

Pathology Clinical Trials – Trial Specific Reference Ranges 2024

Updated:	Issued By:	Signed:	For GVH test ranges, contact pathtrials@austin.org.au
20 th May 2024	Ryan Bolger		
Effective from:			
20 th May 2024			

LOINC Code	Test	Units	Reference Range	Gender	Notes
HAEMATOLOGY					
6690-2	White Cell Count (WCC)	x10 ⁹ /L	4.0 – 12.0	M/F	
789-8	Red Cell Count (RCC)	x10 ¹² /L	4.20 – 5.90	M	16-60 Years Old
			3.80 – 5.70	M	>60 Years Old
			3.60 – 5.20	F	>16 Years Old
718-7	Haemoglobin (Hb)	g/L	130 – 170	M	16-60 Years Old
			120 -170	M	>60 Years Old
			115 – 155	F	>16 Years Old
4544-3	Haematocrit (Hct)	L/L	0.36 – 0.50	M	> 16 Years Old
			0.33 – 0.45	F	> 16 Years Old
787-2	Mean Cell Volume (MCV)	fL	80 - 99	M/F	
785-6	Mean Cell Haemoglobin (MCH)	pg	26.0 – 34.0	M/F	
786-4	Mean Cell Haemoglobin Concentration (MCHC)	g/L	315 – 365	M/F	
788-0	Red Cell Distribution Width (RDW)	%	11.6 – 14.0	M/F	
777-3	Platelet Count	x10 ⁹ /L	150 - 400	M/F	
32623-1	Mean Platelet Volume (MPV)	fL	7.0 – 12.0	M/F	
751-8	Neutrophils	x10 ⁹ /L	2.0 – 8.0	M/F	
26507-4	Band Forms	x10 ⁹ /L	0.0 – 0.5	M/F	
731-0	Lymphocytes	x10 ⁹ /L	1.0 – 3.5	M/F	
742-7	Monocytes	x10 ⁹ /L	0.2 – 1.0	M/F	
711-2	Eosinophils	x10 ⁹ /L	0.0 – 0.5	M/F	
704-7	Basophils	x10 ⁹ /L	0.0 – 0.2	M/F	
4679-7	Reticulocytes	x10 ⁹ /L	20 - 100	M/F	
4537-7	Erythrocyte Sedimentation Rate (ESR)	mm in one hour	1 – 12	M	
			1 - 19	F	
COAGULATION					
6301-6	International Normalised Ratio (INR)	Ratio		M/F	The INR should only be applied to patients receiving anticoagulant therapy and is not valid in any other clinical situations (RCPA manual 2001). See Below.
<p>For patients not on warfarin, no reference range or normal range for INR is available. The INR is a ratio and is specifically set up for warfarin patients, who instead have a therapeutic range, which is individualised depending on various clinical factors.</p> <p>Prothrombin time (PT) is a better indication for coagulation in this setting, for which we do provide a normal range for PT, as we do for our other routine coagulation tests APTT and fibrinogen.</p> <p>Please contact PathTrials@austin.org.au if this is not sufficient, and your enquiry will be triaged.</p>					
5902-2	PT (Prothrombin Time)	seconds	11 -15	M/F	Not on anticoagulant therapy
14979-9	APTT (Activated Partial Thromboplastin Time)	seconds	22 - 38	M/F	Not on anticoagulant therapy
3255-7	Fibrinogen (Clauss)	g/L	2.0 - 4.0	M/F	
48065-7	D Dimer	ng/ml	<500	M/F	
BIOCHEMISTRY					
2951-2	Sodium	mmol/L	135 - 144	M/F	1 week - 18 Years Old
			135 - 145	M/F	≥18 Years Old
2823-3	Potassium	mmol/L	3.6 - 5.3	M/F	2 - 18 Years Old
			3.5 - 5.2	M/F	≥19 Years Old
2075-0	Chloride	mmol/L	97 - 110	M/F	1 week - 18 Years Old



LOINC Code	Test	Units	Reference Range	Gender	Notes
			95 - 110	M/F	≥19 Years Old
1963-8	Bicarbonate	mmol/L	20 - 32	M/F	10 - 18 Years Old
			22 - 32	M/F	≥19 Years Old
22664-7	Urea	mmol/L	1.8-6.4	M/F	1 Month - 18 Years Old
			3.0 - 7.0	F	19 - 49 Years Old
			3.5 - 8.0	F	50 - 69 Years Old
			4.0 - 9.0	F	≥70 Years Old
			3.5 - 8.0	M	19 - 49 Years Old
			4.0 - 9.0	M	50 - 69 Years Old
			4.5 - 10	M	≥70 Years Old
14682-9	Creatinine	umol/L	50 - 110	M	15 - 18 Years Old
			60 - 110	M	≥19 Years Old
			38 - 82	F	15 - 18 Years Old
			45 - 90	F	≥19 Years Old
62238-1	Estimated GFR	mL/min/1.73m ²	>90	M/F	
6768-6	Alkaline Phosphatase (ALP)	U/L	50 - 220	M	17 - 18 Years Old
			45 - 150	M	19 - 21 Years Old
			45 - 170	F	17 - 18 Years Old
			35 - 140	F	19 - 21 Years Old
			30 - 110	M/F	≥22 Years Old
1743-4	Alanine Amino Transferase (ALT)	U/L	10 - 24	M	13 - 18 Years Old
			5 - 40	M	≥19 Years Old
			9 - 22	F	13 - 18 Years Old
			5 - 35	F	≥19 Years Old
2324-2	Gamma Glutamyl Transferase (GGT)	U/L	2 - 42	M	13 - 17 Years Old
			5 - 50	M	≥18 Years Old
			4 - 24	F	13-17 Years Old
			5 - 35	F	≥18 Years Old
14631-6	Total Bilirubin	umol/L	<21	M/F	≥28 Days Old
1751-7	Albumin	g/L	40 - 52	M	15 - 18 Years Old
			38 - 51	F	15 - 18 Years Old
			35 - 52	M/F	≥19 Years Old
2885-2	Total Protein	g/L	60 - 80	M/F	≥4 Years Old
10834-0	Globulins (calculated)	g/L	25 - 40	M/F	
14630-8	Indirect Bilirubin (unconjugated)	umol/L	<18	M/F	
14629-0	Direct Bilirubin (conjugated)	umol/L	<3.0	M/F	
30239-8	Aspartate Transaminase (AST)	U/L	16 - 37	M	12-18 Years Old
			5 - 35	M	≥19 Years Old
			15 - 28	F	12 - 18 Years Old
			5 - 30	F	≥19 Years Old
14804-9	Lactate Dehydrogenase (LD)	U/L	120 - 250	M/F	≥12 Years Old
1798-8	Amylase	U/L	28 - 100	M/F	
3040-3	Lipase	U/L	10 - 60	M/F	≥18 Years Old
2000-8	Calcium	mmol/L	2.10 - 2.60*	M/F	≥18 Years Old *Adjusted calcium: approximate value (adjusted to a standard 40g/L albumin). Note: only corrected if Alb 30 - 50 g/L.
14879-1	Phosphate (Inorganic Phosphate)	mmol/L	0.75 - 1.65	M/F	18 - 19 Years Old
			0.75 - 1.50	M/F	≥20 Years Old
2601-3	Magnesium	mmol/L	0.70 - 1.10	M/F	≥18 Years Old
2524-7	Lactate	mmol/L	0.5 - 2.2	M/F	
1988-5	C-Reactive Protein	mg/L	<5.0	M/F	
14933-6	Uric Acid	mmol/L	0.21 - 0.42	M	
			0.15 - 0.35	F	
2157-6	Creatinine Kinase	U/L	45 - 250	M	≤60 Years Old
			40 - 200	M	>60 Years Old
			30 - 150	F	
89579-7	Troponin I	ng/L	<10	F	
			<20	M	
14749-6	Glucose - Random	mmol/L	3.3 - 7.7	M/F	
14749-6	Glucose - Fasting	mmol/L	3.3 - 6.0	M/F	
59261-8	Glycated Haemoglobin (HbA1c)	%	<6.5	M/F	DCCT/NGSP Units
	Non Diabetic-diagnostic cut off for diabetes	mmol/mol	<48	M/F	IFCC Units
	Glycated Haemoglobin (HbA1c)	%	<7.0	M/F	DCCT/NGSP Units
	Diabetic - target for good glycaemic control	mmol/mol	<53	M/F	IFCC Units
2857-1	Prostate Specific Antigen (PSA)	ug/L	<2.5	M	≤49 Years Old
			<3.5	M	50 - 59 Years Old
			<4.5	M	60 - 64 Years Old
			<5.5	M	65 - 69 Years Old
			<6.5	M	≥70 Years Old
24108-3	CA19-9	U/mL	<35	M/F	
10334-1	CA-125	U/mL	<35	M/F	
6875-9	CA15-3	U/mL	<25	M/F	

LOINC Code	Test	Units	Reference Range	Gender	Notes
2039-6	CEA	ug/L	<5	M/F	No longer quoting a "smokers RI"
1834-1	Alphafoetoprotein (AFP)	kU/L	<7.4	M/F	
6771-0	Alpha-1-Antitrypsin	g/L	0.9 - 2.0	M/F	
21198-7	Beta- Human Chorionic Gonadotropin	IU/L	<5	F	Negative pregnancy
			5 - 25	F	Equivocal pregnancy
			>25	F	Positive pregnancy
			<2.6	M	Tumour marker
			<8.3	F	Tumour marker
11579-0	Thyroid Stimulating Hormone	mU/L	0.68 - 3.4	M/F	12 - 18 Years Old
			0.38 - 5.3	M/F	≥19 Years Old
14920-3	Free Thyroxine (FT4)	pmol/L	7.9 - 13.6	M/F	3 - 18 Years Old
			8.0 - 16.5	M/F	≥19 Years Old
14928-6	Free Tri-iodothyronine (FT3)	pmol/L	3.8 - 5.7	M	15 - 18 Years Old
			3.5 - 5.3	F	15 - 18 Years Old
			3.3 - 6.8	M/F	≥19 Years Old
14685-2	Vitamin B12	pmol/L	156 - 698	M/F	
14732-2	Serum Folate	nmol/L	>10.0	M/F	
14665-4	Copper	umol/L	11.8 - 22.8	M/F	≥ 11 Years
2064-7	Caeruloplasmin	g/L	0.2 - 0.6	M/F	
33958-0	Vitamin D (25OH)	nmol/L	>50	M/F	The level of 25 OH Vit D regarded as desirable for general health is >75 nmol/L
14798-3	Iron Concentration	umol/L	13 - 32	M	≥18 Years Old
			11 - 32	F	≥18 Years Old
3034-6	Transferrin	g/L	2.0 - 3.6	M/F	
14801-5	Transferrin Saturation	%	15 - 45	M/F	
2276-4	Ferritin	ug/L	30 - 340	M	
			30 - 400	F	
2865-4	Alpha 1 Globulin	g/L	2.1 - 3.5	M/F	
2868-8	Alpha 2 Globulin	g/L	5.1 - 8.5	M/F	
32730-4	Beta 1 Globulin	g/L	3.4 - 5.2	M/F	
32731-2	Beta 2 Globulin	g/L	2.3 - 4.7	M/F	
36916-5	Kappa Free LC	mg/L	3.3 - 19.4	M/F	
33944-0	Lambda Free LC	mg/L	5.7 - 26.3	M/F	
48378-4	K/L Ratio	ratio	0.26 - 1.65	M/F	
4542-7	Haptoglobin	g/L	0.3 - 2.0	M/F	
19113-0	IgE	kU/L	<114	M/F	≥18 Years Old
14674-6	ACTH - Adrenocorticotrophic Hormone	ng/L	7.2 - 63.3	M/F	
3298-7	Paracetamol (Acetaminophen)	mg/L	See comment	M/F	As of 20th January 2018, paracetamol concentrations are reported in mg/L. In the case of single acute ingestions treatment should be considered for concentrations of 150mg/l or greater at 4 hours post-ingestion.
1869-7	Apolipoprotein A1	g/L	1.05 - 2.05	M/F	
1884-6	Apolipoprotein B	g/L	0.55 - 1.30	M/F	
10835-7	Lipoprotein (a)	nmol/L	<32	M/F	
33762-6	N Terminal pro-BNP	ng/L	<125	M/F	
30169-7	Chromogranin A	ug/L	27 - 94	M/F	
1952-1	Beta 2 Microglobulin (B2M)	mg/L	0.8 - 2.4	M/F	≤60 Years Old
			0.8 - 3.0	M/F	>60 Years Old
42254-3	Anti-Nuclear Antibodies	Titre	<80	M/F	
	Methaemoglobin	%	<1.5	M/F	
32546-4	Glucose 6 Phosphate Dehydrogenase (G6PD)	U/g/Hb	10.1 - 14.2	M/F	≥1 Year Old
2465-3	IgG	g/L	3.27 - 12.7	M/F	0 - 1 Years Old
			4.68 - 12.5	M/F	2 - 3 Years Old
			5.32 - 13.4	M/F	4 - 5 Years Old
			4.54 - 13.6	M/F	6 - 7 Years Old
			5.68 - 13.6	M/F	8 - 9 Years Old
			5.68 - 14.9	M/F	10 - 11 Years Old
			6.64 - 14.9	M/F	12 - 13 Years Old
			5.5 - 14.4	M/F	14 - 17 Years Old
6.103 - 16.16	M/F	≥18 Years Old			
2458-8	IgA	g/L	0 - 0.83	M/F	< 1 Year Old
			0.2 - 1.0	M/F	1 - 3 Years Old
			0.27 - 1.95	M/F	4 - 6 Years Old
			0.34 - 3.05	M/F	7 - 9 Years Old
			0.53 - 2.04	M/F	10 - 11 Years Old
			0.58 - 3.58	M/F	12 - 13 Years Old
			0.47 - 2.49	M/F	14 - 15 Years Old
			0.61 - 3.48	M/F	16 - 18 Years Old
0.845 - 4.99	M/F	≥19 Years Old			
2472-9	IgM	g/L	0.21 - 2.15	M/F	0 - 1 Years Old

LOINC Code	Test	Units	Reference Range	Gender	Notes
			0.26 - 1.55	M/F	2 - 3 Years Old
			0.26 - 1.88	M/F	4 - 8 Years Old
			0.47 - 2.52	M/F	9 - 13 Years Old
			0.26 - 2.32	M/F	14 - 18 Years Old
			0.35 - 2.42	M/F	≥19 Years Old
The Following are targets for patients on lipid lowering therapy.					
14647-2	Cholesterol (Total)	mmol/L	<4.0	M/F	Treatment target for patients on lipid lowering therapy
14927-8	Triglycerides	mmol/L	<2.0	M/F	Treatment target for patients on lipid lowering therapy
14646-4	HDL Cholesterol	mmol/L	>1.0	M/F	Treatment target for patients on lipid lowering therapy
39469-2	LDL Cholesterol (calculated result)	mmol/L	<2.0	M/F	Treatment target for patients on lipid lowering therapy
70204-3	Non-HDL Cholesterol	mmol/L	<2.5	M/F	Treatment target for patients on lipid lowering therapy
The Following are targets for patients NOT on lipid lowering therapy (As published by AACB 2018)					
14647-2	Cholesterol (Total)	mmol/L	<5.5	M/F	
14927-8	Triglycerides	mmol/L	<2.0	M/F	
14646-4	HDL Cholesterol	mmol/L	>1.0	M	
			>1.2	F	
39469-2	LDL Cholesterol (calculated result)	mmol/L	<3.0	M/F	
70204-3	Non-HDL Cholesterol	mmol/L	<4.0	M/F	
INFECTIOUS SEROLOGY					
58900-2	HIV 1, 2 Serology		Negative	M/F	
16128-1	Hepatitis C Antibody		Negative	M/F	
5195-3	Hepatitis B Surface Antigen		Negative	M/F	
31204-1	Hepatitis B Core Antibody (Total)		Negative	M/F	
32019-2	Hepatitis B Surface Antibody	IU/mL	>10 IU/mL	M/F	Protective level of antibody
29615-2	Hepatitis B Viral Load (PCR)	IU/mL	Negative	M/F	
11011-4	Hepatitis C Viral Load (PCR)	IU/mL	Negative	M/F	
HORMONES					
14633-2	C-Peptide	nmol/L	0.24 - 1.46	M/F	Fasting
14675-3	Cortisol - Serum	nmol/L	185 - 624	M/F	6am - 10am
15067-2	Follicle Stimulating Hormone (FSH)	IU/L	3.85 - 8.78	F	Mid-Follicular
			4.54 - 22.5	F	Mid Cycle-Peak
			1.79 - 5.12	F	Mid-Luteal
			16.7 - 113.6	F	Post-Menopausal
			1.3 - 19.3	M	≥19 Years Old
20448-7	Insulin	mIU/L	1.9 - 23.0	M/F	
10501-5	Luteinizing Hormone (LH)	IU/L	2.12 - 10.89	F	Mid-Follicular
			19.2 - 103.0	F	Mid Cycle-Peak
			1.2 - 12.86	F	Mid-Luteal
			10.9 - 58.6	F	Post-Menopausal
			1.2 - 8.6	M	≥19 Years Old
14715-7	Oestradiol	pmol/L	98 - 422	F	Follicular
			118 - 1898	F	Mid-Cycle
			134 - 903	F	Luteal
			<92	F	Post-Menopausal
			<116	M	≥19 Years Old
14890-8	Progesterone	nmol/L	1.0 - 4.8	F	Follicular
			16.4 - 59.0	F	Luteal
			≤2.5	F	Post-Menopausal
			0.6 - 5.2	M	≥19 Years Old
20434-7	Prolactin	mIU/L	69 - 392	M/F	1 - 18 Years Old
			56 - 278	M	≥19 Years Old
			71 - 566	F	≥19 - <50 Years Old
			58 - 416	F	≥50 Years Old
14866-8	Parathyroid Hormone	pmol/L	1.6 - 6.0	M/F	16 - 50 Years Old
13967-5	Sex Hormone Binding Globulin	nmol/L	11 - 75	M	13 - 18 Years Old
			13 - 90	M	≥19 Years Old
			18 - 96	F	13 - 18 Years Old
			18 - 135	F	19 - <50 Years Old
			17 - 125	F	≥50 Years Old
14913-8	Testosterone	nmol/L	0.4 - 19.6	M	12 - 18 Years Old
			9.0 - 28.3	M	≥19 Years Old
			0.6 - 3.0	F	15 - 18 Years Old
			<2.6	F	≥19 Years Old
URINE - DIPSTICK					
50555-2	Glucose		Negative	M/F	
20454-5	Protein		Negative	M/F	
5803-2	pH		5.0 - 8.5	M/F	
5811-5	Specific Gravity		1.005 - 1.030	M/F	

LOINC Code	Test	Units	Reference Range	Gender	Notes
5799-2	Leucocyte Esterases		Negative	M/F	
2514-8	Ketones		Negative	M/F	
5802-4	Nitrites		Negative	M/F	
5770-3	Bilirubin		Negative	M/F	
50041-3	Urobilinogen	umol/L	3.2-16.0	M/F	
5794-3	Blood/HB		Negative	M/F	
URINE - MICROSCOPY					
46702-7	Leucocytes	Cell x 10 x 10 ⁶ /L	<10 x 10 ⁶ /L	M/F	
46419-8	Erythrocytes	Cell x 10 x 10 ⁶ /L	<13 x 10 ⁶ /L	M/F	
	Casts (Excluding Hyaline Casts)	-	Negative	M/F	The presence of any cast EXCEPT Hyaline Casts, is considered abnormal.
URINE - BIOCHEMISTRY					
2164-2	24 Hour Urine - Creatinine Clearance	mL / Minute	90 - 150	M/F	
32294-1	Random Urine Albumin : Creatinine Ratio	mg/mmol	< 2.5	M	
			<3.5	F	
40661-1	Urinary Bence Jones Protein/Free Light Chain		Negative	M/F	The presence of any Bence Jones Protein or free light chain is abnormal in urine.

LOINC codes were last updated 20th May 2024. Changes to testing methodology may alter the LOINC code applicable to each test.