVER FUNCTION



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Mt Wellington 1060
PO Box 12049
Penrose 1642
Auckland
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Test Group – Liver Function	Detail	Interval	Units	Source	
Total Bilirubin	Up to 24 hours	<150	µmol/L		
	24 to 48 hours	<200	µmol/L		
	48 to 72 hours	<250	µmol/L		
	3 to 7 days	<300	µmol/L		
	7 days to 3 weeks	<100	µmol/L		
	3 to 4 weeks	<50	µmol/L		
Direct Bilirubin	4 weeks to Adult	<25	µmol/L		
	<1mth	<20	µmol/L		
ALP	Adult	< 5	µmol/L		
	Female	0 to <6 months	80 - 600	U/L	
		6 months to <10yrs	80 - 450	U/L	
		10 to <13yrs	45 - 460	U/L	
		13 to <15yrs	45 - 300	U/L	
		15 to <22yrs	45 - 150	U/L	
		22 to <50yrs	40 - 110	U/L	
		50 to <60yrs	40 - 120	U/L	
	60yrs and over	40 - 130	U/L		
	Male	0 to <6 months	80 - 600	U/L	
		6 months to <10yrs	80 - 450	U/L	
		10 to <15yrs	45 - 500	U/L	
		15 to <17yrs	45 - 380	U/L	
		17 to <19yrs	45 - 220	U/L	
19 to <22yrs		45 - 150	U/L		
22 to <50yrs		40 - 110	U/L		
50 to <60yrs	40 - 120	U/L			
60yrs and over	40 - 130	U/L			
GGT	<6mth	<150	IU/L		
	Adult female	<50	IU/L		
	Adult male	<60	IU/L		
ALT		< 45	U/L		
AST	<2yrs	<80	U/L		
	2 – 10yrs	<60	U/L		
	>10yrs	<45	U/L		
	Adult	<45	U/L		
Total Protein	<1mth	45 – 75	g/L	LPL	
	1 – 2mth	45 - 65	g/L		
	2 – 6mth	50 – 75	g/L		
	6mth – 1yrs	55 – 80	g/L		
	1 – 70yrs	66 – 84	g/L		
	>70yrs	64 – 82	g/L		
Albumin	0 – 3mths	25 - 40	g/L		
	3 – 12mths	32 - 45	g/L		
	≥1yr	32 - 48	g/L		
Globulin	0 – 90 days	>16	g/L	Laboratory data	
	90 – 365 days	>18	g/L		
	1 – 4 yrs	22 - 35	g/L		
	>4 yrs	25 - 41	g/L		
Lipase	serum	10 - 60	U/L		
Amylase	serum	25 – 135	U/L		

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May 2023	Date: 19/5/23	Saad Mansour	Dr Charles Ng

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BONE

Test Group – Bone	Detail	Interval	Units	Source
Calcium	1 – 3days	1.80 – 2.80	mmol/L	
	4days – 1yr	2.10 – 2.80	mmol/L	
	>1yrs	2.10 – 2.55	mmol/L	
Adjusted Calcium	<4days	1.80 – 2.80	mmol/L	
	4days – 1yr	2.10 – 2.80	mmol/L	
	>1yrs	2.10 – 2.55	mmol/L	
Phosphate	<1yr	1.40 – 2.50	mmol/L	NZ Chem Path Quality Assurance Group (NZCPQAG)
	1 – <4yrs	1.10 – 2.20	mmol/L	
	4 – <15yrs	0.90 – 2.00	mmol/L	
	15 – <18yrs	0.80 – 1.85	mmol/L	
	>18 yrs	0.75 – 1.50	mmol/L	
Magnesium		0.70 – 1.0	mmol/L	

IRON METABOLISM

Test Group – Iron Metabolism	Detail	Interval	Units	
Iron	0 - 2 months	10 – 31	µmol/L	
	2 months - 1year	4.0 – 27	µmol/L	
	1 - 3 years	5.0 – 23	µmol/L	
	3 - 10 years	6.0 – 25	µmol/L	
	10 - 18 years	8.0 – 32	µmol/L	
	Adult	10 - 30	µmol/L	
Transferrin		1.7 – 3.4	g/L	
Transferrin Saturation	0 – 2mths	0.35 – 0.94		
	2mths – 1yr	0.1 – 0.46		
	1 – 3yrs	0.1 – 0.42		
	3 – 10yrs	0.14 – 0.45		
	10 – 18yrs	0.15 – 0.50		
	>18yrs	0.15 – 0.50		
Ferritin	Female	0 - 5 months	15 - 400	ug/L
		5 - 11 months	15 - 80	ug/L
		1 - 14 years	15 - 150	ug/L
		15 - 19 years	15 - 170	ug/L
		20 - 29 years	20 - 170	ug/L
		30 - 40 years	20 - 190	ug/L
		>40 years	20 - 380	ug/L
	Male	0 - 5months	15 - 400	ug/L
		5 - 11 months	15 - 80	ug/L
		1 - 14 years	15 - 150	ug/L
		15 - 19 years	15 - 170	ug/L
		20 - 29 years	20 - 320	ug/L
		30 - 40 years	20 - 400	ug/L
		>40 years	20 - 450	ug/L

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THYROID FUNCTION

Test Group Thyroid Function	Detail	Interval	Units	Source
Free T4	>=4 days - 1 mth	10 - 40	pmol/L	
	>1 mth - 1 year	10 - 30	pmol/L	
	>1 yr - 12 yrs	11 - 22	pmol/L	Laboratory data
	>12 yrs	12 - 22		
TSH	4 days - 1 mth	0.4 - 16.0	mIU/L	
	1 mth - 1 yr	0.6 - 8.0	mIU/L	
	>1 yr - 18 yrs	0.5 - 4.5	mIU/L	
	>18 yrs	0.27 - 4.2	mIU/L	
Free T3	>=4 days - 7 yrs	3 - 10	pmol/L	
	>7 yrs - 19 yrs	3.5 - 8.0	pmol/L	
	>19 yrs	3.9 - 6.8	pmol/L	

REPRODUCTIVE HORMONES

Test Group – Reproductive Hormones	Detail		Interval		Units	Source
FSH	Male	0 – 1 yrs	<3.4		IU/L	NZ Chem Path Quality Assurance Group (NZCPQAG)
		1 – 9 yrs	<2.2		IU/L	
		9 – 12 yrs	0.4 – 4.2		IU/L	
		12 – 16 yrs	0.9 – 7.0		IU/L	
		>16 yrs	2 - 12		IU/L	
	Female	0 – 1 yrs	1.6 – 19		IU/L	
		1 – 9 yrs	0.7 – 5.8		IU/L	
		9 – 12 yrs	0.5 – 7.6		IU/L	
		12 – 16 yrs	0.9 – 9.1		IU/L	
		>16 yrs	Follicular	3 – 10	IU/L	
			Mid cycle	4 – 25	IU/L	
Luteal	2 – 8		IU/L			
	Post menopausal	>20	IU/L			
	Pregnant	<1	IU/L			
LH	Male	0 – 1 yrs				NZ Chem Path Quality Assurance Group (NZCPQAG)
		1 – 16 yrs				
		>16 yrs	2 – 9		IU/L	
	Female	0 – 1 yrs				
		1 – 16 yrs				
		>16 yrs	Follicular	2 – 8	IU/L	
			Mid cycle	10 – 75	IU/L	
			Luteal	2 – 8	IU/L	
			Post menopausal	>15	IU/L	
Pregnant	<1		IU/L			

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June 2023	Date: 14/06/23	Saad Mansour	Dr Charles Ng

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REPRODUCTIVE HORMONES

Test Group – Reproductive Hormones	Detail	Interval	Units
Progesterone	Ovulation unlikely	<6	nmol/L
	Ovulation possible	6 - 25	nmol/L
	Ovulation confirmed	>25	nmol/L
	Post menopausal	<3	nmol/L
Oestradiol	Follicular	50 - 850	pmol/L
	Mid-cycle	150 - 1450	pmol/L
	Luteal	85 - 1250	pmol/L
	Post Menopausal	< 180	pmol/L
	Male	<200	pmol/L
Prolactin	Female <= 50 years	<630	mIU/L
	Female >50 years	<500	mIU/L
	Male	<400	mIU/L
Monomeric prolactin	Female	< 400	mIU/L
	Male	<280	mIU/L
HCG		< 5	IU/L

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MISCELLANEOUS

Test Group – Miscellaneous	Detail	Interval	Units	Reference Interval origin
NT Pro BNP		<35	pmol/L	
CRP		< 5	mg/L	
CCP antibodies		<5	U/mL	
Rheumatoid Factor		<16	IU/mL	
IgG	Newborn - <2 wks	3.0 – 13.7	g/L	CALIPER – 3 platforms
	≥2 - <6 wks	1.2 – 6.0	g/L	Composite CALIPER and NZCPQAG
	≥6 wks - <6 mths	1.2 – 7.0	g/L	Composite CALIPER and NZCPQAG
	≥6 - <12 mths	3.0 – 10.5	g/L	NZCPQAG
	>1 - <4 yrs	3.0 – 11.2	g/L	CALIPER – 3 platforms
	≥4 - <10 yrs	5.0 – 13.3	g/L	CALIPER – 3 platforms
	≥10 - <19 yrs	6.0 – 15.0	g/L	NZCPQAG
	Adult (≥19 - <70 yrs)	7.0 – 16.0	g/L	NZCPQAG
	Adult ≥70 yrs	6.0 – 15.0	g/L	NZCPQAG
IgA	Newborn to <1 yr	<0.4	g/L	CALIPER – 3 platforms
	≥1 - <3 yrs	<1.1	g/L	CALIPER – 3 platforms
	≥3 - <6 yrs	<1.7	g/L	Composite CALIPER and NZCPQAG
	≥6 - <14 yrs	0.3 – 2.4	g/L	CALIPER – 3 platforms
	≥14 - <19 yrs	0.4 – 3.1	g/L	CALIPER – 3 platforms
	Adult (≥19 - <70 yrs)	0.8 – 4.0	g/L	NZCPQAG
		≥70 yrs	0.8 – 4.0	g/L
IgM	Newborn < 2 wks	<0.5	g/L	CALIPER – 3 platforms
	≥2 - <13 wks	0.1 – 0.7	g/L	CALIPER – 3 platforms
	≥13 wks - <1 yr	0.1 – 0.9	g/L	CALIPER – 3 platforms
	≥1 – <19 yrs	0.4 – 1.8	g/L	CALIPER – 3 platforms
	Adult (≥19 - <70 yrs)	0.4 – 2.5	g/L	NZCPQAG
		≥70 yrs	0.4 – 2.4	g/L
IgE		<100	kIU/L	
PTH		1.7 - 7.3	pmol/L	
Serum Cortisol	morning peak	170 - 500	nmol/L	
Testosterone	Female	<10yrs	<0.6	nmol/L
		10 – 15yrs	<1.5	nmol/L
		>15yrs	<1.9	nmol/L
	Male	10 – 14yrs	0 - 28	nmol/L
		15 – 19yrs	7.6 - 28	nmol/L
		20 -50yrs	8.7 - 29	nmol/L
	>50yrs	6.7 - 26	nmol/L	
Thyropoxidase Ab		<60	IU/mL	
Total PSA	<51 yrs	<2.5	ug/L	
	51 – 60 yrs	<3.5	ug/L	
	61 -70 yrs	<4.0	ug/L	
	>70 yrs	<6.5	ug/L	

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ENZYMES

Test Group – Enzymes	Detail	Interval	Units	Source
LDH	0 – 14 days	<1200	U/L	NZ Chem Path Quality Assurance Group (NZCPQAG)
	15 days to <1 yr	<450		
	1 year to <10yrs	<320		
	>10yrs	120 - 250		
CK	Female	30 – 180	U/L	
	Male	60 - 220	U/L	
Troponin T		<15	ng/L	

B12 / FOLATE

Test Group – B12 / Folate	Detail	Interval	Units
Vitamin B12	Normal	170 - 800	pmol/L
	Borderline	110 - 170	pmol/L
Serum Folate	Normal	5 – 45	nmol/L

DRUGS

Test Group – Drugs	Detail	Interval	Units
Lithium	Trough (12 hrs post dose)	0.5 – 1.0	mmol/L
Carbamazepine	Therapeutic range	17 – 40	µmol/L
Digoxin	Therapeutic range	0.60 – 2.00	nmol/L
Phenytoin	Therapeutic range	40 – 80	µmol/L
Valproic Acid	Therapeutic range	350 – 700	µmol/L

LIPIDS

Test Group – Lipids	Detail	Target Range	Units
Status			
Cholesterol	0 - 14 days	1.2 – 3.2	mmol/L
	15 days – 1 year	1.6 – 6.2	mmol/L
	1 – 19 years	2.9 – 5.4	mmol/L
	>19 years	<5.0	mmol/L
Triglycerides	0 - 14 days	0.9 – 3.0	mmol/L
	15 days – 1 year	0.6 – 3.0	mmol/L
	1 – 19 years	0.5 – 2.3	mmol/L
	>19 years	<2.0	mmol/L
HDL Cholesterol	0 -14 days	0.40 – 1.10	mmol/L
	15 days – 1 year	0.30 – 1.90	mmol/L
	1 - 19 year	0.80 – 1.90	mmol/L
	>19 years	>1.00	mmol/L
LDL Cholesterol		<3.4	mmol/L
Chol/HDL ratio		<4.5	mmol/L

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