Pathology First Biochemistry Reference Intervals

For results or sample enquiries please contact Pathology First results enquiry lines on 01268 968273 or 01268 968279 - 9am - 6pm

Code	Test name	Sex	Age	Reference Range	Units	Source	Comment
NA	Sodium			(133 - 146)	mmol/L	Pathology Harmony	
K	Potassium			(3.5 - 5.3)	mmol/L	Pathology Harmony	
CL	Chloride			(95 - 108)	mmol/L	Pathology Harmony	
UREA	Urea		30d	(0.8 - 5.5)	mmol/L	Pathology Harmony	
			1	(1.0 - 5.5)			
			16	(2.5 - 6.5)			
				(2.5 - 7.8)			
CREA	Creatinine	M/F	30d	(22 - 90)	umol/L	Beckman	
			2	(11 - 34)			
			14	(21 - 65)			
		M	18	(59 - 98)		Back calculated from eGFR	
			28	(59 - 135)			
			40	(59 - 124)			
			54	(59 - 117)			
			67	(59 - 111)			
			79	(59 - 107)			
			88	(59 - 104)			
			150	(59 - 104)			
		F	18	(45 - 83)			
			29	(45 - 104)			
			43	(45 - 95)			
			56	(45 - 89)			
			65	(45 - 85)			
			78	(45 - 83)			
			86	(45 - 80)			
			150	(45 - 78)			
EGFR	Estimated Glomerular Filtration rate			(>60)	ml/min/1.73m2		
BIC	Bicarbonate		16	(19 - 28)	mmol/L	Pathology Harmony	
			120	(22 - 29)			
PHOS	Phosphate		30d	(1.3 - 2.6)	mmol/L	Pathology Harmony	
			12m	(1.3 - 2.4)			
			16	(0.9 - 1.8)			
				(0.8 - 1.5)			
TP	Total Protein			(60 - 80)	g/L	Pathology Harmony	
ALB	Albumin		12M	(30 - 45)	g/L	Pathology Harmony	
ALB			16	(30 - 50)			
				(35 - 50)			
GLOB	Globulins			(20 - 35)	g/L		
ALT	ALT	M		(<50)	u/L	Beckman	
		F		(<35)			
ACA	Adjusted calcium		30d	(2.0 - 2.7)	mmol/L	Pathology Harmony	
			16	(2.2 - 2.7)			
				(2.2 - 2.6)			
CRP	C Reactive protein			(< 5)	mg/L	Beckman	
B12	Vitamin B12			(120 - 900)	ng/L	Local data	From 01/08/17
FERR	Ferritin			(15 - 300)	ng/mL	Regional	
GLU	Glucose (random)			(< 11.1)	mmol/L	World Health Organisation	
FGLU	Glucose (fasting)			(3.5 - 6.0)	mmol/L	Beckman	
CK	CK	M		(< 320)	u/L	Pathology Harmony	
		F		(< 200)			
CKMB	CKMB			(0 - 24)	u/L	Beckman	
AMY	Amylase			(28 - 100)	u/L	Beckman	
GGT	Gamma Glutamyl Transferase	M		(<55)	u/L	Beckman	
		F		(<38)			
MG	Magnesium		30d	(0.6 - 1.0)	mmol/L	Pathology Harmony	
			>30 days	(0.7 - 1.0)			
AST	AST	F		(<35)	u/L	Beckman	
		M		(<50)	u/L		
URA	Urate	M		(200 - 430)	umol/L	Pathology Harmony	
		F		(140 - 360)			
BA	Bile acids			(0 - 14)	umol/L	Beckman	
ALP	Alkaline Phosphatase		30d	(70 - 380)	u/L	Pathology Harmony	
			16	(60 - 425)			
				(30 - 130)			
BILI	Bilirubin (Total)		14d	no range	umol/L	n/a Pathology Harmony	
			>14 days	(0 - 21)			
CBIL	Conjugated bilirubin			(<3.4)	umol/L	Beckman	
FOL	Folate			(> 2.5)	ug/L	Regional	
TSH	Thyroid Stimulating Hormone		20d	no range	mu/L	n/a	
			11y	(0.79 - 5.85)		Caliper	
			>11 years	(0.3 - 5.0)		Leeds Study	
FT4	FT4		20d		pmol/L	n/a	
			>20 days	(7.9 - 16)		Local study	Implemented 10/07/2017
				In pregnancy, the lower limit of normal for FT4 is: 1st trimester 6.7 2nd trimester 5.8 3rd trimester 6.1		Beckman	

Code	Test name	Sex	Age	Reference Range	Units	Source	Comment
FT3	FT3		20d		pmol/L	Beckman	
			>20 days	(3.8 - 6.0)			
BNP	NT-proBNP		75 yrs	(< 300)	ng/L	NICE	CHF thresholds for referral to Echocardiography in primary care
BNP			>75 yrs	(< 450)			
SALI	Salicylate			undetectable	mg/L	n/a	
LACT	Lactate			(0.6 - 2.5)	mmol/L	Pathology Harmony	
IRON	Iron	F		(10 - 30)	umol/L	Pathology Harmony	
TRAN	Transferrin			(2.0 - 3.6)	g/L	Regional	
TSAT	Transferrin Saturation	F		(15 - 45)	%	BSCH Guidelines Genetic Haemochromatosis 2000/EASL Clinical Practice Guidelines for HFE Hemochromatosis. J Hepatol (2010)	
		M		(15 - 50)	%		
DIG	Digoxin			(0.8 - 2.0)	ug/L	Pathology Harmony	
GENT	Gentamicin			see guidance	mg/L	n/a	
VANC	Vancomycin			see guidance	mg/L	n/a	
AMIK	Amikacin			see guidance	mg/L	n/a	
IGA	Immunoglobulin A		14d	(0.01 - 0.08)	g/L	Protein Reference Unit	
			44d	(0.02 - 0.15)			
			3m	(0.05 - 0.4)			
			6m	(0.10 - 0.5)			
			9m	(0.15 - 0.7)			
			1	(0.20 - 0.7)			
			2	(0.30 - 1.2)			
			3	(0.30 - 1.3)			
			6	(0.40 - 2.0)			
			9	(0.50 - 2.4)			
			12	(0.70 - 2.5)			
			15	(0.80 - 2.8)			
			45	(0.80 - 2.8)			
				(0.80 - 4.0)			
IGG	Immunoglobulin G		14d	(5.0 - 17.0)	g/L	Protein Reference Unit	
			44d	(3.9 - 13.0)			
			3m	(2.1 - 7.7)			
			6m	(2.4 - 8.8)			
			9m	(3.0 - 9.0)			
			1	(3.0 - 10.9)			
			2	(3.1 - 13.8)			
			3	(3.7 - 15.8)			
			6	(4.9 - 16.1)			
			9	(5.4 - 16.1)			
			12	(5.4 - 16.1)			
			15	(5.4 - 16.1)			
			45	(6.0 - 16.0)			
				(6.0 - 16.0)			
IGM	Immunoglobulin M		14d	(0.05 - 0.20)	g/L	Protein Reference Unit	
			44d	(0.08 - 0.40)			
			3m	(0.15 - 0.70)			
			6m	(0.20 - 1.00)			
			9m	(0.40 - 1.60)			
			1	(0.60 - 2.10)			
			2	(0.50 - 2.20)			
			3	(0.50 - 2.20)			
			6	(0.50 - 2.00)			
			12	(0.50 - 1.80)			
			15	(0.50 - 1.90)			
			45	(0.50 - 1.90)			
			>45 yrs	(0.50 - 2.00)			
AAT	Alpha 1 antitry[sin		6m	(0.8 - 1.8)	g/L	Protein Reference Unit	
			1	(1.1 - 2.0)			
			5	(1.1 - 2.2)			
			10	(1.4 - 2.3)			
			15	(1.2 - 2.0)			
			>15 yrs	(1.1 - 2.1)			
PSA	Prostate Specific Antigen	M	69	(< 3.0)	ug/L	UKNSC Screening for Prostate Cancer Review	
			79	(< 5.0)			
				See comments		Local agreement with Urology Teams	
HCG	Human Chorionic Gonadotrophin	F		(< 5)	u/L	Beckman	
		M		(< 5)			
LH	Luteinising Hormone	M/F	11y		u/L	n/a	
		F	>11 years	see comment		Beckman	
		M		(1.2 - 8.6)			
FSH	Follicle Stimulating Hormone	M/F	11y		u/L	n/a	
		F	>11 years	see comment	u/L	Beckman	
		M		(1.3 - 19.3)	u/L		
OEST	Oestradiol	M	12M	(<193)	pmol/L	Caliper	
			11y	(<73)	pmol/L		
			>11 years	(<173)	pmol/L	Beckman	
		F	12M	(<193)	pmol/L	Caliper	
			11	(<73)	pmol/L		
			>11 years	see comment	pmol/L	Beckman	

Code	Test name	Sex	Age	Reference Range	Units	Source	Comment
PROG	Progesterone	F		See comment	nmol/L	Beckman	Mid luteal (Day 21) Progesterone levels:- Ovulation unlikely <16 nmol/L Ovulation possible: 16 – 30 nmol/L Ovulation probable: >30 nmol/L
PTH	Parathyroid Hormone			(1.3 - 9.3)	pmol/L	Beckman	
VITD	Vitamin D			(Sufficient 76 - 150 nmol/L)	nmol/L	Holick MF et al. Evaluation, Treatment, and Prevention of Vitamin D Deficiency: An Endocrine Society Clinical Practice Guideline, J Clin Endocrinol Metab 2011; 96 (7): 1911-1930.	
TES	Testosterone	M	1.5y	(<9.85)	nmol/L	Caliper	
			6	(<0.35)			
			8	(<0.62)			
			11	(<1.63)			
			101	(6.1 - 27.1)		Beckman	
		F	1.5y	(<2.19)		Caliper	
			6	(<0.35)			
			8	(<0.62)			
			11	(<1.63)			
			101	(<2.4)		Beckman	
FAI	Free Androgen Index	M	17	no range in paeds 17yrs and below			
			>17 years	(24 - 110)	nmol/L	Beckman	
		F	16	no range in paeds 16yrs and below		n/a	
			46	(<11)	nmol/L	Beckman	
			101	(<7)			
SHBG	Sex Hormone Binding Globulin	M	30d	(12 - 116)	nmol/L	Caliper	
			12m	(>32)			
			7	(53 - 174)			
			10	(45 - 144)			
			12	(16 - 132)			
			101	(13 - 90)		Beckman	
		F	30d	(12 - 116)		Caliper	
			12m	(>32)			
			7	(53 - 174)			
			10	(45 - 144)			
			12	(16 - 132)			
			46	(18 - 136)			
			101	(17 - 125)		Beckman	
CHOL	Cholesterol			none quoted	mmol/L	n/a	
TRIG	Triglycerides			(< 2.26)	mmol/L	National Cholesterol Education Program (NCEP)	
HDL	High Density Lipoprotein			none quoted	mmol/L	n/a	
LDL	Low Density Lipoprotein			(< 3.0)	mmol/L		
TNT	Troponin T			(< 14)	ng/L	Roche	
PARA	Paracetamol			undetectable	mg/L	n/a	
ALC	Alcohol			undetectable	mg/dL	n/a	
OSM	Osmolality			(275 - 295)	mmol/kg	Pathology Harmony	
AMMO	Ammonia		1M	Sick or prem <150, neonate <100	umol/L	Pathology Harmony	
			16	(<50)			
				(16 - 53)		Thermo Fisher	
RF	Rheumatoid Factor			(0 - 14)	u/mL	Beckman	
C3	Complement C3			(0.9 - 1.8)	g/L	Beckman	
C4	Complement C4			(0.14 - 0.54)	g/L	Protein Reference Unit	
HAPT	Haptoglobin			(0.3 - 2.0)	g/L	Beckman	
THEO	Theophylline			(10 - 20)	mg/L	Pathology Harmony	
LI	Lithium			(0.4 - 1.0)	mmol/L	Pathology Harmony	
PHNY	Phenytoin			(5 - 20)	mg/L	Pathology Harmony	
CARB	Carbamazepine			(4 - 12)	mg/L	Pathology Harmony	
CYC	Cyclosporin			see report	ug/L	n/a	
C125	Ca125 (Roche)			(< 35)	ku/L	NICE CG122 Ovarian cancer	
	Ca125 (Beckman)						
CEA	CEA (Roche)			(< 5)	ug/L	Roche	
	CEA (Beckman)			(<3)		Beckman	
C199	Ca 19-9 (Roche)			(< 33)	ku/L	historical	
	Ca 19-9 (Beckman)			(< 35)	ku/L	Beckman	
C153	Ca 15-3 (Charing Cross)			(< 32)	ku/L	Referral Lab	
	Ca 15-3 (Beckman)			(< 31)	ku/L	Beckman	
AFP	Alpha fetoprotein (Roche)			(< 7.5)	ku/L	historical	
	Alpha fetoprotein (Beckman)			(< 7.4)	ku/L	Beckman	
LDH	Lactate Dehydrogenase		5d	(<1732)	u/L	Beckman	
			6m	(<975)			
			6	(<615)			
			>6 yrs	(208 - 378)			
CORT	Cortisol			(185 - 624)	nmol/L	Beckman	Early morning sample
IGE	Total IgE			See report	ku/L		

Code	Test name	Sex	Age	Reference Range	Units	Source	Comment
PRL	Prolactin	F		see report	mu/L	Beckman	
		M		<278			
BPPP	Bioactive prolactin	F		(< 469)	mu/L	Beltran et al., Clinical Chemistry, 2008, 54:10 1773-1681	
		M		(< 301)		Beltran et al., Clinical Chemistry, 2008, 54:10 1773-1681	
CTP	CSF Total protein		30d	(0.15 - 1.30)	g/L	Beckman	
			>30d	(0.15 - 0.45)			
CLAC	CSF Lactate		10d	(1.1 - 4.4)	mmol/L	Beckman	
			17	(1.1 - 2.8)			
			>17	(1.1 - 2.4)			
24NA	Urine Sodium (24hr)			(40 - 220)	mmol/24hr	Beckman	
24K	Urine Potassium (24hr)			(25 - 125)	mmol/24hr	Beckman	
24CL	Urine Chloride (24hr)			none quoted	mmol/24hr	n/a	
24UR	Urine Urea (24hr)			(250 - 570)	mmol/24hr	Beckman	
24CR	Urine Creatinine (24hr)			none quoted	mmol/24hr	n/a	
UALB	Urine Albumin			See ACR		n/a	
ALCR	Urine Albumin Creatinine ratio			(<3)	mg/mmol	NICE CG182 CKD	
24TP	Urine Total protein (24hr)			(<0.1)	mmol/24hr	Beckman	
UPCR	Urine protein creatinine ratio			(<15)	mg/mmol	Renal Association Guidelines Proteinuria	From August 2017
24PH	Urine Phosphate (24hr)			(15 - 50)	mmol/24hr	Pathology Harmony	
24UA	Urine Uric acid (24hr)			(1.5 - 4.5)	mmol/24hr	Pathology Harmony	
24CA	Urine Calcium (24hr)			(2.5 - 7.5)	mmol/24hr	Pathology Harmony	
24MG	Urine magnesium (24hr)			(2.4 - 6.5)	mmol/24hr	Pathology Harmony	

Key:

Pathology Harmony - a national intiative supported by the DOH, established to identify areas of athology that could be harmonised including reference intervals.
Manufacturers of test provide specific reference ranges:
Roche
Beckman
Thermo Fisher
Protein Reference Unit - Referral laboratory specialising in protein testing
Caliper study - A Canadian initiative to create a comprehensive database of normal reference values for a wide range of biochemical markers in children
Leeds Study - A reference range study of thyroid function tests