

TABLE OF CRITICAL LIMITS

Adults ¹						Children ²					
CLINICAL CHEMISTRY		LOW LIMIT		HIGH LIMIT		CLINICAL CHEMISTRY		LOW LIMIT		HIGH LIMIT	
Test	Units	Mean (SD)	Range	Mean (SD)	Range	Test	Units	Mean (SD)	Range	Mean (SD)	Range
Glucose	mmol/L mg/dL	2.6 (0.4) 46 (7)	1.7-3.9 30-70	26.9 (8.0) 484 (144)	6.1-55.5 110-1000	Glucose	mmol/L	2.6 (0.5)	1.7-3.3	24.7 (8.9)	13.9-55.5
Potassium	mmol/L	2.8 (0.3)	2.5-3.6	6.2 (0.4) 8.0 (hemolyzed)	5.0-8.0	Potassium	mmol/L	2.8 (0.3)	2.0-3.5	6.4 (0.5)	5.0-8.0
Calcium	mmol/L mg/dL	1.65 (0.17) 6.6 (0.7)	1.25-2.15 5.0-8.6	3.22 (0.22) 12.9 (0.9)	2.62-3.49 10.5-14.0	Calcium	mmol/L	1.62 (0.17)	1.25-1.87	3.17 (0.22)	2.74-3.74
Sodium	mmol/L	120 (5)	110-137	158 (6)	145-170	Sodium	mmol/L	121 (5)	110-130	156 (5)	150-170
CO ₂ content	mmol/L	11 (2)	5-20	40 (3)	35-50	CO ₂ content	mmol/L	11 (2)	6-18	39 (3)	33-45
Magnesium	mmol/L mg/dL	0.41 (0.16) 1.0 (0.4)	0.21-0.74 0.5-1.8	2.02 (0.82) 4.9 (2.0)	1.03-5.02 2.5-12.2	Magnesium	mmol/L	0.45 (0.04)	0.41-0.49	1.77 (0.45)	1.23-3.00
Phosphorus	mmol/L mg/dL	0.39 (0.10) 1.2 (0.3)	0.26-0.65 0.8-2.0	2.87 (0.48) 8.9 (1.5)	2.26-3.23 7.0-10.0	Phosphorus	mmol/L	0.42 (0.16)	0.16-0.65	2.87 (0.39)	2.26-3.23
Bilirubin	μmol/L mg/dL	— —	— —	257 (86) 15 (5)	86-513 5-30	Bilirubin	μmol/L	—	—	257 (68)	86-342
Chloride	mmol/L	75 (8)	60-90	126 (12)	115-156	Chloride	mmol/L	77 (8)	70-90	121 (5)	115-130
Osmolality	mmol/kg	250 (13)	230-280	326 (18)	295-375	Osmolality	mmol/kg	253 (12)	240-270	318 (10)	300-330
Urea nitrogen	mmol/L mg/dL	— —	— —	37.1 (21.1) 104 (59)	14.3-107.1 40-300	Urea nitrogen	mmol/L	—	—	19.6 (11.4)	3.9-53.6
Uric acid	μmol/L mg/dL	— —	— —	773 (119) 13 (2)	595-892 10-15	Uric acid	μmol/L	—	—	714 (119)	595-892
CSF glucose	mmol/L mg/dL	2.1 (0.6) 37 (10)	1.1-2.8 20-50	24.3 (11.4) 438 (206)	13.9-38.9 250-700	CSF glucose	mmol/L	1.7 (0.7)	1.1-2.8	—	—
Creatinine	μmol/L mg/dL	— —	— —	654 (380) 7.4 (4.3)	177-1326 2.0-15.0	Creatinine	μmol/L	—	—	336 (212)	221-884
Ionized calcium ⁴	mmol/L mg/dL	0.82 (0.14) 3.29 (0.56)	0.50-1.07 2.00-4.29	1.55 (0.19) 6.21 (0.76)	1.30-2.00 5.21-8.02	Ionized calcium ⁴	mmol/L	0.85 (0.13)	0.60-1.08	1.53 (0.11)	1.35-1.75
Lactate	mmol/L mg/dL	— —	— —	3.4 (1.3) 30.6 (11.7)	2.3-5.0 20.7-45.0	Lactate	mmol/L	—	—	4.1 (1.2)	2.4-5.5
						Albumin	g/L	17 (5)	10-25	68 (10)	60-80
						Ammonia	μmol/L	—	—	109 (50)	35-200
						Protein	g/L	34 (5)	30-40	95 (6)	90-100
						CSF protein	mg/L	—	—	1875 (854)	1000-3000
HEMATOLOGY						HEMATOLOGY					
Hematocrit	L/L	0.18 (0.05)	0.12-0.30	0.61 (0.06)	0.54-0.80	Hematocrit	L/L	0.20 (0.06)	0.10-0.30	0.62 (0.05)	0.54-0.70
Hemoglobin	g/L	66 (17)	40-120	199 (27)	170-300	Hemoglobin	g/L	69 (13)	50-100	208 (29)	170-250
Platelets	×10 ⁹ /L	37 (18)	10-100	910 (147)	555-1000	Platelets	×10 ⁹ /L	53 (25)	20-100	916 (220)	600-1500
WBC count	×10 ⁹ /L	2.0 (0.7)	1.0-4.0	37.0 (20.7)	10.0-100.0	WBC count	×10 ⁹ /L	2.1 (0.9)	0.5-3.5	42.9 (25.1)	15.0-100.0
PT	s	—	—	27 (9)	14-40	PT	s	—	—	21 (6)	15-35
PTT	s	—	—	68 (33)	32-150	PTT	s	—	—	62 (21)	40-100
Fibrinogen	g/L	0.88 (0.17)	0.50-1.00	7.75 (2.63)	5.00-10.00	Fibrinogen	g/L	0.77 (0.30)	0.20-12.0	—	—
						Bleeding time	min	—	—	14.0 (4.0)	9.5-20.0
BLOOD GASES AND pH						BLOOD GASES AND pH					
pCO ₂	mm Hg	19 (3)	9-25	67 (6)	50-80	pCO ₂	mm Hg	21 (6)	15-40	66 (23)	50-150
pH		7.21 (0.06)	7.00-7.35	7.59 (0.03)	7.50-7.65	pH	—	7.21 (0.05)	7.10-7.30	7.59 (0.04)	7.50-7.70
pO ₂	mm Hg kPa	43 (6) 5.7 (0.8)	30-55 4.0-7.3	— —	— —	pO ₂	mm Hg	45 (7)	30-55	124 (25)	100-150
NEWBORN ²						NEWBORN ²					
		LOW LIMIT				HIGH LIMIT					
Test	Facility	Units	Mean (SD)	Range	Mean (SD)	Range					
Glucose	CH	mmol/L	1.8 (0.4)	1.1-2.8	18.2 (3.6)	16.7-27.8					
Potassium	CH	mmol/L	2.8 (0.4)	2.5-3.7	7.8 (0.5)	6.5-8.0					
Modified potassium	CH	mmol/L	2.8 (0.4)	2.5-3.7	6.5	(See Ref. 3)					
Bilirubin	CH	μmol/L	—	—	222 (86)	86-308					
Hemoglobin	USMC	g/L	95 (35)	50-150	223 (23)	210-250					
Hematocrit	USMC	L/L	0.33 (0.08)	0.24-0.45	0.71 (0.04)	0.65-0.75					
pO ₂	USMC	mm Hg	37 (7)	30-50	92 (12)	70-100					

1. Adult table modified with permission by JAMA, Vol. 263, pp. 704-707, 1990. CSF, cerebrospinal fluid; WBC, white blood cell; PT, prothrombin time; PTT, partial thromboplastin time. Qualitative critical results for adults¹ include the following: For *blood bank and immunology*—incompatible crossmatch, tests positive for syphilis (RPR or VDRL). For *microbiology and parasitology*—Positive results from Gram stain or in culture from blood, cerebrospinal fluid, or body cavity fluid; positive India ink preparation; positive rapid antigen detection by agglutination tests for *Cryptococcus*, group B streptococci, *Haemophilus influenzae b*, or *Neisseria meningitidis*, positive results from acid-fast bacillus stain or culture; *Salmonella*, *Shigella*, or *Campylobacter* on stool culture; presence of malarial parasites. For *clinical microscopy and urinalysis*—elevated white blood cell count in CSF; presence of malignant cells, blasts, or microorganisms in CSF or body fluids; combination of strongly positive test results for glucose and for ketones in urine; presence of pathologic crystals (urate, cysteine, leucine, or tyrosine) on urinalysis. For *hematology*—Listed frequently are the presence of blasts on blood smear; new diagnosis or findings of leukemia; presence of sickle cells (or aplastic crisis). Listed occasionally are plasma cells, band cells, atypical lymphocytes, and abnormal reticulocyte count.

2. Children and newborn tables modified with permission by Pediatrics, Vol. 88, pp. 597-603, 1991. CSF, cerebrospinal fluid; WBC, white blood cell; PT, prothrombin time; PTT, partial thromboplastin time; CH, Children's Hospital; USMC, U.S. Medical Centers. Qualitative critical results for children² include the following: For *hematology*—presence of blasts in the blood smear; new diagnosis or findings of leukemia; presence of drepanocytes (sickle cells); atypical lymphocytes, or abnormal reticulocyte count; abnormal erythrocyte indices (mean corpuscular volume, mean corpuscular hemoglobin, mean corpuscular hemoglobin concentration). For *clinical microscopy and urinalysis*—elevated white blood cells in CSF; presence of malignant cells, blasts, or microorganisms in CSF or body fluids; combination of strongly positive test results for glucose and for ketones in urine. For *microbiology and parasitology*—positive results from Gram stain or culture from blood, CSF, or body cavity fluid; presence of malarial parasites.