

INFECTIOUS DISEASES INSTITUTE CORE LABORATORY
Pediatrics Reference Ranges – Hematology, Flow Cytometry, & Chemistry

Instrument-Coulter Act-5 Test	Age	Reference Range	Source
WBC, 10 ³ cells/uL	0 - 3 days	7.0 – 25.7	Ugandan
	4 – 60 days	3.6 – 15.4	Ugandan
	61 – 365 days	2.5 – 17.8	Ugandan
	366 – 730 days	3.6 – 16.4	Ugandan
	2 – 6 years	5.0 – 15.5	JHU-Harriet Lane Ref. 20 th Ed
	6 – 12 years	4.5 – 13.5	JHU-Harriet Lane Ref. 20 th Ed
	12 – 18 years	4.5 – 13.5	JHU-Harriet Lane Ref. 20 th Ed
RBC, 10 ⁶ cells/uL	0 - 3 days	3.3 – 5.0	Ped. Reference Range-2 nd Ed (Coulter)
	4 – 14 days	3.5 – 5.3	Ped. Reference Range-2 nd Ed (Coulter)
	15 – 30 days	3.3 – 4.9	Ped. Reference Range-2 nd Ed (Coulter)
	31 – 60 days	3.1 – 4.1	Ped. Reference Range-2 nd Ed (Coulter)
	61 – 730 days	3.4 – 5.2	Ped. Reference Range-2 nd Ed (Coulter)
	2 – 12 years	3.3 – 4.9	Ped. Reference Range-2 nd Ed (Coulter)
	13 – 18 years	3.3 – 5.4	Ped. Reference Range-2 nd Ed (Coulter)
HGB, g/dL	0 – 3 days	12.6 – 20.9	Ugandan
	4 – 7 days	11.3 – 19.8	Ugandan
	8 – 60 days	8.1 – 13.2	Ugandan
	61 – 730 days	7.2 – 12.7	Ugandan
	2 – 6 years	11.5 – 12.5	JHU-Harriet Lane Ref.- 20 th Ed
	6 – 12 years	11.5 – 13.5	JHU-Harriet Lane Ref.- 20 th Ed
	12 – 18 years Male Female	13-14.5 12-14	JHU-Harriet Lane Ref.- 20 th Ed
HCT, %	1– 3 days	45 – 56	JHU-Harriet Lane Ref. -20 th Ed
	4 – 14 days	41 – 53	JHU-Harriet Lane Ref.- 20 th Ed
	15 – 30 days	33 – 44	JHU-Harriet Lane Ref.- 20 th Ed
	31 – 60 days	28 – 35	JHU-Harriet Lane Ref. -20 th Ed d
	61 – 180 days	31 – 36	JHU-Harriet Lane Ref.- 20 th Ed
	181 – 730 days	33 – 36	JHU-Harriet Lane Ref.- 20 th Ed
	2 - 6 years	34 – 37	JHU-Harriet Lane Ref. -20 th Ed
	6 – 12 years	35 – 40	JHU-Harriet Lane Ref.- 20 th Ed
12 – 18 years	36 - 43	JHU-Harriet Lane Ref.- 20 th Ed	
MCV, fL	0 – 3 days	95 – 108	JHU-Harriet Lane Ref. -20 th Ed
	4 – 14 days	88 – 105	JHU-Harriet Lane Ref.-20 th Ed
	15 – 30 days	91 – 101	JHU-Harriet Lane Ref.- 20 th Ed
	31 – 60 days	84 – 95	JHU-Harriet Lane Ref. -20 th Ed
	61 – 180 days	68 – 76	JHU-Harriet Lane Ref.- 20 th Ed
	181 – 730 days	70 – 78	JHU-Harriet Lane Ref.- 20 th Ed
	2 - 6 years	75 – 81	JHU-Harriet Lane Ref. -20 th Ed
	7 – 12 years	77 – 86	JHU-Harriet Lane Ref.- 20 th Ed
13 – 18 years	78 - 90	JHU-Harriet Lane Ref.- 20 th Ed	
MCH, pg	0 - 3 days	31.3 - 38.6	Ped. Reference Range-2 nd Ed (Coulter)
	4 – 14 days	29.1 – 36.2	Ped. Reference Range-2 nd Ed (Coulter)
	15 – 30 days	28.8 – 33.6	Ped. Reference Range-2 nd Ed (Coulter)
	31 – 60 days	28.0 – 30.5	Ped. Reference Range-2 nd Ed (Coulter)
	61 – 730 days	24.2 – 30.0	Ped. Reference Range-2 nd Ed (Coulter)
	2 – 12 years	24.6 – 30.9	Ped. Reference Range-2 nd Ed (Coulter)
	13 – 18 years	25.9 – 31.0	Ped. Reference Range-2 nd Ed (Coulter)
	0 – 3 days	29 – 33.0	JHU-Harriet Lane Ref. -20 th Ed
4 – 14 days	28.1 – 31.4	JHU-Harriet Lane Ref.- 20 th Ed	

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	15 – 30 days	28.1 – 31.8	JHU-Harriet Lane Ref.- 20 th Ed
	31 – 60 days	28.3 – 31.8	JHU-Harriet Lane Ref. -20 th Ed
	61 – 180 days	32.7 – 35.0	JHU-Harriet Lane Ref.- 20 th Ed
	181 – 730 days	30.0 – 33.0	JHU-Harriet Lane Ref.- 20 th Ed
	2 - 6 years	31.0 – 34.0	JHU-Harriet Lane Ref. -20 th Ed
	7 – 12 years	31.0 – 34.0	JHU-Harriet Lane Ref.- 20 th Ed
	13 – 18 years	31.0 – 34.0	JHU-Harriet Lane Ref.- 20 th Ed
RDW, %	0 - 3 days	14.9 – 18.5	Ped. Reference Range-2 nd Ed (Coulter)
	4 – 14 days	14.6 – 19.2	Ped. Reference Range-2 nd Ed (Coulter)
	15 – 30 days	14.2 – 18.5	Ped. Reference Range-2 nd Ed (Coulter)
	31 – 60 days	12.9 – 17.0	Ped. Reference Range-2 nd Ed (Coulter)
	61 – 730 days	12.1 – 16.2	Ped. Reference Range-2 nd Ed (Coulter)
	2 – 12 years	11.8 – 14.9	Ped. Reference Range-2 nd Ed (Coulter)
	13 – 18 years	12.1 – 18.4	Ped. Reference Range-2 nd Ed (Coulter)
PLT, 10 ³ cells/uL	0 – 3 days	130 - 345	Ugandan
	4 – 7 days	135 - 460	Ugandan
	8 – 90 days	150 - 600	Ugandan
	91 – 730 days	140 - 635	Ugandan
	2 – 6 years	150 - 350	JHU-Harriet Lane Ref.- 20 th Ed
	7 – 18 years	150 - 350	JHU-Harriet Lane Ref.- 20 th Ed
MPV, fL	0 - 3 days	7.1 – 8.4	Ped. Reference Range-2 nd Ed (Coulter)
	4 – 14 days	7.5 – 10.0	Ped. Reference Range-2 nd Ed (Coulter)
	15 – 30 days	8.0 – 10.6	Ped. Reference Range-2 nd Ed (Coulter)
	31 – 60 days	7.0 – 11.3	Ped. Reference Range-2 nd Ed (Coulter)
	61 – 730 days	6.8 – 9.3	Ped. Reference Range-2 nd Ed (Coulter)
	2 – 12 years	7.1 – 9.4	Ped. Reference Range-2 nd Ed (Coulter)
	13 – 18 years	7.3 – 9.7	Ped. Reference Range-2 nd Ed (Coulter)
NEUT %	0 - 3 days	33.9 – 69.6	Ped. Reference Range-2 nd Ed (Coulter)
	4 – 14 days	15.8 – 61.1	Ped. Reference Range-2 nd Ed (Coulter)
	15 – 30 days	17.3 – 61.0	Ped. Reference Range-2 nd Ed (Coulter)
	31 – 60 days	16.0 – 58.9	Ped. Reference Range-2 nd Ed (Coulter)
	61 – 730 days	20.7 – 61.8	Ped. Reference Range-2 nd Ed (Coulter)
	2 – 12 years	32.3 – 76.9	Ped. Reference Range-2 nd Ed (Coulter)
	13 – 18 years	41.9 – 77.8	Ped. Reference Range-2 nd Ed (Coulter)
LYMP%	0 - 3 days	12 - 42	Ugandan
	4 – 60 days	24 – 61	Ugandan
	61 – 365 days	32 - 80	Ugandan
	366 – 730 days	28 - 70	Ugandan
	2 – 6 years	14.3 – 50.6	Ped. Reference Range-2 nd Ed (Coulter)
	7 – 12 years	13.1 – 45.2	Ped. Reference Range-2 nd Ed (Coulter)
	13 – 18 years	12.9 – 40.6	Ped. Reference Range-2 nd Ed (Coulter)
MONOS%	0 - 3 days	1.4 – 16.3	Ped. Reference Range-2 nd Ed (Coulter)
	4 – 14 days	1.3 – 22.2	Ped. Reference Range-2 nd Ed (Coulter)
	15 – 30 days	2.7 – 22.9	Ped. Reference Range-2 nd Ed (Coulter)
	31 – 60 days	2.4 – 19.1	Ped. Reference Range-2 nd Ed (Coulter)
	61 – 730 days	3.3 – 18.1	Ped. Reference Range-2 nd Ed (Coulter)
	2 – 12 years	4.2 – 13.3	Ped. Reference Range-2 nd Ed (Coulter)
	13 – 18 years	3.8 – 11.2	Ped. Reference Range-2 nd Ed (Coulter)
EOS %	0 - 3 days	0 – 2.9	Ped. Reference Range-2 nd Ed (Coulter)

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	4 – 14 days	0 – 7.5	Ped. Reference Range-2 nd Ed (Coulter)
	15 – 30 days	0 – 5.4	Ped. Reference Range-2 nd Ed (Coulter)
	31 – 60 days	0 – 3.1	Ped. Reference Range-2 nd Ed (Coulter)
	61 – 730 days	0 – 3.1	Ped. Reference Range-2 nd Ed (Coulter)
	2 – 12 years	0 – 4.0	Ped. Reference Range-2 nd Ed (Coulter)
	13 – 18 years	0 – 4.1	Ped. Reference Range-2 nd Ed (Coulter)
BASO%	0 - 3 days	0 – 2.1	Ped. Reference Range-2 nd Ed (Coulter)
	4 – 14 days	0 – 2.7	Ped. Reference Range-2 nd Ed (Coulter)
	15 – 30 days	0 – 1.1	Ped. Reference Range-2 nd Ed (Coulter)
	31 – 60 days	0 – 0.9	Ped. Reference Range-2 nd Ed (Coulter)
	61 – 730 days	0 – 1.1	Ped. Reference Range-2 nd Ed (Coulter)
	2 – 12 years	0 – 1.1	Ped. Reference Range-2 nd Ed (Coulter)
	13 – 18 years	0 – 1.0	Ped. Reference Range-2 nd Ed (Coulter)
NEUT, 10 ³ cells/uL	0 – 1 day	5.0 – 21.0	JHU-Harriet Lane Ref. -20 th Ed
	2 – 7 days	1.5 – 10	JHU-Harriet Lane Ref.- 20 th Ed
	7 – 14 days	1.0 – 9.5	JHU-Harriet Lane Ref.- 20 th Ed
	14 – 30 days	1.0 – 8.5	JHU-Harriet Lane Ref. -20 th Ed
	31 – 180 days	1.0 – 8.5	JHU-Harriet Lane Ref. -20 th Ed
	181 – 730 days	1.5 – 8.5	JHU-Harriet Lane Ref.- 20 th Ed
	2 – 6 years	1.5 – 8.5	JHU-Harriet Lane Ref.- 20 th Ed
	7 – 10 years	1.5 – 8.5	JHU-Harriet Lane Ref. -20 th Ed
11 – 16 Years	1.8 – 8.0	JHU-Harriet Lane Ref. -20 th Ed	
LYPHABS, 10 ³ cells/uL	0 - 3 days	1.7 – 6.5	Ugandan
	4 – 60 days	1.3 – 9.3	Ugandan
	61 – 365 days	1.0 – 10.6	Ugandan
	366 – 730 days	1.1 – 8.6	Ugandan
	2 – 6 years	1.5 – 7.0	JHU-Harriet Lane Ref.- 20 th Ed
	6 – 12 years	1.5 – 6.8	JHU-Harriet Lane Ref. -20 th Ed
	12 – 16 years	1.2 – 5.2	JHU-Harriet Lane Ref. -20 th Ed
MONOABS, 10 ³ cells/uL	0 - 3 days	0.2 – 2.2	Ped. Reference Range-2 nd Ed (Coulter)
	4 – 14 days	0.1 – 2.9	Ped. Reference Range-2 nd Ed (Coulter)
	15 – 30 days	0.2 – 5.0	Ped. Reference Range-2 nd Ed (Coulter)
	31 – 60 days	0.2 – 2.1	Ped. Reference Range-2 nd Ed (Coulter)
	61 – 730 days	0.3 – 1.9	Ped. Reference Range-2 nd Ed (Coulter)
	2 – 12 years	0.4 – 1.1	Ped. Reference Range-2 nd Ed (Coulter)
	13 – 18 years	0.4 – 0.9	Ped. Reference Range-2 nd Ed (Coulter)
EOSNOPH, 10 ³ cells/uL	0 - 3 days	0 – 0.2	Ped. Reference Range-2 nd Ed (Coulter)
	4 – 14 days	0 – 0.6	Ped. Reference Range-2 nd Ed (Coulter)
	15 – 30 days	0 – 0.5	Ped. Reference Range-2 nd Ed (Coulter)
	31 – 60 days	0 – 0.2	Ped. Reference Range-2 nd Ed (Coulter)
	61 – 730 days	0 – 0.2	Ped. Reference Range-2 nd Ed (Coulter)
	2 – 12 years	0 – 0.2	Ped. Reference Range-2 nd Ed (Coulter)
	13 – 18 years	0 – 0.2	Ped. Reference Range-2 nd Ed (Coulter)
BASOPH, 10 ³ cells/uL	0 - 3 days	0 – 0.5	Calculated Value/ based on RR's Above
	4 – 60 days	0 – 0.4	Calculated Value/ based on RR's Above
	61 – 730 days	0 – 0.2	Calculated Value/ based on RR's Above
	2 – 12 years	0 – 0.2	Calculated Value/ based on RR's Above
	13 – 18 years	0 – 0.1	Calculated Value/ based on RR's Above

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Core Lab Reference Ranges – Flow-Cyto – Child

BD Facs-Calibur Test	Age	Reference Range	Source
CD4/CD8,			
CD4%-	0 – 30 days	18 – 77	Ugandan
	31 – 365 days	15 - 65	Ugandan
	366 – 730 days	18 – 60	Ugandan
	2 – 6 years	28-47	JHU-Harriet Lane Ref.-20th Ed
	6 – 12 years	31-47	JHU-Harriet Lane Ref. -20th Ed
	12-18 years	31-52	JHU-Harriet Lane Ref. -20th Ed
CD4ABS-, 10 ⁹ cells/L	0 – 30 days	0.4 – 3.6	Ugandan
	31 – 365 days	0.5 – 3.8	Ugandan
	366 – 730 days	0.4 – 3.4	Ugandan
	2 – 6 years	0.7 – 2.2	JHU-Harriet Lane Ref.-20 th Ed
	6 – 12 years	0.65 – 1.5	JHU-Harriet Lane Ref. -20 th Ed
	12 – 18 years	0.53 – 1.3	JHU-Harriet Lane Ref. -20 th Ed
CD8%-	0 – 3 mo	12 - 28	JHU-Harriet Lane Ref.-20 th Ed
	3-6mo	12 – 23	JHU-Harriet Lane Ref. -20 th Ed
	6-12mo	12 – 24	JHU-Harriet Lane Ref. -20 th Ed
	1-2yr	14 – 30	JHU-Harriet Lane Ref.-20 th Ed
	2 – 6 years	16 – 30	JHU-Harriet Lane Ref. -20 th Ed
	6 – 12 years	18 – 35	JHU-Harriet Lane Ref.-20 th Ed
	12 – 18 years	18 - 35	JHU-Harriet Lane Ref. -20 th Ed
CD8ABS-, 10 ⁹ cells/L	0 – 3 mo	0.56-1.70	JHU-Harriet Lane Ref.-20 th Ed
	3-6mo	0.59-1.60	JHU-Harriet Lane Ref. -20 th Ed
	6-12mo	0.50-1.70	JHU-Harriet Lane Ref. -20 th Ed
	1-2yr	0.62-2.00	JHU-Harriet Lane Ref.-20 th Ed
	2 – 6 years	0.49-1.30	JHU-Harriet Lane Ref. -20 th Ed
	6 – 12 years	0.37-1.10	JHU-Harriet Lane Ref.-20 th Ed
	12 – 18 years	0.33-0.92	JHU-Harriet Lane Ref. -20 th Ed
CD4CD8RT, ratio	0 – 30 days	0.71-2.12	Calculated
	31 – 365 days	0.85-2.24	Calculated
	366 – 730 days	0.65-1.70	Calculated
	2 – 6 years	1.43-1.69	Calculated
	6 – 12 years	1.76-1.36	Calculated
	12 – 18 years	1.61-1.41	Calculated

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Core Lab Reference Ranges- Chemistry – Child

Roche-Integra 400+ Chemistry	Age	Reference Range	Source
Albumin, g/L	1- 4 days	28 – 44 g/L	Roche.Ref.Manual
	5 days – 14 yr	38 – 55 g/L	Roche.Ref.Manual
	15 – 18yr	32 – 45 g/L	Roche.Ref.Manual
Alk. Phosphatase, IU/L	0 - 1 day	0- 250 U/L	Roche.Ref.Manual
	2 – 5 days	0 – 231 U/L	Roche.Ref.Manual
	6 – 180 Day	0 – 449 U/L	Roche.Ref.Manual
	7 – 12 months	0 – 462 U/L	Roche.Ref.Manual
	1 – 3 yr	0 - 281 U/L	Roche.Ref.Manual
	4 – 6 yr	0 – 269 U/L	Roche.Ref.Manual
	7 – 12 yr	0 – 300 U/L	Roche.Ref.Manual
	13 – 17 yr (Male)	0 – 390 U/L	Roche.Ref.Manual
13 – 17 yr (Female)	0 – 187 U/L	Roche.Ref.Manual	
ALT (SGPT), U/L	0 - 6 day	0 -57 U/L	Ugandan
	7 – 30 days	0 – 45 U/L	Ugandan
	31 – 60 days	5 – 55 U/L	Ugandan
	61 – 180 days	0 – 60 U/L	Roche.Ref.Manual
	7 – 12 months	0 – 57 U/L	Roche.Ref.Manual
	1 – 3 yr	0 – 39 U/L	Roche.Ref.Manual
	4 – 6 yr	0 – 39 U/L	Roche.Ref.Manual
	7 – 12 yr	0 – 39 U/L	Roche.Ref.Manual
	13 – 17 yr (Male)	0 – 26 U/L	Roche.Ref.Manual
	13 – 17 yr (Female)	0 – 23 U/L	Roche.Ref.Manual
AST (SGOT), U/L	0 - 1 day	0 – 122 U/L	Roche.Ref.Manual
	2 – 5 days	0 – 110 U/L	Roche.Ref.Manual
	6 days – 180 days	0 – 84 U/L	Roche.Ref.Manual
	7 – 12 months	0 – 89 U/L	Roche.Ref.Manual
	1 – 3 yr	0 – 56 U/L	Roche.Ref.Manual
	4 – 6 yr	0 – 52 U/L	Roche.Ref.Manual
	7 – 12 yr	0 – 51 U/L	Roche.Ref.Manual
	13 – 17 yr (Male)	0 – 35 U/L	Roche.Ref.Manual
13 – 17 yr (Female)	0 – 27 U/L	Roche.Ref.Manual	
AMYLASE (AMY)	0 - 1 yr	0 – 8 U/L	Roche.Ref.Manual
	1 – 9 yr	0 - 31 U/L	Roche.Ref.Manual
	10 – 18 yr	0 - 39 U/L	Roche.Ref.Manual
CALCIUM (CA)	0 - 10 days	1.9 – 2.5 mmol/L	Roche.Ref.Manual
	10 - 365 days	2.1 – 2.7 mmol/L	Roche.Ref.Manual
	366 - 1460 days	2.1 – 2.6 mmol/L	Roche.Ref.Manual
	1461 - 7300 days	2.30 – 2.75 mmol/L	Roche.Ref.Manual
CHOLESTEROL (CHOL)	0 – 28 days	50 – 170 mg/dL	Roche.Ref.Manual
	29 – 365 days	60 – 190 mg/dL	Roche.Ref.Manual
	366 – 5840 days	110 – 230 mg/dL	Roche.Ref.Manual
Creatine Kinase (CK)	1 day	0 – 712 U/L	Roche.Ref.Manual
	2 – 5 days	0 – 652 U/L	Roche.Ref.Manual
	6 – 180 days	0 – 295 U/L	Roche.Ref.Manual
	7 – 12 months	0 – 203 U/L	Roche.Ref.Manual
	1 – 3 yr	0 – 228 U/L	Roche.Ref.Manual

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	4 – 6 yr	0 – 149 U/L	Roche.Ref.Manual
	7 – 12 yr (Male)	0 – 247 U/L	Roche.Ref.Manual
Roche-Integra 400+ Chemistry	Age	Reference Range	Source
Creatine Kinase (CK)	7 – 12 yr (Female)	0 – 154 U/L	Roche.Ref.Manual
	13 – 17 yr (Male)	0 – 270 U/L	Roche.Ref.Manual
	13 – 17 yr (Female)	0 – 123 U/L	Roche.Ref.Manual
Bicarbonate	0days - 18yr	20 – 29	Roche Ref Manual
Phosphate	0 – 60 days	5.0 – 9.6 mg/dL	Roche Method Manual
	61 – 365 days	5.0 – 10.9 mg/dL	Roche Method Manual
	1 – 11 years	3.4-6.2 mg/dL	Roche Method Manual
Creatinine, mg/dL	0 -1 days	0 - 0.98 mg/dL	Roche.Ref.Manual
	2 – 14 days	0 - 0.88 mg/dL	Roche.Ref.Manual
	15 – 59 Days	0 – 0.70 mg/dL	MU-JHU PI's Medical Committee
	2 – 12 months	0 - 0.39 mg/dL	Roche.Ref.Manual
	1 – 3 yr	0 - 0.35 mg/dL	Roche.Ref.Manual
	4 -5 yr	0 - 0.42 mg/dL	Roche.Ref.Manual
	6 – 7 yr	0 - 0.47 mg/dL	Roche.Ref.Manual
	8 – 9 yr	0 - 0.53 mg/dL	Roche.Ref.Manual
	10 – 11 yr	0 - 0.64 mg/dL	Roche.Ref.Manual
	12 – 13 yr	0 - 0.68 mg/dL	Roche.Ref.Manual
	14 – 15 yr	0 - 0.77 mg/dL	Roche.Ref.Manual
Glucose, mg/dL	1- 5 days	50 – 80 mg/dL	Roche.Ref.Manual
	6 – 365 days	42 – 96 mg/dL	MU-JHU PI's Medical Committee
	1 – 15 yr	60 – 100 mg/dL	Roche.Ref.Manual
	16– 18 yr	70 – 105 mg/dL	Harriet Lane Hand Book 20 th Ed.
GGT, U/L	0- 1 day	0 – 151 U/L	Roche.Ref.Manual
	2 – 5 days	0 – 185 U/L	Roche.Ref.Manual
	6 – 180 days	0 – 204 U/L	Roche.Ref.Manual
	7 – 12 months	0 – 34 U/L	Roche.Ref.Manual
	1 – 3 yr	0 – 18 U/L	Roche.Ref.Manual
	4 – 6 yr	0 – 23 U/L	Roche.Ref.Manual
	7 – 12 yr	0 – 17 U/L	Roche.Ref.Manual
	13 – 17 yr (Male)	0 – 45 U/L	Roche.Ref.Manual
	13 – 17 yr (Female)	0 – 33 U/L	Roche.Ref.Manual
Urea nitrogen, mg/dL (BUN)	0 - 6 months	0 – 42 mg/dL	Roche.Ref.Manual
	0.5 – 18 years	0 – 48 mg/dL	Roche.Ref.Manual
Total Bilirubin	0 - 3 day	0 - 6.0 mg/dL	Ugandan
	4 - 7 day	0 – 12.9 mg/dL	Ugandan
	8 – 60 day	0 – 2.1 mg/dL	Ugandan
	61d – 18 years	0 - 1.5 mg/dL	Harriet Lane Hand Book 20 th Ed.
Uric Acid (UA)	0 – 1 days	0 - 5.5 mg/dL	Roche.Ref.Manual
	2 – 28 days	0 - 5.2 mg/dL	Roche.Ref.Manual
	1 – 12 month	0 - 6.2 mg/dL	Roche.Ref.Manual
	1 – 18 years	0 - 6.1 mg/dL	Roche.Ref.Manual
Lipase	0–30 days	6–55 U/L	JHU-Harriet Lane Ref. -20 th Ed
	1–6 months	4–29 U/L	JHU-Harriet Lane Ref. -20 th Ed

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	6–12 months	4–23 U/L	JHU-Harriet Lane Ref. -20 th Ed
	>1 year	3–32 U/L	JHU-Harriet Lane Ref. -20 th Ed
Roche-Integra 400+ Chemistry	Age	Reference Range	Source
Direct Bilirubin	Neonate	<0.6 mg/dL	JHU-Harriet Lane Ref. -20 th Ed
	Infants/children	<0.2 mg/dL	JHU-Harriet Lane Ref. -20 th Ed
Total protein	Premature infants ,1 d	34-50g/L	Roche.Ref.Manual
	1d-4wk	46-68g/L	Roche.Ref.Manual
	2-12mth	48-76g/L	Roche.Ref.Manual
	≥1 year	60-80g/L	Roche.Ref.Manual
Electrolytes			
Chloride (CL)	0 – 1 days	97 – 122 mmol/L	Roche.Ref.Manual
	2 – 28 day	95 – 116 mmol/L	Roche.Ref.Manual
	1 – 12 month	93 – 112 mmol/L	Roche.Ref.Manual
	1 – 18 years	96 – 111 mmol/L	Roche.Ref.Manual
Potassium (K)	0 – 1 days	3.2 – 4.6 mmol/L	Roche.Ref.Manual
	2 – 28 day	3.6 – 6.1 mmol/L	Roche.Ref.Manual
	1 – 12 month	3.6 – 5.8 mmol/L	Roche.Ref.Manual
	1 – 18 years	3.1 – 5.1 mmol/L	Roche.Ref.Manual
Sodium (NA)	0 – 1 days	128 – 147 mmol/L	Roche.Ref.Manual
	2 – 28 day	132 – 147 mmol/L	Roche.Ref.Manual
	1 – 12 month	129 – 143 mmol/L	Roche.Ref.Manual
	1 – 18 years	132 – 145 mmol/L	Roche.Ref.Manual