

VCU Health Pathology
Blood Gas Laboratory
Reference Interval and Critical Results Table

Blood Gas Testing Reference Ranges and Critical Values

Test	Unit	Venous Blood Gas Reference Range	Venous Blood Gas Critical Values	Arterial Blood Gas Reference Range	Arterial Blood Gas Critical Values	Capillary Blood Gas Reference Range	Capillary Blood Gas Critical Values	Mixed Venous Blood Gas Reference Range	Mixed Venous Blood Gas Critical Values
pH		N/A	<7.15 or > 7.59	7.35-7.45	< 7.3 or > 7.60	7.30-7.40	N/A	7.31-7.41	< 7.15 or > 7.59
PCO2	mmHg	N/A	< 19 or > 85	34-45	< 20 or > 60	35-40	N/A	39-49	< 19 or > 85
PO2	mmHg	N/A	N/A	80-110	< 55	35-45	N/A	35-40	N/A
SO2	%	N/A	N/A	95-100	N/A	N/A	N/A	70-80	N/A
Base Ex	mmol/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HCO3	mmol/L	22-28	N/A	22-28	N/A	22-28	N/A	22-28	N/A

Whole Blood Chemistry Reference Ranges and Critical Values

Test	Unit	Venous Blood Gas Reference Range	Venous Blood Gas Critical Values	Arterial Blood Gas Reference Range	Arterial Blood Gas Critical Values	Capillary Blood Gas Reference Range	Capillary Blood Gas Critical Values	Mixed Venous Blood Gas Reference Range	Mixed Venous Blood Gas Critical Values
Na	mmol/L	135-145	< 125 or > 155	135-145	< 125 or > 155	135-145	< 125 or > 155	135-145	< 125 or > 155
K	mmol/L	0-3 days: 5.0-7.5 3 days-3 months: 4.0-6.2 >3 months to adult: 3.6-5.1	0-3 days: < 2.8 or > 7.5 3 days-3 months: < 2.8 or > 6.2 >3 months to adult: < 2.8 or > 6.1	0-3 days: 5.0-7.5 3 days-3 months: 4.0-6.2 >3 months to adult: 3.6-5.1	0-3 days: < 2.8 or > 7.5 3 days-3 months: < 2.8 or > 6.2 >3 months to adult: < 2.8 or > 6.1	0-3 days: 5.0-7.5 3 days-3 months: 4.0-6.2 >3 months to adult: 3.6-5.1	0-3 days: < 2.8 or > 7.5 3 days-3 months: < 2.8 or > 6.2 >3 months to adult: < 2.8 or > 6.1	0-3 days: 5.0-7.5 3 days-3 months: 4.0-6.2 >3 months to adult: 3.6-5.1	0-3 days: < 2.8 or > 7.5 3 days-3 months: < 2.8 or > 6.2 >3 months to adult: < 2.8 or > 6.1
Cl	mmol/L	Newborn - 30days: 96-106 30days-adult: 100-110	N/A	Newborn - 30days: 96-106 30days-adult: 100-110	N/A	Newborn - 30days: 96-106 30days-adult: 100-110	N/A	Newborn - 30days: 96-106 30days-adult: 100-110	N/A
Ionized calcium	mmol/L	1.16-1.32	< 0.85 to > 1.50	1.16-1.32	< 0.85 to > 1.50	1.16-1.32	< 0.85 to > 1.50	1.16-1.32	< 0.85 to > 1.50
Ionized Magnesium	mmol/L	0.46-0.64	N/A	0.46-0.64	N/A	0.46-0.64	N/A	0.46-0.64	N/A
Glucose	mg/dL	< 30days: 40-90 30 days-3yrs: 60-100 >3yrs: 65-100	0-30days: <40 or > 200 >30days: <50 or >500	< 30days: 40-90 30 days-3yrs: 60-100 >3yrs: 65-100	0-30days: <40 or > 200 >30days: <50 or >500	< 30days: 40-90 30 days-3yrs: 60-100 >3yrs: 65-100	0-30days: <40 or > 200 >30days: <50 or >500	< 30days: 40-90 30 days-3yrs: 60-100 >3yrs: 65-100	0-30days: <40 or > 200 >30days: <50 or >500
Lactate	mmol/L	0.5-2.0	Critical High Only: > 3.0	0.5-2.0	Critical High Only: > 3.0	0.5-2.0	Critical High Only: > 3.0	0.5-2.0	Critical High Only: > 3.0
BUN	mg/dL	<3 yrs: 4-18 3yr - adult: 8-23	N/A	<3 yrs: 4-18 3yr - adult: 8-23	N/A	<3 yrs: 4-18 3yr - adult: 8-23	N/A	<3 yrs: 4-18 3yr - adult: 8-23	N/A
Creatinine	mg/dL	0-3yrs: 0.0-0.7 Male, >3yrs: 0.6-1.2 Female, >3yrs: 0.5-1.0	N/A	0-3yrs: 0.0-0.7 Male, >3yrs: 0.6-1.2 Female, >3yrs: 0.5-1.0	N/A	0-3yrs: 0.0-0.7 Male, >3yrs: 0.6-1.2 Female, >3yrs: 0.5-1.0	N/A	0-3yrs: 0.0-0.7 Male, >3yrs: 0.6-1.2 Female, >3yrs: 0.5-1.0	N/A

Whole Blood COOX Reference Ranges and Critical Values

Test	Unit	Venous Blood Gas Reference Range	Venous Blood Gas Critical Values	Arterial Blood Gas Reference Range	Arterial Blood Gas Critical Values	Capillary Blood Gas Reference Range	Capillary Blood Gas Critical Values	Mixed Venous Blood Gas Reference Range	Mixed Venous Blood Gas Critical Values	
tHb	g/dL	Male, 0-14day: 13.9-19.1 Female, 0-14day: 13.4-20.0 Male, 15-30day: 10.0-15.3 Female, 15-30day: 10.8-14.6 Male, 31-60day: 8.9-12.7 Female, 31-60day: 9.2-11.4 Male, 61-180day: 9.6-12.4 Female, 61-180day: 9.9-12.4 Male, 181d-<2year: 10.1-12.5 Female, 181d-<2year: 10.2-12.7 Male, 2-<6year: 10.2-12.7 Female, 2-<6year: 10.2-12.7 Male, 6-<12year: 10.7-13.4 Female, 6-<12year: 10.6-13.2 Male, 12-<18year: 11.0-14.5 Female, 12-<18year: 10.8-13.3 Male, 18-150year: 13.3-17.0 Female, 18-150year: 12.0-15.0	0-150 years, Critical Low: ≤ 7.0 >30d-150yrs, Critical High: ≥20.0	Male, 0-14day: 13.9-19.1 Female, 0-14day: 13.4-20.0 Male, 15-30day: 10.0-15.3 Female, 15-30day: 10.8-14.6 Male, 31-60day: 8.9-12.7 Female, 31-60day: 9.2-11.4 Male, 61-180day: 9.6-12.4 Female, 61-180day: 9.9-12.4 Male, 181d-<2year: 10.1-12.5 Female, 181d-<2year: 10.2-12.7 Male, 2-<6year: 10.2-12.7 Female, 2-<6year: 10.2-12.7 Male, 6-<12year: 10.7-13.4 Female, 6-<12year: 10.6-13.2 Male, 12-<18year: 11.0-14.5 Female, 12-<18year: 10.8-13.3 Male, 18-150year: 13.3-17.0 Female, 18-150year: 12.0-15.0	0-150 years, Critical Low: ≤ 7.0 >30d-150yrs, Critical High: ≥20.0	0-150 years, Critical Low: ≤ 7.0 >30d-150yrs, Critical High: ≥20.0	0-150 years, Critical Low: ≤ 7.0 >30d-150yrs, Critical High: ≥20.0	0-150 years, Critical Low: ≤ 7.0 >30d-150yrs, Critical High: ≥20.0	0-150 years, Critical Low: ≤ 7.0 >30d-150yrs, Critical High: ≥20.0	0-150 years, Critical Low: ≤ 7.0 >30d-150yrs, Critical High: ≥20.0
Oxyhemoglobin (O2 Hb)	%	N/A	N/A	96-98	N/A	N/A	N/A	N/A	N/A	
Carboxyhemoglobin (COHb)	%	0-1	Critical high only: > 3.0	0-1	Critical high only: > 3.0	N/A	N/A	N/A	N/A	
Methemoglobin (MetHb)	%	0-1.5	Critical high only: > 3.0	0-1.5	Critical high only: > 3.0	N/A	N/A	N/A	N/A	

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ECMO Pump Arterial

EC PUMP AR	Reference Range	Critical Values
E PH (Art)	7.35-7.45	< 7.35 or > 7.60
E PCO2 (Art)	35-45	< 20 or > 60
E PO2 (Art)	80-110	< 55
E BE Cal (Art)	N/A	N/A
E HCO3 (Art)	22-28	N/A
E O2 Sat (Art)	95-100	N/A

ECMO Pump Venous

EC PUMP Ven	Reference Range	Critical
E PH (Ven)	N/A	< 7.15 or > 7.59
E PCO2 (Ven)	N/A	< 19 or > 85
E PO2 (Ven)	N/A	N/A
E BE Cal (Ven)	N/A	N/A
E HCO3 (Ven)	N/A	N/A
E O2 Sat (Ven)	N/A	N/A

ECMO Blood Prime

EC B PRIME	Reference Range	Critical Values	Linear Low	Linear high
ECMO Blood Prime pH	N/A	N/A	N/A	N/A
ECMO Blood Prime pCO2	N/A	N/A	N/A	N/A
ECMO Blood Prime PO2	N/A	N/A	N/A	N/A
ECMO Blood Prime BE Cal	N/A	N/A	N/A	N/A
ECMO Blood Prime HCO3 Cal	N/A	N/A	N/A	N/A
ECMO Blood Prime O2 Sat	N/A	N/A	N/A	N/A
ECMO Blood Prime HGB	N/A	N/A	N/A	N/A
ECMO Blood Prime O2HB	N/A	N/A	N/A	N/A
ECMO Blood Prime COHB	N/A	N/A	N/A	N/A
ECMO Blood Prime MethB	N/A	N/A	N/A	N/A
ECMO Blood Prime Na	N/A	N/A	N/A	N/A
ECMO Blood Prime K	N/A	N/A	N/A	N/A
ECMO Blood Prime Cl	N/A	N/A	N/A	N/A
ECMO Blood Prime Ion Ca	N/A	N/A	N/A	N/A
ECMO Blood Prime Ion Mg	N/A	N/A	N/A	N/A
ECMO Blood Prime Glu	N/A	N/A	N/A	N/A
ECMO Blood Prime Lac	N/A	N/A	N/A	N/A
ECMO Blood Prime BUN	N/A	N/A	N/A	N/A
ECMO Blood Prime Creat	N/A	N/A	N/A	N/A