

## Haematology Reference Ranges

FBC Age range 0-1 days				
Test	Criteria	Low reference	High reference	Units
White Blood Cell count		10	26	$\times 10^9/L$
Red Blood Cell count	Male	5	7	$\times 10^{12}/L$
	Female	5	7	$\times 10^{12}/L$
Haemoglobin	Male	140	220	g/L
	Female	140	220	g/L
	Unknown	140	220	g/L
Haematocrit (HCT)	Male	0.45	0.75	ratio
	Female	0.45	0.75	ratio
	Unknown	0.45	0.75	ratio
Mean Cell Volume (MCV)		100	120	fL
Mean Cell Haemoglobin (MCH)		31	37	pg
Mean Cell Haemoglobin Concentration (MCHC)		300	360	g/L
Platelet count		100	450	$\times 10^9/L$
Neutrophil count		4	14	$\times 10^9/L$
Lymphocyte count		3	8	$\times 10^9/L$
Monocyte count		0.5	2	$\times 10^9/L$
Eosinophil count		0.1	1	$\times 10^9/L$
Basophil count		0	0.1	$\times 10^9/L$
Nucleated Red Blood Cell count		0	0.1	$\times 10^9/L$
Reticulocyte count		50	100	$\times 10^9/L$

FBC Age range 1-3 days				
Test	Criteria	Low reference	High reference	Units
White Blood Cell count		10	26	$\times 10^9/L$
Red Blood Cell count	Male	5	7	$\times 10^{12}/L$
	Female	5	7	$\times 10^{12}/L$
Haemoglobin	Male	140	220	g/L
	Female	140	220	g/L
	Unknown	140	220	g/L
Haematocrit (HCT)	Male	0.45	0.75	ratio
	Female	0.45	0.75	ratio

	Unknown	0.45	0.75	ratio
Mean Cell Volume (MCV)		100	120	fL
Mean Cell Haemoglobin (MCH)		31	37	pg
Mean Cell Haemoglobin Concentration (MCHC)		300	360	g/L
Platelet count		100	450	x 10 <sup>9</sup> /L
Neutrophil count		4	14	x 10 <sup>9</sup> /L
Lymphocyte count		3	8	x 10 <sup>9</sup> /L
Monocyte count		0.5	2	x 10 <sup>9</sup> /L
Eosinophil count		0.1	1	x 10 <sup>9</sup> /L
Basophil count		0	0.1	x 10 <sup>9</sup> /L
Nucleated Red Blood Cell count		0	0.1	x 10 <sup>9</sup> /L
Reticulocyte count		50	100	x 10 <sup>9</sup> /L

FBC Age range 4-7 days				
Test	Criteria	Low reference	High reference	Units
White Blood Cell count		7	23	x 10 <sup>9</sup> /L
Red Blood Cell count	Male	4	6.6	x 10 <sup>12</sup> /L
	Female	4	6.6	x 10 <sup>12</sup> /L
Haemoglobin	Male	150	210	g/L
	Female	150	210	g/L
	Unknown	150	210	g/L
Haematocrit (HCT)	Male	0.45	0.67	ratio
	Female	0.45	0.67	ratio
	Unknown	0.45	0.67	ratio
Mean Cell Volume (MCV)		92	118	fL
Mean Cell Haemoglobin (MCH)		31	37	pg
Mean Cell Haemoglobin Concentration (MCHC)		290	370	g/L
Platelet count		210	500	x 10 <sup>9</sup> /L
Neutrophil count		1.5	6.9	x 10 <sup>9</sup> /L
Lymphocyte count		2	8	x 10 <sup>9</sup> /L
Monocyte count		0.5	2	x 10 <sup>9</sup> /L
Eosinophil count		0.1	2	x 10 <sup>9</sup> /L
Basophil count		0	0.1	x 10 <sup>9</sup> /L
Nucleated Red Blood Cell count		0	0.1	x 10 <sup>9</sup> /L
Reticulocyte count		50	100	x 10 <sup>9</sup> /L

FBC Age range 8-14 days				
Test	Criteria	Low reference	High reference	Units
White Blood Cell count		6	22	$\times 10^9/L$
Red Blood Cell count	Male	3.9	6.3	$\times 10^{12}/L$
	Female	3.9	6.3	$\times 10^{12}/L$
Haemoglobin	Male	135	215	g/L
	Female	135	215	g/L
	Unknown	135	215	g/L
Haematocrit (HCT)	Male	0.42	0.66	ratio
	Female	0.42	0.66	ratio
	Unknown	0.42	0.66	ratio
Mean Cell Volume (MCV)		88	126	fL
Mean Cell Haemoglobin (MCH)		31	37	pg
Mean Cell Haemoglobin Concentration (MCHC)		280	380	g/L
Platelet count		160	500	$\times 10^9/L$
Neutrophil count		1.5	6.9	$\times 10^9/L$
Lymphocyte count		3	9	$\times 10^9/L$
Monocyte count		0.1	1.7	$\times 10^9/L$
Eosinophil count		0	0.8	$\times 10^9/L$
Basophil count		0	0.1	$\times 10^9/L$
Nucleated Red Blood Cell count		0	0.1	$\times 10^9/L$
Reticulocyte count		50	100	$\times 10^9/L$

FBC Age range 15 days - 4 weeks				
Test	Criteria	Low reference	High reference	Units
White Blood Cell count		6	22	$\times 10^9/L$
Red Blood Cell count	Male	3.6	6.2	$\times 10^{12}/L$
	Female	3.6	6.2	$\times 10^{12}/L$
Haemoglobin	Male	125	205	g/L
	Female	125	205	g/L
	Unknown	125	205	g/L
Haematocrit (HCT)	Male	0.39	0.63	ratio
	Female	0.39	0.63	ratio
	Unknown	0.39	0.63	ratio

Mean Cell Volume (MCV)		86	124	fL
Mean Cell Haemoglobin (MCH)		31	37	pg
Mean Cell Haemoglobin Concentration (MCHC)		280	380	g/L
Platelet count		170	500	$\times 10^9/L$
Neutrophil count		1.5	6.9	$\times 10^9/L$
Lymphocyte count		3	9	$\times 10^9/L$
Monocyte count		0.1	1.7	$\times 10^9/L$
Eosinophil count		0.1	0.9	$\times 10^9/L$
Basophil count		0	0.1	$\times 10^9/L$
Nucleated Red Blood Cell count		0	0.1	$\times 10^9/L$
Reticulocyte count		50	100	$\times 10^9/L$

FBC Age range 4- 8 weeks				
Test	Criteria	Low reference	High reference	Units
White Blood Cell count		5	15	$\times 10^9/L$
Red Blood Cell count	Male	3	5.4	$\times 10^{12}/L$
	Female	3	5.4	$\times 10^{12}/L$
Haemoglobin	Male	115	165	g/L
	Female	115	165	g/L
	Unknown	115	165	g/L
Haematocrit (HCT)	Male	0.33	0.53	ratio
	Female	0.33	0.53	ratio
	Unknown	0.33	0.53	ratio
Mean Cell Volume (MCV)		92	116	fL
Mean Cell Haemoglobin (MCH)		27	33	pg
Mean Cell Haemoglobin Concentration (MCHC)		285	355	g/L
Platelet count		200	500	$\times 10^9/L$
Neutrophil count		1.5	6.9	$\times 10^9/L$
Lymphocyte count		3	16	$\times 10^9/L$
Monocyte count		0.3	1	$\times 10^9/L$
Eosinophil count		0.2	1	$\times 10^9/L$
Basophil count		0	0.1	$\times 10^9/L$
Nucleated Red Blood Cell count		0	0	$\times 10^9/L$
Reticulocyte count		50	100	$\times 10^9/L$

FBC Age range 8-12 weeks				
Test	Criteria	Low reference	High reference	Units
White Blood Cell count		5	15	$\times 10^9/L$
Red Blood Cell count	Male	3	5.4	$\times 10^{12}/L$
	Female	3	5.4	$\times 10^{12}/L$
Haemoglobin	Male	115	165	g/L
	Female	115	165	g/L
	Unknown	115	165	g/L
Haematocrit (HCT)	Male	0.33	0.53	ratio
	Female	0.33	0.53	ratio
	Unknown	0.33	0.53	ratio
Mean Cell Volume (MCV)		92	116	fL
Mean Cell Haemoglobin (MCH)		27	33	pg
Mean Cell Haemoglobin Concentration (MCHC)		285	355	g/L
Platelet count		200	500	$\times 10^9/L$
Neutrophil count		1.5	6.9	$\times 10^9/L$
Lymphocyte count		3	16	$\times 10^9/L$
Monocyte count		0.3	1	$\times 10^9/L$
Eosinophil count		0.2	1	$\times 10^9/L$
Basophil count		0	0.1	$\times 10^9/L$
Nucleated Red Blood Cell count		0	0	$\times 10^9/L$
Reticulocyte count		50	100	$\times 10^9/L$

FBC Age range 12-24 weeks				
Test	Criteria	Low reference	High reference	Units
White Blood Cell count		5	19	$\times 10^9/L$
Red Blood Cell count	Male	3.1	4.3	$\times 10^{12}/L$
	Female	3.1	4.3	$\times 10^{12}/L$
Haemoglobin	Male	94	130	g/L
	Female	94	130	g/L
	Unknown	94	130	g/L
Haematocrit (HCT)	Male	0.28	0.42	ratio
	Female	0.28	0.42	ratio
	Unknown	0.28	0.42	ratio
Mean Cell Volume (MCV)		87	103	fL

Mean Cell Haemoglobin (MCH)		27	33	pg
Mean Cell Haemoglobin Concentration (MCHC)		290	370	g/L
Platelet count		210	650	$\times 10^9/L$
Neutrophil count		1	5	$\times 10^9/L$
Lymphocyte count		4	10	$\times 10^9/L$
Monocyte count		0.4	1.2	$\times 10^9/L$
Eosinophil count		0.1	1	$\times 10^9/L$
Basophil count		0	0.1	$\times 10^9/L$
Nucleated Red Blood Cell count		0	0	$\times 10^9/L$
Reticulocyte count		50	100	$\times 10^9/L$

FBC Age range 24 weeks - 1 year				
Test	Criteria	Low reference	High reference	Units
White Blood Cell count		6	18	$\times 10^9/L$
Red Blood Cell count	Male	4.1	5.3	$\times 10^{12}/L$
	Female	4.1	5.3	$\times 10^{12}/L$
Haemoglobin	Male	111	141	g/L
	Female	111	141	g/L
	Unknown	111	141	g/L
Haematocrit (HCT)	Male	0.3	0.38	ratio
	Female	0.3	0.38	ratio
	Unknown	0.3	0.38	ratio
Mean Cell Volume (MCV)		68	84	fL
Mean Cell Haemoglobin (MCH)		24	30	pg
Mean Cell Haemoglobin Concentration (MCHC)		300	360	g/L
Platelet count		200	550	$\times 10^9/L$
Neutrophil count		1	6	$\times 10^9/L$
Lymphocyte count		4	10	$\times 10^9/L$
Monocyte count		0.2	1.2	$\times 10^9/L$
Eosinophil count		0.1	1	$\times 10^9/L$
Basophil count		0	0.1	$\times 10^9/L$
Nucleated Red Blood Cell count		0	0	$\times 10^9/L$
Reticulocyte count		50	100	$\times 10^9/L$

FBC Age range 1-2 years				
Test	Criteria	Low reference	High reference	Units
White Blood Cell count		6	16	$\times 10^9/L$
Red Blood Cell count	Male	3.9	5.1	$\times 10^{12}/L$
	Female	3.9	5.1	$\times 10^{12}/L$
Haemoglobin	Male	111	141	g/L
	Female	111	141	g/L
	Unknown	111	141	g/L
Haematocrit (HCT)	Male	0.3	0.38	ratio
	Female	0.3	0.38	ratio
	Unknown	0.3	0.38	ratio
Mean Cell Volume (MCV)		72	84	fL
Mean Cell Haemoglobin (MCH)		25	29	pg
Mean Cell Haemoglobin Concentration (MCHC)		320	360	g/L
Platelet count		200	550	$\times 10^9/L$
Neutrophil count		1	7	$\times 10^9/L$
Lymphocyte count		3.5	11	$\times 10^9/L$
Monocyte count		0.2	1	$\times 10^9/L$
Eosinophil count		0.1	1	$\times 10^9/L$
Basophil count		0	0.1	$\times 10^9/L$
Nucleated Red Blood Cell count		0	0	$\times 10^9/L$
Reticulocyte count		50	100	$\times 10^9/L$

FBC Age range 2-6 years				
Test	Criteria	Low reference	High reference	Units
White Blood Cell count		5	15	$\times 10^9/L$
Red Blood Cell count	Male	4	5.2	$\times 10^{12}/L$
	Female	4	5.2	$\times 10^{12}/L$
Haemoglobin	Male	110	140	g/L
	Female	110	140	g/L
	Unknown	110	140	g/L
Haematocrit (HCT)	Male	0.34	0.4	ratio
	Female	0.34	0.4	ratio
	Unknown	0.34	0.4	ratio
Mean Cell Volume (MCV)		75	87	fL

Mean Cell Haemoglobin (MCH)		24	30	pg
Mean Cell Haemoglobin Concentration (MCHC)		310	370	g/L
Platelet count		200	490	$\times 10^9/L$
Neutrophil count		1.5	8	$\times 10^9/L$
Lymphocyte count		1.5	8.5	$\times 10^9/L$
Monocyte count		0.2	1	$\times 10^9/L$
Eosinophil count		0.1	1	$\times 10^9/L$
Basophil count		0	0.1	$\times 10^9/L$
Nucleated Red Blood Cell count		0	0	$\times 10^9/L$
Reticulocyte count		50	100	$\times 10^9/L$

FBC Age range 6-12 years				
Test	Criteria	Low reference	High reference	Units
White Blood Cell count		5	13	$\times 10^9/L$
Red Blood Cell count	Male	4	5.2	$\times 10^{12}/L$
	Female	4	5.2	$\times 10^{12}/L$
Haemoglobin	Male	115	155	g/L
	Female	115	155	g/L
	Unknown	115	155	g/L
Haematocrit (HCT)	Male	0.35	0.45	ratio
	Female	0.35	0.45	ratio
	Unknown	0.35	0.45	ratio
Mean Cell Volume (MCV)		77	95	fL
Mean Cell Haemoglobin (MCH)		25	33	pg
Mean Cell Haemoglobin Concentration (MCHC)		310	370	g/L
Platelet count		170	450	$\times 10^9/L$
Neutrophil count		2	8	$\times 10^9/L$
Lymphocyte count		1	5	$\times 10^9/L$
Monocyte count		0.2	1	$\times 10^9/L$
Eosinophil count		0.1	1	$\times 10^9/L$
Basophil count		0	0.1	$\times 10^9/L$
Nucleated Red Blood Cell count		0	0	$\times 10^9/L$
Reticulocyte count		50	100	$\times 10^9/L$



FBC Age range 12-120 years				
Test	Criteria	Low reference	High reference	Units
White Blood Cell count		4	10	$\times 10^9/L$
Red Blood Cell count	Male	4.5	5.5	$\times 10^{12}/L$
	Female	3.8	4.8	$\times 10^{12}/L$
Haemoglobin	Male	130	170	g/L
	Female	120	150	g/L
	Unknown	130	170	g/L
Haematocrit (HCT)	Male	0.4	0.5	ratio
	Female	0.36	0.46	ratio
	Unknown	0.36	0.5	ratio
Mean Cell Volume (MCV)		83	101	fL
Mean Cell Haemoglobin (MCH)		27	32	pg
Mean Cell Haemoglobin Concentration (MCHC)		315	345	g/L
Platelet count		150	410	$\times 10^9/L$
Neutrophil count		2	7	$\times 10^9/L$
Lymphocyte count		1	3	$\times 10^9/L$
Monocyte count		0.2	1	$\times 10^9/L$
Eosinophil count		0.02	0.5	$\times 10^9/L$
Basophil count		0	0.1	$\times 10^9/L$
Nucleated Red Blood Cell count		0	0	$\times 10^9/L$
Reticulocyte count		50	100	$\times 10^9/L$

	Criteria	Reference range	Units
Erythrocyte Sedimentation Rate (ESR)	Male 17 - 50 years	$\leq 10$	mm/hr
	Female 17 - 50 years	$\leq 12$	mm/hr
	Male 51- 60 years	$\leq 12$	mm/hr
	Female 51- 60 years	$\leq 19$	mm/hr
	Male 61-70 years	$\leq 14$	mm/hr
	Female 61 - 70 years	$\leq 20$	mm/hr
	Male >70 years	$\leq 30$	mm/hr
	Female >70 years	$\leq 35$	mm/hr

Coagulation	Low reference	High reference	Units
Activate Partial Thromboplastin Time (APTT)	23	37	seconds
Activated Protein C Resistance (APCR)	2.53	4.52	ratio
Antithrombin	80	127	%
D-Dimer			
D-Dimer results <243ng/mL are considered Negative for the diagnosis of VTE if patient is <50 years old. If patient is >50yrs use the age adjusted cut off = age x 10 ng/ml for interpretation. Always interpret all DDimer results together with the Wells Score (see NICE NG158).			
DRVVT	0.86	1.19	ratio
Fibrinogen Level	2	4.98	g/L
Protein C	79	169	%
Protein S	59	113	%
Prothrombin Time (PT)	11	15	seconds
Thrombin time	11	15	seconds

Haematinics	Low reference	High reference	Units
Serum Folate	8.83	60.8	nmol/L
Vitamin B12	145	569	pmol/L