Appendix XII

Normal Haematological Values (Expressed as Mean ± 2 SD (95% Range)

Red-cell count		
Men	$5.5 \pm 1.0 \times 10^{12}$/l	5.5 ± 1.0 millions/mm^3
Women	$4.8 \pm 1.0 \times 10^{12}$/l	4.8 ± 1.0 millions/mm^3
Infants (full-term, cord blood)	$5.0 \pm 1.0 \times 10^{12}$/l	5.0 ± 1.0 millions/mm^3
Children, 3 months	$4.0 \pm 0.8 \times 10^{12}$/l	4.0 ± 0.8 millions/mm^3
Children, 1 y	$4.4 \pm 0.8 \times 10^{12}$/l	4.4 ± 0.8 millions/mm^3
Children, 3-6 y	$4.8 \pm 0.7 \times 10^{12}$/l	4.8 ± 0.7 millions/mm^3
Children, 10-12 y	$4.7 \pm 0.7 \times 10^{12}$/l	4.7 ± 0.7 millions/mm^3
Haemoglobin		
Men	155 ± 25 g/l	15.5 ± 2.5 g/dl
Women	140 ± 25 g/l	14.0 ± 2.5 g/dl
Infants (full-term, cord blood)	165 ± 30 g/l	16.5 ± 3.0 g/dl
Children, 3 months	115 ± 20 g/l	11.5 ± 2.0 g/dl
Children, 1 y	120 ± 15 g/l	12.0 ± 1.5 g/dl
Children, 3-6 y	130 ± 10 g/l	13.0 ± 1.0 g/dl
Children, 10-12 y	130 ± 15 g/l	13.0 ± 1.5 g/dl
Packed cell volume (PCV; haematocrit value)		
Men	0.47 ± 0.07 (1/1)	47 ± 07 %
Women	0.42 ± 0.05 (1/1)	42 ± 05 %
Infants (full-term, cord blood)	0.54 ± 0.10 (1/1)	54 ± 10 %
Children, 3 months	0.38 ± 0.06 (1/1)	38 ± 06 %
Children, 3-6 y	0.40 ± 0.04 (1/1)	40 ± 04 %
Children 10-12 y	0.41 ± 0.04 (1/1)	41 ± 04 %
Mean cell volume (MCV)		
Adults	86 ± 10 fl	
Infants (full-term, cord blood)	106 fl (mean)	
Children, 3 months	95 fl (mean)	
Children, 1 y	78 ± 8 fl	
Children, 3-6 y	81 ± 8 fl	
Children, 10-12 y	84 ± 7 fl	
Mean cell haemoglobin (MCH)		
Adults	29.5 ± 2.5 pg	
Children, 3 months	29 ± 5 pg	
Children, 1 y	27 ± 4 pg	
Children, 3-6 y	27 ± 3 pg	
Children, 10-12 y	27 ± 3 pg	
Mean cell haemoglobin concentration (MCHC)		
Adults and children	325 ± 25 g/l	32.5 ± 2.5 g/dl

Red-cell diameter (mean values)		
Adults (dry films)	6.7-7.7micro m	
Red-cell density	1092 ± 1100 g/l	109.2 ± 110.0 g/dl
Reticulocytes		
Adults and children	0.2–2.0% (25-85 × 10^9/l)	0.2–2.0% (25-85 × 10^3/mm^3)
Infants (full-term, cord blood)	2- 6% (mean 150 × 10^9/l)	2– 6% (15000/mm^3)
Blood volume		
Red-cell volume, men	30 ± 5 ml/kg	
women	25 ± 5 ml/kg	
Plasma volume	45 ± 5 ml/kg	
Red-cell lifespan	120 ± 30 days	
Leucocyte count		
Adults	7.5 ± 3.5 × 10^9/l	7500 ± 3500/mm^3
Infants (full-term, 1st day)	18 ± 8 × 10^9/l	1800 ± 800/mm^3
Infants, 1 y	12 ± 6 × 10^9/l	1200 ± 600/mm^3
Children, 4-7 y	10 ± 5 × 10^9/l	1000 ± 500/mm^3
Children, 8-12 y	9 ± 4.5 × 10^9/l	9000 ± 4500/mm^3
	Range	**Range**
Differential leucocyte count		
Adults:		
Neutrophils	2.0-7.5 × 10^9/l (40-75%)	2000-7500/mm^3
Lymphocytes	1.5-4.0 × 10^9/l (20-45%)	1500-4000/mm^3
Monocytes	0.2-0.8 × 10^9/l (2-10%)	200-800/mm^3
Eosinophils	0.04-0.4 × 10^9/l (1-6%)	40-400/mm^3
Basophils	<0.01-0.1 × 10^9/l (<1%)	10-100/mm^3
Infants (1st day):		
Neutrophils	5.0 ± 13.0 × 10^9/l	500-1300/mm^3
Lymphocytes	3.5 ± 8.5 × 10^9/l	3500-8500/mm^3
Monocytes	0.5 ± 1.5 × 10^9/l	500-1500/mm^3
Eosinophils	0.1 ± 2.5 × 10^9/l	100-250/mm^3
Basophils	<0.01 ± 0.1 × 10^9/l	10-100/mm^3
Infants (3 y):		
Neutrophils	1.5 ± 7.0 × 10^9/l	1500-700/mm^3
Lymphocytes	2.0 ± 5.0 × 10^9/l	2000-500/mm^3
Monocytes	0.3 ± 1.1 × 10^9/l	300-1100/mm^3
Eosinophils	0.2 ± 2.0 × 10^9/l	20-200/mm^3
Basophils	<0.01± 0.1 × 10^9/l	10-100/mm^3
Children (6 y):		
Neutrophils	2.0 ± 6.0 × 10^9/l	200-600/mm^3
Lymphocytes	5.5 ± 8.5 × 10^9/l	5500-8500/mm^3
Monocytes	0.7 ± 1.5 × 10^9/l	700-1500/mm^3
Eosinophils	0.3 ± 0.8 × 10^9/l	300-800/mm^3
Basophils	<0.01± 0.1 × 10^9/l	10-100/mm^3
Platelet count	150-400 × 10^9/l	1.5-4.0 lakh/mm^3
Bleeding time (Ivy's method)	2-7 min	
(Template method)	2.5-9.5 min	

Coagulation time (Lee and White's method, 37°C)	5-11 min
Prothrombin time (brain-thromboplastin time)	
I-stage (Quick)	10-14 s
Partial thromboplastin time (PTTK)	35-43 s
Prothrombin-consumption index	0-30%
Plasma fibrinogen	2.0-4.0 g/l

Osmotic fragility (at 20°C and pH 7.4)

NaCl (g/l)	Before incubation % lysis	After incubation for 24 h at 37°C % lysis
2.0	100	95-100
3.0	97-100	85-100
3.5	90-99	75-100
4.0	50-95	65-100
4.5	5-45	55-95
5.0	0-6	40-85
5.5	0	15-70
6.0	0	0-40
6.5	0	0-10
7.0	0	0-5
7.5	0	0
8.0	0	0
8.5	0	0
Median corpuscular fragility (MCF) (g/l NaCl)	4.0-4.45	4.65-5.9

Autohaemolysis (37°C)	
48 h, without added glucose	0.2-4.0%
48 h, with added glucose	0-0.5%
Cold-agglutinin titre (4°C)	<64
Serum iron	13-32 µmol/l (0.7-1.8 mg/l)
Total iron-binding capacity	45-70 µmol/1 (2.5-4.0 mg/l)
Transferrin	1.2-2.0 g/l
Serum vitamin B_{12} (as cyanocobalamin)	160-925 ng/l
Serum folate	3-20 mcg/l
Red-cell folate	160-640 mcg/l
Plasma haemoglobin	10-40 mg/l
Serum haptoglobin (Hb-binding)	0.3-2.0 g/l
Sedimentation rate (Westergren, 1 h) (at 20±3°C)	
Men 17-50 y	1-7 mm
> 50 y	2-10 mm
Women 17-50 y	3-9 mm
> 50 y	5-15 mm
Plasma viscosity (at 25°C)	1.61 ± 0.05 cP
Heterophile (anti-sheep red-cell) agglutinin titre	<80
After absorption with guinea-pig kidney	<10