The most current laboratory reference ranges are included in the laboratory report from the LIS.
Laboratory testing information is also available on The Ohio State Wexner Medical Center Labs Test Catalog Website, https://theohiostatelabs.testcatalog.org/

This document applies all laboratory testing at OSUWMC Clinical Laboratories. This includes:

James Genetics Laboratories: 2001 Polaris Pkwy, Innovations Centre Suite 1500, Columbus OH 43240

Morehouse Laboratory: 1st Fl Morehouse Medical Plaza Tower, 2050 Kenny Rd, Columbus OH 43221

Spielman Laboratory: 1145 Olentangy River Rd Rm 2030, Columbus Oh 43212

Clinical Laboratories (UH): 410 West 10th Avenue, Columbus OH 43210

Clinical Laboratories (UHE): 181 Taylor Avenue, Columbus OH 43203

James West Campus Laboratory (JWC): 2121 Kenny Rd, Columbus, OH 43221

Test Name	Reference Values		Interpretation	Method Description	Source of Reference Range	Technical Range / AMR	Reportable Range / CRR
	Female	Male					
Arterial Blood Gas (Full Panel)	**PH** 0-29 days: 7.29-7.45 30+ days: 7.35-7.45 **PCO2** 0-29 days: 27-40 mm Hg 30+ days: 32-48 mm Hg **PO2** 83-108 mm Hg **HCO3** 0-29 days: 17-24 mmol/L 30+ days: 22-28 mmol/L **OSAT** 0-365 days: 40-90 % 1+ years: 94-98 % **BASE** -3.0-3.0 mmol/L **GLUC** 0-30 days: 55-115 mg/dL 31-182 days: 57-117 mg/dL 183-365 days: 70-126 mg/dL Nonfasting 1+ years: 70-179 mg/dL **LACT** 0.5-1.6 mmol/L **NA** 0-6 days: 133-146 mmol/L 7-30 days: 134-144 mmol/L 31-182 days: 134-142 mmol/L 183-365 days: 133-142 mmol/L 1+ years: 135-145 mmol/L **K** 0-7 days: 3.2-5.5 mmol/L 8-30 days: 3.4-6.0 mmol/L 31-182 days: 3.5-5.6 mmol/L 183-365 days: 3.5-6.1 mmol/L 1-17 years: 3.3-4.6 mmol/L 18+ years: 3.5-5.0 mmol/L **ICA** 4.60-5.30 mg/dL **BGHGB** 0-7 days: 13.4-20.0 g/dL 8-14 days: 13.4-20.0 g/dL 15-30 days: 10.8-14.6 g/dL 31-60 days: 9.2-11.4 g/dL 61-179 days: 9.9-12.4 g/dL 180-2 years: 10.2-12.7 g/dL 2-5 years: 10.2-12.7 g/dL 6-11 years: 10.6-13.2 g/dL 12-17 years: 10.8-13.3 g/dL 18+ years: 11.4-15.2 g/dL **BGHCT (Calculated)** 0-15 days: 40-60 % 15-30 days: 32-44 % 30-60 days: 29-34 % 60-180 days: 30-37 % 180-2 years: 31-38 % 2-6 years: 31-38 % 6-12 years: 32-40 % 12-18 years: 32-40 % 18+ years: 34-46 % **O2HGB** 94-98 % **COHGB** ≤1.5 % **MTHGB** ≤1.5 %	**PH** 0-29 days: 7.29-7.45 30+ days: 7.35-7.45 **PCO2** 0-29 days: 27-40 mm Hg 30+ days: 32-48 mm Hg **PO2** 83-108 mm Hg **HCO3** 0-29 days: 17-24 mmol/L 30+ days: 22-28 mmol/L **OSAT** 0-365 days: 40-90 % 1+ years: 94-98 % **BASE** -3.0-3.0 mmol/L **GLUC** 0-30 days: 55-115 mg/dL 31-182 days: 57-117 mg/dL 183-365 days: 70-126 mg/dL Nonfasting 1+ years: 70-179 mg/dL **LACT** 0.5-1.6 mmol/L **NA** 0-6 days: 133-146 mmol/L 7-30 days: 134-144 mmol/L 31-182 days: 134-142 mmol/L 183-365 days: 133-142 mmol/L 1+ years: 135-145 mmol/L **K** 0-7 days: 3.2-5.5 mmol/L 8-30 days: 3.4-6.0 mmol/L 31-182 days: 3.5-5.6 mmol/L 183-365 days: 3.5-6.1 mmol/L 1-17 years: 3.3-4.6 mmol/L 18+ years: 3.5-5.0 mmol/L **ICA** 4.60-5.30 mg/dL **BGHGB** 0-7 days: 13.9-19.1 g/dL 8-14 days: 13.9-19.1 g/dL 15-30 days: 10.0-15.3 g/dL 31-60 days: 8.9-12.7 g/dL 61-179 days: 9.6-12.4 g/dL 180-2 years: 10.1-12.5 g/dL 2-5 years: 10.2-12.7 g/dL 6-11 years: 10.7-13.4 g/dL 12-17 years: 11.0-14.5 g/dL 18+ years: 13.4-16.8 g/dL **BGHCT (Calculated)** 0-15 days: 42-57 % 15-30 days: 30-46 % 30-60 days: 27-38 % 60-180 days: 29-37 % 180-2 years: 30-38 % 2-6 years: 31-38 % 6-12 years: 32-40 % 12-18 years: 33-44 % 18+ years: 40-50 % **O2HGB** 94-98 % **COHGB** ≤1.5 % **MTHGB** ≤1.5 %		pO2, Glucose, Lactate: Amperometry pH, pCO2, K, Na, ICA: Potentiometry HCO3: Log (HCO3- (c)) = pH + log(pCO2) – 7.608 mmol/L HCT: 3.0 x tHb COHGB, MTHGB, O2HGB, Total HGB, sO2 : Oximetry Base excess: HCO3- – 24.8 + 16.2 x (pH - 7.4)	pH: Clinical Guide to Laboratory Tests 3rd Edition, Tietz, 1995. HCO3 Arterial: Blood Gases and Critical Care Testing Physiology, Clinical Interpretations, and Laboratory Applications. 3rd Edition, 2021 (p.3) 2012008B. sO2 Arterial: Clinical Guide to Laboratory Tests 3rd Edition, Tietz, 1995. pO2 Arterial: Clinical Guide to Laboratory Tests, Tietz, 1995 & Fundamentals of Clinical Chem, 1987. pCO2 Arterial: Clinical Guide to Laboratory Tests, Tietz, 1995 & Fundamentals of Clinical Chem, 1987 Base excess: Contemporary Practice in Clinical Chemistry 3rd Edition 2016. Chapter 32. Table 32-1 p450. Glucose: Clinical Guide to Laboratory Tests, 3rd Edition Tietz, 1995; Pediatric Reference Ranges, Soldin, 1999. Lactate: AIHL 800 Flex Reference Manual, 2008, verified by GEM Validation Study, 2021. Na: Blood Gases and Critical Care Testing Physiology, Clinical Interpretations, and Laboratory Applications. 3rd Edition, 2021 (p.165). Clinical Guide to Laboratory Tests Third Edition, Tietz, 1995. Lower limit adjusted and verified with GEM Validation Study, 2021. K: Clinical Guide to Laboratory Tests, Tietz 3rd Edition, 1995. Clinical Guide to Laboratory Tests, Tietz, 1995. Upper limit adjusted and verified with GEM Validation Study, 2021. ICA: Blood Gases and Critical Care Testing Physiology, Clinical Interpretations, and Laboratory Applications. 3rd Edition, 2021 (p.102). HCT: Derived from total hemoglobin reference interval based on GEM calculation of HCT. HGB: OSU Internal Normal Range Study, October 2018. Verified with GEM Validation Study, 2021. O2HGB, COHGB, MTHGB: AIHL 800 Flex Reference Manual 2008, verified by GEM Validation Study, 2021. Clinical Guide to Laboratory Tests Third Edition, Tietz, 1995. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics Sixth Edition, 2018.	**CCL GEM:** PH CCL: 7.00-7.92 PCO2: 18-125 mm Hg PO2: 35-529 mm Hg HCO3: 0-100 mmol/L sO2: 0-100 % BASE: -30.0-30.0 mmol/L GLUC: 16-685 mg/dL LACT: 0.3-17.0 mmol/L NA: 100-180 mmol/L K: 1.0-10.0 mmol/L LACT: 0.3-17.0 mmol/L ICA: 1.00-13.00 mg/dL BGHGB: 5.0-20.0 g/dL HCTc: 15-60% COHGB: 0.0-100% COHGB: 0.0-75.0 % MTHGB: 0.0-30 % **JWC and RT GEM:** PH: 6.80-7.92 PCO2: 18-125 mm Hg PO2: 35-529 mm Hg HCO3: 0-100 mmol/L sO2: 0-100 % FIO2: 40-100 % BASE: -30.0-30.0 mmol/L GLUC: 16-685 mg/dL LACT: 0.3-17.0 mmol/L NA: 100-180 mmol/L K: 1.0-10.0 mmol/L LACT: 0.3-17.0 mmol/L ICA: 1.00-13.00 mg/dL BGHGB: 5.0-20.0 g/dL HCTc: 15-60% COHGB: 0-100 % COHGB: 0.0-75.0 % MTHGB: 0.0-9.0 %	**CCL GEM:** PH CCL: 7.00-7.92 PCO2: 18-125 mm Hg PO2: 35-529 mm Hg HCO3: 0-100 mmol/L sO2: 0-100 % BASE: -30.0-30.0 mmol/L GLUC: 16-685 mg/dL LACT: 0.3-17.0 mmol/L NA: 100-180 mmol/L K: 1.0-10.0 mmol/L LACT: 0.3-17.0 mmol/L ICA: 1.00-13.00 mg/dL BGHGB: 5.0-20.0 g/dL HCTc: 15-60% COHGB: 0.0-100% MTHGB: 0.0-30 % **JWC and RT GEM:** PH: 6.80-7.92 PCO2: 18-125 mm Hg PO2: 35-529 mm Hg HCO3: 0-100 mmol/L sO2: 0-100 % FIO2: 40-100 % BASE: -30.0-30.0 mmol/L GLUC: 16-685 mg/dL LACT: 0.3-17.0 mmol/L NA: 100-180 mmol/L K: 1.0-10.0 mmol/L LACT: 0.3-17.0 mmol/L ICA: 1.00-13.00 mg/dL BGHGB: 5.0-20.0 g/dL HCTc: 15-60% O2HGB: 0-100 % COHGB: 0.0-75.0 % MTHGB: 0.0-9.0 %
Arterial Blood Gas	**PH** 0-29 days: 7.29-7.45 30+ days: 7.35-7.45 **PCO2** 0-29 days: 27-40 mm Hg 30+ days: 32-48 mm Hg **PO2** 83-108 mm Hg **HCO3** 0-29 days: 17-24 mmol/L 30+ days: 22-28 mmol/L **OSAT** 0-365 days: 40-90 % 1+ years: 94-98 % **BASE** -3.0-3.0 mmol/L			pO2: Amperometry pH, pCO2: Potentiometry Base excess: HCO3- – 24.8 + 16.2 x (pH - 7.4) HCO3: Log (HCO3- (c)) = pH + log(pCO2) – 7.608 mmol/L sO2: Oximetry	See Arterial Blood Gas (Full Panel)	See Arterial Blood Gas (Full Panel)	See Arterial Blood Gas (Full Panel)

Arterial Blood Gas Plus Serial Lactate	**PH** 0-29 days: 7.29-7.45 30+ days: 7.35-7.45 **PCO2** 0-29 days: 27-40 mm Hg 30+ days: 32-48 mm Hg **PO2** 83-108 mm Hg **HCO3** 0-29 days: 17-24 mmol/L 30+ days: 22-28 mmol/L **OSAT** 0-365 days: 40-90 % 1+ years: 94-98 % **BASE** -3.0-3.0 mmol/L **LACT** 0.5-1.6 mmol/L			pO2, Lactate: Amperometry pH, pCO2: Potentiometry Base excess: HCO3- - 24.8 + 16.2 x (pH - 7.4) HCO3: Log (HCO3- (c)) = pH + log(pCO2) – 7.608 mmol/L sO2: Oximetry	See Arterial Blood Gas (Full Panel)	See Arterial Blood Gas (Full Panel)	See Arterial Blood Gas (Full Panel)
Arterial Blood Gas, Umbilical Cord	**PH** 7.23-7.33 **PCO2** 41-58 mm Hg **PO2** 12-24 mm Hg **HCO3** 20-25 mmol/L **BASE** -3.0-3.0 mmol/L			pO2: Amperometry pH, pCO2: Potentiometry Base excess: HCO3- - 24.8 + 16.2 x (pH - 7.4) HCO3: Log (HCO3- (c)) = pH + log(pCO2) – 7.608 mmol/L sO2: Oximetry	pH, pCO2, pO2, HCO3: Clinical Guide to Laboratory Tests, Tietz 3rd Edition, 1995. sO2: Ilmi Journ Obst Gyn 8-2000 Vol 107 pp 987-994 Cord Bld O2 SAT in vigorous infants at birth: What is normal? Base: Email_Cord blood Gas RR Physician Established Base Excess_11-2020	PH: 7.00-7.92 PCO2: 18-125 mmHg PO2: 35-529 mmHg HCO3: 0-100 mmol/L OSAT: 0-100% BASE: -30.0-30.0 mmol/L	PH: 7.00-7.92 PCO2: 18-125 mmHg PO2: 35-529 mmHg HCO3: 0-100 mmol/L OSAT: 0-100% BASE: -30.0-30.0 mmol/L
Carboxyhemoglobin	≤1.5 %		Carboxyhemoglobin is elevated in patients exposed to high exogenous sources of carbon monoxide such as cigarette smoke, vehicle exhaust, etc. or increased endogenous production such as hemolysis.	Oximetry	See Arterial Blood Gas (Full Panel)	See Arterial Blood Gas (Full Panel)	See Arterial Blood Gas (Full Panel)
Cooximetry, Whole Blood	**MTHGB** ≤1.5 % **COHGB** ≤1.5 % **BGHGB** 0-7 days: 13.4-20.0 g/dL 8-14 days: 13.4-20.0 g/dL 15-30 days: 10.8-14.6 g/dL 31-60 days: 9.2-11.4 g/dL 61-179 days: 9.9-12.4 g/dL 180-2 years: 10.2-12.7 g/dL 2-5 years: 10.2-12.7 g/dL 6-11 years: 10.6-13.2 g/dL 12-17 years: 10.8-13.3 g/dL 18+ years: 11.4-15.2 g/dL **OSATA** 0-365 days: 40-90 % 1+ years: 94-98 % **OSATV** Venous sO2 lacks a defined reference range due to wide physiologic variability; please interpret clinically. **OSATMV** Venous sO2 lacks a defined reference range due to wide physiologic variability; please interpret clinically.	**MTHGB** ≤1.5 % **COHGB** ≤1.5 % **BGHGB** 0-7 days: 13.9-19.1 g/dL 8-14 days: 13.9-19.1 g/dL 15-30 days: 10.8-15.3 g/dL 31-60 days: 8.9-12.7 g/dL 61-179 days: 9.6-12.4 g/dL 180-2 years: 10.1-12.5 g/dL 2-5 years: 10.2-12.7 g/dL 6-11 years: 10.7-13.4 g/dL 12-17 years: 11.0-14.5 g/dL 18+ years: 13.4-16.8 g/dL **OSATA** 0-365 days: 40-90 % 1+ years: 94-98 % **OSATV** Venous sO2 lacks a defined reference range due to wide physiologic variability; please interpret clinically. **OSATMV** Venous sO2 lacks a defined reference range due to wide physiologic variability; please interpret clinically.		COHGB, MTHGB, O2HGB, Total HGB, sO2: Oximetry	See Arterial Blood Gas (Full Panel) and Venous Blood Gas (Full Panel)	See Arterial Blood Gas (Full Panel) and Venous Blood Gas (Full Panel)	See Arterial Blood Gas (Full Panel) and Venous Blood Gas (Full Panel)
Ionized Calcium (CRRT)			Post filter CRRT. When using Citrate anticoagulant protocol, the preferred targeted range is 1-2 mg/dL	Potentiometry	Email_ICA CRRT RR Physician Established 11-19-2020	1.00-13.00 mg/dL	1.00-13.00 mg/dL
Ionized Calcium, Serum	4.60-5.30 mg/dL			Potentiometry	Blood Gases and Critical Care Testing Physiology, Clinical Interpretations, and Laboratory Applications. 3rd Edition, 2021 (p.102).	1.00-13.00 mg/dL	1.00-13.00 mg/dL
Ionized Calcium, Whole Blood	4.60-5.30 mg/dL			Potentiometry	See Arterial Blood Gas (Full Panel)	See Arterial Blood Gas (Full Panel)	See Arterial Blood Gas (Full Panel)
Lactate, Whole Blood	0.5-1.6 mmol/L			Amperometry	See Arterial Blood Gas (Full Panel)	See Arterial Blood Gas (Full Panel)	See Arterial Blood Gas (Full Panel)
Lactate, Whole Blood, Serial	0.5-1.6 mmol/L			Amperometry		0.3-17.0 mmol/L	0.3-17.0 mmol/L
Methemoglobin	≤1.5 %			Oximetry	See Arterial Blood Gas (Full Panel)	See Arterial Blood Gas (Full Panel)	See Arterial Blood Gas (Full Panel)
pH, Pleural Fluid				Potentiometry		7.00-7.92	7.00-7.92
Potassium, Whole Blood	0-7 days: 3.2-5.5 mmol/L			Potentiometry	See Arterial Blood Gas (Full Panel)	See Arterial Blood Gas (Full Panel)	See Arterial Blood Gas (Full Panel)
Sodium, Whole Blood	0-6 days: 133-146 mmol/L			Potentiometry	See Arterial Blood Gas (Full Panel)	See Arterial Blood Gas (Full Panel)	See Arterial Blood Gas (Full Panel)
Total Hemoglobin	0-7 days: 13.4-20.0 g/dL 8-14 days: 13.4-20.0 g/dL 15-30 days: 10.8-14.6 g/dL 31-60 days: 9.2-11.4 g/dL 61-179 days: 9.9-12.4 g/dL 180-2 years: 10.2-12.7 g/dL 2-5 years: 10.2-12.7 g/dL 6-11 years: 10.6-13.2 g/dL 12-17 years: 10.8-13.3 g/dL 18+ years: 11.4-15.2 g/dL	0-7 days: 13.9-19.1 g/dL 8-14 days: 13.9-19.1 g/dL 15-30 days: 10.8-15.3 g/dL 31-60 days: 8.9-12.7 g/dL 61-179 days: 9.6-12.4 g/dL 180-2 years: 10.1-12.5 g/dL 2-5 years: 10.2-12.7 g/dL 6-11 years: 10.7-13.4 g/dL 12-17 years: 11.0-14.5 g/dL 18+ years: 13.4-16.8 g/dL		Oximetry	See Arterial Blood Gas (Full Panel)	See Arterial Blood Gas (Full Panel)	See Arterial Blood Gas (Full Panel)
Venous Blood Gas (Full Panel)	**PH** 7.32-7.43 **PCO2** 36-52 mm Hg **PO2** Venous pO2 is not recommended for the evaluation of oxygen status, clinical correlation is recommended. **HCO3** 23-29 mmol/L **OSAT** Venous sO2 lacks a defined reference range due to wide physiologic variability; please interpret clinically. **BASE** -3.0-3.0 mmol/L **GLUC** 0-30 days: 55-115 mg/dL 31-182 days: 57-117 mg/dL 183-365 days: 70-128 mg/dL Nonfasting 1+ years: 70-179 mg/dL **LACT** 0.5-1.6 mmol/L **NA** 0-6 days: 133-146 mmol/L 7-30 days: 134-144 mmol/L 31-182 days: 134-142 mmol/L 183-365 days: 133-142 mmol/L 1+ years: 135-145 mmol/L **K** 0-7 days: 3.2-5.5 mmol/L 8-30 days: 3.4-6.0 mmol/L 31-182 days: 3.5-5.8 mmol/L	**PH** 7.32-7.43 **PCO2** 36-52 mm Hg **PO2** Venous pO2 is not recommended for the evaluation of oxygen status, clinical correlation is recommended. **HCO3** 22-29 mmol/L **OSAT** Venous sO2 lacks a defined reference range due to wide physiologic variability; please interpret clinically. **BASE** -3.0-3.0 mmol/L **GLUC** 0-30 days: 55-115 mg/dL 31-182 days: 57-117 mg/dL 183-365 days: 70-128 mg/dL Nonfasting 1+ years: 70-179 mg/dL **LACT** 0.5-1.6 mmol/L **NA** 0-6 days: 133-146 mmol/L 7-30 days: 134-144 mmol/L 31-182 days: 134-142 mmol/L 183-365 days: 133-142 mmol/L 1+ years: 135-145 mmol/L **K** 0-7 days: 3.2-5.5 mmol/L 8-30 days: 3.4-6.0 mmol/L 31-182 days: 3 5-5.6 mmol/L		pO2, Glucose, Lactate: Amperometry pH, pCO2, K, Na, ICA: Potentiometry HCO3: Log (HCO3- (c)) = pH + log(pCO2) – 7.608 mmol/L	pH: Clinical Guide to Laboratory Tests 3rd Edition, Tietz, 1995. HCO3 Venous: Clinical Guide to Laboratory Tests 3rd Edition, Tietz, 1995. sO2 Venous: Blood Gas O2Sat: Radiometer Bulletin No: 44 Compendium of reference intervals pO2 Venous: Respirology. 2014 Feb;19(2):168-75, doi:10.1111/resp.122225. Pub 2014 Jan 3. © 2012 Radiometer Medical ApS. All rights reserved. 995-950. 201206B. pCO2 Venous: Respirology. 2014 Feb;19(2):168-75, doi:10.1111/resp.122225. Pub 2014 Jan 3. Base excess: Contemporary Practice in Clinical Chemistry 3rd Edition 2016. Chapter 32. Table 32-1 p450. Glucose: Clinical Guide to Laboratory Tests, 3rd Edition Tietz, 1995; Pediatric Reference Ranges, Soldin, 1999. Lactate: ABL 800 Flex Reference Manual, 2008, verified by GEM Validation Study, 2021.	**CLINICAL LAB UH GEM:** PH CCL: 7.00-7.92 PCO2: 18-125 mm Hg PO2: 35-529 mm Hg HCO3: 0-100 mmol/L sO2: 0-100 % BASE: -30.0-30.0 mmol/L GLUC: 16-685 mg/dL LACT: 0.3-17.0 mmol/L NA: 100-180 mmol/L K: 1.0-30.0 mmol/L LACT: 0.3-17.0 mmol/L ICA: 1.00-13.00 mg/dL BGHGB: 5.0-20.0 g/dL HCTc: 15-60% O2HGB: 0.0-100% COHGB: 0.0-75.0 % MTHGB: 0.0-30.%	**CLINICAL LAB UH GEM:** PH CCL: 7.00-7.92 PCO2: 18-125 mm Hg PO2: 35-529 mm Hg HCO3: 0-100 mmol/L sO2: 0-100 % BASE: -30.0-30.0 mmol/L GLUC: 16-685 mg/dL LACT: 0.3-17.0 mmol/L NA: 100-180 mmol/L K: 1.0-30.0 mmol/L LACT: 0.3-17.0 mmol/L ICA: 1.00-13.00 mg/dL BGHGB: 5.0-20.0 g/dL HCTc: 15-60% O2HGB: 0.0-100% COHGB: 0.0-75.0 % MTHGB: 0.0-30.%

	183-365 days: 3.5-6.1 mmol/L 1-17 years: 3.3-4.6 mmol/L 18+ years: 3.5-5.0 mmol/L **ICA** 4.60-5.30 mg/dL **BGHGB** 0-7 days: 13.4-20.0 g/dL 8-14 days: 13.4-20.0 g/dL 15-30 days: 10.8-14.6 g/dL 31-60 days: 9.2-11.4 g/dL 61-179 days: 9.9-12.4 g/dL 180-2 years: 10.2-12.7 g/dL 2-5 years: 10.2-12.7 g/dL 6-11 years: 10.6-13.2 g/dL 12-17 years: 10.8-13.3 g/dL 18+ years: 11.4-15.2 g/dL **BGHCT (Calculated)** 0-15 days: 40-60 % 15-30 days: 32-44 % 30-60 days: 28-34 % 60-180 days: 30-37 % 180-2 years: 31-38 % 2-6 years: 31-38 % 6-12 years: 32-40 % 12-18 years: 32-40 % 18+ years: 34-46 % **O2HGB** Venous O2Hb lacks a defined reference range due to wide physiologic variability; please interpret clinically. **COHGB** ≤1.5 % **MTHGB** ≤1.5 %	[illegible] 183-365 days: 3.5-6.1 mmol/L 1-17 years: 3.3-4.6 mmol/L 18+ years: 3.5-5.0 mmol/L **ICA** 4.60-5.30 mg/dL **BGHGB** 0-7 days: 13.9-19.1 g/dL 8-14 days: 13.9-19.1 g/dL 15-30 days: 10.0-15.3 g/dL 31-60 days: 8.9-12.7 g/dL 61-179 days: 9.6-12.4 g/dL 180-2 years: 10.1-12.5 g/dL 2-5 years: 10.2-12.7 g/dL 6-11 years: 10.7-13.4 g/dL 12-17 years: 11.0-14.5 g/dL 18+ years: 13.4-16.8 g/dL **BGHCT (Calculated)** 0-15 days: 42-57 % 15-30 days: 30-46 % 30-60 days: 27-38 % 60-180 days: 29-37 % 180-2 years: 30-38 % 2-6 years: 31-38 % 6-12 years: 32-40 % 12-18 years: 33-44 % 18+ years: 40-50 % **O2HGB** Venous O2Hb lacks a defined reference range due to wide physiologic variability; please interpret clinically. **COHGB** ≤1.5 % **MTHGB** ≤1.5 %		HCT: 3.0 x tHb COHGB, MTHGB, O2HGB, Total HGB, sO2: Oximetry Base excess: HCO3- - 24.8 + 16.2 x (pH - 7.4)	Na: Blood Gases and Critical Care Testing Physiology, Clinical Interpretations, and Laboratory Applications. 3rd Edition, 2021 (p.165). Clinical Guide to Laboratory Tests Third Edition, Tietz, 1995. Lower limit adjusted and verified with GEM Validation Study, 2021. K: Clinical Guide to Laboratory Tests, Tietz 3rd Edition, 1995. Clinical Guide to Laboratory Tests, Tietz, 1995. Upper limit adjusted and verified with GEM Validation Study, 2021. ICA: Blood Gases and Critical Care Testing Physiology, Clinical Interpretations, and Laboratory Applications. 3rd Edition, 2021 (p.102). HCT: Derived from total hemoglobin reference interval. ABL 800 FLEX Reference Manual, 2008. Derived from total hemoglobin reference interval based on GEM calculation of HCT. HGB: OSU Internal Normal Range Study, October 2018. Verified with GEM Validation Study, 2021. O2HGB, COHGB, MTHGB: ABL 800 Flex Reference Manual 2008, verified by GEM Validation Study, 2021. Clinical Guide to Laboratory Tests Third Edition, Tietz, 1995. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics Sixth Edition, 2018.	**CLINICAL LAB JWC AND RT GEM:** PH: 6.80-7.92 PCO2: 18-125 mm Hg PO2: 35-529 mm Hg HCO3: 0-100 mmol/L sO2: 0-100 % FIO2: 40-100 % BASE: -30.0-30.0 mmol/L GLUC: 16-685 mg/dL LACT: 0.3-17.0 mmol/L Na: 100-180 mmol/L K: 1.0-10.0 mmol/L LACT: 0.3-17.0 mmol/L ICA: 1.00-13.00 mg/dL BGHGB: 5.0-20.0 g/dL HCTc: 15-60% COHGB: 0-100 % COHGB: 0.0-75.0 % MTHGB: 0.0-9.0%	**CLINICAL LAB JWC AND RT GEM:** PH: 6.80-7.92 PCO2: 18-125 mm Hg PO2: 35-529 mm Hg HCO3: 0-100 mmol/L sO2: 0-100 % FIO2: 40-100 % BASE: -30.0-30.0 mmol/L GLUC: 16-685 mg/dL LACT: 0.3-17.0 mmol/L Na: 100-180 mmol/L K: 1.0-10.0 mmol/L LACT: 0.3-17.0 mmol/L ICA: 1.00-13.00 mg/dL BGHGB: 5.0-20.0 g/dL HCTc: 15-60% COHGB: 0-100 % COHGB: 0.0-75.0 % MTHGB: 0.0-9.0%
Venous Blood Gas	**PH** 7.32-7.43 **PCO2** 36-52 mm Hg **PO2** Venous pO2 is not recommended for the evaluation of oxygen status, clinical correlation is recommended. **HCO3** 22-29 mmol/L **OSAT** Venous sO2 lacks a defined reference range due to wide physiologic variability; please interpret clinically. **BASE** -3.0-3.0 mmol/L			pO2: Amperometry pH, pCO2: Potentiometry Base excess: HCO3- - 24.8 + 16.2 x (pH - 7.4) HCO3: Log (HCO3- (c)) = pH + log(pCO2) – 7.608 mmol/L sO2: Oximetry	See Venous Blood Gas (Full Panel)	See Venous Blood Gas (Full Panel)	See Venous Blood Gas (Full Panel)
Venous Blood Gas Plus Serial Lactate	**PH** 7.32-7.43 **PCO2** 36-52 mm Hg **PO2** Venous pO2 is not recommended for the evaluation of oxygen status, clinical correlation is recommended. **HCO3** 22-29 mmol/L **OSAT** Venous sO2 lacks a defined reference range due to wide physiologic variability; please interpret clinically. **BASE** -3.0-3.0 mmol/L **LACT** 0.5-1.6 mmol/L			pO2, Lactate: Amperometry pH, pCO2: Potentiometry Base excess: HCO3- - 24.8 + 16.2 x (pH - 7.4) HCO3: Log (HCO3- (c)) = pH + log(pCO2) – 7.608 mmol/L sO2: Oximetry	See Venous Blood Gas (Full Panel)	See Venous Blood Gas (Full Panel)	See Venous Blood Gas (Full Panel)
Venous Blood Gas, Umbilical Cord	**PH** 7.30-7.40 **PCO2** 33-44 mm Hg **PO2** 23-35 mm Hg **HCO3** 16-25 mmol/L **BASE** -2.0-2.0 mmol/L			pO2: Amperometry pH, pCO2: Potentiometry Base excess: HCO3- - 24.8 + 16.2 x (pH - 7.4) HCO3: Log (HCO3- (c)) = pH + log(pCO2) – 7.608 mmol/L sO2: Oximetry	pCO2, pH, pO2, HCO3: Clinical Guide to Laboratory Tests, Tietz 3rd Edition, 1995. Base: Email_Cord blood Gas RR Physician Established Base Excess_11-2020. sO2: Brit Journ Obst Gyn 8-2000 Vol 107 pp 987-994 Cord Bld O2 SAT in vigorous infants at birth: What is normal?	PH: 7.00-7.92 PCO2: 18-125 mmHg PO2: 35-529 mmHg HCO3: 0-100 mmol/L OSAT: 0.7-100% BASE: -30.0-30.0 mmol/L	PH: 7.00-7.92 PCO2: 18-125 mmHg PO2: 35-529 mmHg HCO3: 0-100 mmol/L OSAT: 0.7-100% BASE: -30.0-30.0 mmol/L
1 Hour Post Glucola	70-134 mg/dL			Photometric rate with hexokinase	ADA Standards October 2012, Clinical Guide to Laboratory Tests, Tietz, 1995; Pediatric Reference Ranges, Soldin, 1999	10-800 mg/dL	10-2,400 mg/dL
Acetaminophen Level	≤150.0 mcg/mL			Enzyme immunoassay	Applied Pharmacokinetics: Principles of Therapeutic Drug Monitoring, 2nd Edition 2002 Applied Therapeutics, Inc. and Micromedex On OSU Intranet.	10.0-200.0 mcg/mL	10.0-600.0 mcg/mL
Albumin-Adjusted Calcium	**ALB** 0-30 days: 2.7-4.3 g/dL 31-182 days: 2.9-4.2 g/dL 183-365 days: 3.3-4.8 g/dL 1-19 years: 2.9-4.2 g/dL 19+ years: 3.5-5.0 g/dL **CA** 0-30 days: 8.4-10.6 mg/dL 31-365 days: 8.9-10.5 mg/dL 1+ years: 8.6-10.5 mg/dL	**ALB** 0-30 days: 2.6-4.1 g/dL 31-182 days: 2.8-4.6 g/dL 183-365 days: 2.8-4.8 g/dL 1-19 years: 3.2-4.7 g/dL 19+ years: 3.5-5.0 g/dL **CA** 0-30 days: 8.5-10.6 mg/dL 31-365 days: 8.7-10.5 mg/dL 1+ years: 8.6-10.5 mg/dL		**ALB** Colorimetric; Bromocresol green **CA** Photometric; arsenazo **AAC** Total calcium mg/dL + 0.8*(4-albumin g/dL)	See individual analytes	See individual analytes	See individual analytes
Albumin	0-30 days: 2.7-4.3 g/dL 31-182 days: 2.9-4.2 g/dL 183-365 days: 3.3-4.8 g/dL 1-19 years: 2.9-4.2 g/dL 19+ years: 3.5-5.0 g/dL	0-30 days: 2.6-4.1 g/dL 31-182 days: 2.8-4.6 g/dL 183-365 days: 2.8-4.8 g/dL 1-19 years: 3.2-4.7 g/dL 19+ years: 3.5-5.0 g/dL		Colorimetric; Bromocresol green	Tietz 2nd Edition referenced by Beckman Coulter IFU for recumbent adult and verified by OSUWMC Reference Interval Study 2021.	1.5-6.0 g/dL	1.5-18.0 g/dL
Albumin, CSF	10.0-30.0 mg/dL			Turbidimetric	CCLM Vol 54 issue 2 e285-292 Feb 2016.	1.0-45.0 mg/dL	1.0-450.0 mg/dL
Albumin, Fluid			**Pleural:** Serum- pleural fluid albumin gradients of >1.2 g/dL are consistent with transudates. **Peritoneal:** Serum-ascites albumin gradient (SAAG) of 1.1 g/dL or greater suggests portal hypertension. **Pericardial:** The reference range has not been established for this fluid specimen. The fluid results should be compared with the concentration in serum/plasma or integrated into the clinical context for interpretation.	Colorimetric; Bromocresol green	Pleural: Roth, B.J., et.al. Chest, Vol 98, 546-549, 1990. Peritoneal: Runyon, B.A. Ann Intern Med. 1992;117:215-220.	0.5-6.0 g/dL	0.5-6.0 g/dL
Alcohol (Ethanol), Blood	<10 mg/dL		10-50 mg/dL - effects of alcohol may or may not be apparent 50-120 mg/dL - mild euphoria and/or impairment 180-300 mg/dL - disorientation, confusion, dizziness 350-500 mg/dL - unconsciousness, coma, circulation and respiration impairment, possible death > 450 mg/dL- possible death due to respiration impairment Concentrations of blood alcohol causing impairment and/or intoxication may vary by person.	Enzymatic using alcohol dehydrogenase		10-600 mg/dL	10-600 mg/dL

Alk Phosphatase	0-30 days: 48-406 U/L 31-365 days: 124-341 U/L 1-3 years: 108-317 U/L 4-6 years: 96-297 U/L 7-9 years: 69-325 U/L 10-12 years: 51-332 U/L 13-15 years: 50-162 U/L 16-18 years: 47-119 U/L 19+ years: 32-126 U/L	0-30 days: 75-316 U/L 31-365 days: 82-383 U/L 1-3 years: 104-345 U/L 4-6 years: 93-309 U/L 7-9 years: 86-315 U/L 10-12 years: 42-362 U/L 13-15 years: 74-390 U/L 16-18 years: 52-171 U/L 19+ years: 32-126 U/L		Photometric rate with p-nitro-phenylphosphate (pNPP) in the presence of 2-amino-2-methyl-1-propanol (AMP) at pH 10.4.	OSUWMC Reference Range Study effective 12.11.2013; Verified by OSUWMC Reference Interval Study 2021. Pediatric Reference Ranges, Soldin, 1999 /Synchron Performance Verification Manual A22319	5-1,500 U/L	5-15,000 U/L
ALP ALT AST	**ALP** 0-30 days: 48-406 U/L 31-365 days: 124-341 U/L 1-3 years: 108-317 U/L 4-6 years: 96-297 U/L 7-9 years: 69-325 U/L 10-12 years: 51-332 U/L 13-15 years: 50-162 U/L 16-18 years: 47-119 U/L 19+ years: 32-126 U/L **ALT** 0-30 days: 8-25 U/L 31 days-4 years: 8-30 U/L 4-6 years: 8-25 U/L 7-9 years: 8-25 U/L 10-17 years: 8-20 U/L 18+ years: 9-48 U/L **AST** 0-30 days: 0-49 U/L 31-365 days: 0-80 U/L 1-3 years: 0-70 U/L 4-6 years: 0-60 U/L 7-9 years: 0-42 U/L 10-12 years: 0-38 U/L 13-15 years: 0-33 U/L 16-18 years: 0-31 U/L 19+ years: 10-39 U/L	**ALP** 0-30 days: 75-316 U/L 31-365 days: 82-383 U/L 1-3 years: 104-345 U/L 4-6 years: 93-309 U/L 7-9 years: 86-315 U/L 10-12 years: 42-362 U/L 13-15 years: 74-390 U/L 16-18 years: 52-171 U/L 19+ years: 32-126 U/L **ALT** 0-30 days: 8-25 U/L 31-365 days: 8-35 U/L 1-3 years: 8-30 U/L 4-6 years: 8-20 U/L 7-9 years: 8-25 U/L 10-17 years: 8-30 U/L 18+ years: 10-52 U/L **AST** 0-30 days: 0-52 U/L 31-365 days: 0-66 U/L 1-3 years: 0-57 U/L 4-6 years: 0-49 U/L 7-9 years: 0-43 U/L 10-12 years: 0-39 U/L 13-15 years: 0-40 U/L 16-18 years: 0-40 U/L 19+ years: 10-39 U/L		**ALP** Photometric rate with p-nitro-phenylphosphate (pNPP) in the presence of 2-amino-2-methyl-1-propanol (AMP) at pH 10.4. **ALT** Photometric rate with alanine to α-oxoglutarate to form pyruvate and glutamate. This assay does not contain pyridoxyl-5-phosphate. **AST** Photometric rate with aspartate and α-oxoglutarate to form pyruvate and glutamate. This assay does not contain pyridoxyl-5-phosphate.	See individual analytes	See individual analytes	See individual analytes
ALP ALT AST LD	**ALP** 0-30 days: 48-406 U/L 31-365 days: 124-341 U/L 1-3 years: 108-317 U/L 4-6 years: 96-297 U/L 7-9 years: 69-325 U/L 10-12 years: 51-332 U/L 13-15 years: 50-162 U/L 16-18 years: 47-119 U/L 19+ years: 32-126 U/L **ALT** 0-30 days: 8-25 U/L 31 days-4 years: 8-30 U/L 4-6 years: 8-25 U/L 7-9 years: 8-25 U/L 10-17 years: 8-20 U/L 18+ years: 9-48 U/L **AST** 0-30 days: 0-49 U/L 31-365 days: 0-80 U/L 1-3 years: 0-70 U/L 4-6 years: 0-60 U/L 7-9 years: 0-42 U/L 10-12 years: 0-38 U/L 13-15 years: 0-33 U/L 16-18 years: 0-31 U/L 19+ years: 10-39 U/L **LD** 0-30 days: 145-765 U/L 31-365 days: 190-420 U/L 1-3 years: 165-395 U/L 4-6 years: 135-345 U/L 7-9 years: 140-280 U/L 10-12 years: 120-260 U/L 13-15 years: 100-275 U/L 16-18 years: 105-230 U/L 19+ years: 100-190 U/L	**ALP** 0-30 days: 75-316 U/L 31-365 days: 82-383 U/L 1-3 years: 104-345 U/L 4-6 years: 93-309 U/L 7-9 years: 86-315 U/L 10-12 years: 42-362 U/L 13-15 years: 74-390 U/L 16-18 years: 52-171 U/L 19+ years: 32-126 U/L **ALT** 0-30 days: 8-25 U/L 31-365 days: 8-35 U/L 1-3 years: 8-30 U/L 4-6 years: 8-20 U/L 7-9 years: 8-25 U/L 10-17 years: 8-30 U/L 18+ years: 10-52 U/L **AST** 0-30 days: 0-52 U/L 31-365 days: 0-66 U/L 1-3 years: 0-57 U/L 4-6 years: 0-49 U/L 7-9 years: 0-43 U/L 10-12 years: 0-39 U/L 13-15 years: 0-40 U/L 16-18 years: 0-40 U/L 19+ years: 10-39 U/L **LD** 0-30 days: 125-735 U/L 31-365 days: 170-450 U/L 1-3 years: 155-345 U/L 4-6 years: 155-345 U/L 7-9 years: 145-300 U/L 10-12 years: 120-325 U/L 13-15 years: 120-290 U/L 16-18 years: 105-235 U/L 19+ years: 100-190 U/L		**ALP** Photometric rate with p-nitro-phenylphosphate (pNPP) in the presence of 2-amino-2-methyl-1-propanol (AMP) at pH 10.4. **ALT** Photometric rate with alanine to α-oxoglutarate to form pyruvate and glutamate. This assay does not contain pyridoxyl-5-phosphate. **AST** Photometric rate with aspartate and α-oxoglutarate to form pyruvate and glutamate. This assay does not contain pyridoxyl-5-phosphate. **LD** Photometric rate	See individual analytes	See individual analytes	See individual analytes
ALP ALT AST LD GGT BILI	**ALP** 0-30 days: 48-406 U/L 31-365 days: 124-341 U/L 1-3 years: 108-317 U/L 4-6 years: 96-297 U/L 7-9 years: 69-325 U/L 10-12 years: 51-332 U/L 13-15 years: 50-162 U/L 16-18 years: 47-119 U/L 19+ years: 32-126 U/L **ALT** 0-30 days: 8-25 U/L 31 days-4 years: 8-30 U/L 4-6 years: 8-25 U/L 7-9 years: 8-25 U/L 10-17 years: 8-20 U/L 18+ years: 9-48 U/L **AST** 0-30 days: 0-49 U/L 31-365 days: 0-80 U/L 1-3 years: 0-70 U/L 4-6 years: 0-60 U/L 7-9 years: 0-42 U/L 10-12 years: 0-38 U/L 13-15 years: 0-33 U/L 16-18 years: 0-31 U/L 19+ years: 10-39 U/L **LD** 0-30 days: 145-765 U/L 31-365 days: 190-420 U/L 1-3 years: 165-395 U/L 4-6 years: 135-345 U/L 7-9 years: 140-280 U/L 10-12 years: 120-260 U/L 13-15 years: 100-275 U/L 16-18 years: 105-230 U/L 19+ years: 100-190 U/L **GGT** 0-182 days: 15-132 U/L 183-365 days: 8-39 U/L 1-12 years: 8-22 U/L 13-18 years: 8-24 U/L 19+ years: 8-64 U/L **TBIL** 0-1 day: 1.4-8.7 mg/dL 1-2 days: 3.4-11.5 mg/dL 3-4 days: 1.5-12.0 mg/dL 5-365 days: 0.3-1.2 mg/dL 1+ years: <1.5 mg/dL **DBIL** All: <0.3 mg/dL	**ALP** 0-30 days: 75-316 U/L 31-365 days: 82-383 U/L 1-3 years: 104-345 U/L 4-6 years: 93-309 U/L 7-9 years: 86-315 U/L 10-12 years: 42-362 U/L 13-15 years: 74-390 U/L 16-18 years: 52-171 U/L 19+ years: 32-126 U/L **ALT** 0-30 days: 8-25 U/L 31-365 days: 8-35 U/L 1-3 years: 8-30 U/L 4-6 years: 8-20 U/L 7-9 years: 8-25 U/L 10-17 years: 8-30 U/L 18+ years: 10-52 U/L **AST** 0-30 days: 0-52 U/L 31-365 days: 0-66 U/L 1-3 years: 0-57 U/L 4-6 years: 0-49 U/L 7-9 years: 0-43 U/L 10-12 years: 0-39 U/L 13-15 years: 0-40 U/L 16-18 years: 0-40 U/L 19+ years: 10-39 U/L **LD** 0-30 days: 125-735 U/L 31-365 days: 170-450 U/L 1-3 years: 155-345 U/L 4-6 years: 155-345 U/L 7-9 years: 145-300 U/L 10-12 years: 120-325 U/L 13-15 years: 120-290 U/L 16-18 years: 105-235 U/L 19+ years: 100-190 U/L **GGT** 0-182 days: 12-122 U/L 183-365 days: 8-39 U/L 1-12 years: 8-22 U/L 13-18 years: 8-42 U/L 19+ years: 8-64 U/L **TBIL** 0-1 day: 1.4-8.7 mg/dL 1-2 days: 3.4-11.5 mg/dL 3-4 days: 1.5-12.0 mg/dL 5-365 days: 0.3-1.2 mg/dL 1+ years: <1.5 mg/dL **DBIL** All: <0.3 mg/dL		**ALP** Photometric rate with p-nitro-phenylphosphate (pNPP) in the presence of 2-amino-2-methyl-1-propanol (AMP) at pH 10.4. **ALT** Photometric rate with alanine to α-oxoglutarate to form pyruvate and glutamate. This assay does not contain pyridoxyl-5-phosphate. **AST** Photometric rate with aspartate and α-oxoglutarate to form pyruvate and glutamate. This assay does not contain pyridoxyl-5-phosphate. **LD** Photometric rate **GGT** Photometric rate **DBIL** Photometric with diazonium salt, 3,5-dichloroaniline (DPD). **TBIL** Photometric with 3,5-dichlorophenyldiazonium tetrafluoroborate (DPD), and caffeine and a surfactant as accelerators.	See individual analytes	See individual analytes	See individual analytes
Alpha 1 Antitrypsin	84-210 mg/dL			Turbidometry	Package Insert. Verified by OSUWMC Reference Interval Study 2021.	30-500 mg/dL	30-5,000 mg/dL
ALT	0-30 days: 8-25 U/L 31 days-4 years: 8-30 U/L 4-6 years: 8-25 U/L 7-9 years: 8-25 U/L 10-17 years: 8-20 U/L 18+ years: 9-48 U/L	0-30 days: 8-25 U/L 31-365 days: 8-35 U/L 1-3 years: 8-30 U/L 4-6 years: 8-20 U/L 7-9 years: 8-25 U/L 10-17 years: 8-30 U/L 18+ years: 10-52 U/L		Photometric rate with alanine to α-oxoglutarate to form pyruvate and glutamate. This assay does not contain pyridoxyl-5-phosphate.	OSUWMC Reference Range Study effective 12.11.2013; verified by OSUWMC Reference Interval Study 2021. Pediatric Reference Ranges, Soldin, 1999 (Lower end of reference range modified to agree with the linear limits.)	3-500 U/L	3-25,000 U/L
Ammonia	6-47 µmol/L			Photometric	Package insert.	10-600 µmol/L	10-3,000 µmol/L
Ammonia, Arterial	6-47 µmol/L			Photometric	Package insert.	10-600 µmol/L	10-3,000 µmol/L

AMY LIPA	**AMY** 0-30 days: 0-6 U/L 31-182 days: 1-17 U/L 183-365 days: 6-44 U/L 1-3 years: 8-79 U/L 4-9 years: 16-91 U/L 10-18 years: 19-76 U/L 19+ years: 28-103 U/L **LIPA** 0-30 days: 6-55 U/L 31-182 days: 4-29 U/L 183-365 days: 4-23 U/L 1-3 years: 4-31 U/L 4-9 years: 3-32 U/L 10-18 years: 4-29 U/L 19+ years: 11-82 U/L			Photometric rate	See individual analytes	See individual analytes	See individual analytes
Amylase	0-30 days: 0-6 U/L			Photometric rate	Prior study verified by OSUWMC Reference Interval Study 2021.	10-2,000 U/L	10-10,000 U/L
Amylase, Body Fluid			**Pleural:** Pleural fluid rich in amylase (fluid amylase to serum/plasma amylase ratio > 1) is associated with acute and chronic pancreatitis, esophageal leakage, malignancy, cirrhosis, or pneumonia. **Pancreatic cyst:** Very low pancreatic cyst fluid amylase concentrations (< 250 U/L) exclude a pseudocyst in the majority of cases. **Peritioneal, Drainage, PFUN:** The reference range has not been established for this fluid specimen. The fluid results should be compared with the concentration in serum/plasma or integrated into the clinical context for interpretation.	Photometric rate	Pleural: State of the art. The pleura Sahn SA Am Rev Respir Dis. 1988;138(1):184. Pancreatic cyst: Elta GH, et al. Am J Gastroenterol. 208;113:464-479.	10-2,000 U/L	10-10,000 U/L
Amylase, Urine Random			The reference range has not been established for random urine specimens. The test result should be integrated into the clinical context for interpretation.	Photometric rate	Prior study verified by OSUWMC Reference Interval Study 2021.	10-1,500 U/L	10-75,000 U/L
Amylase, 24 Hour Urine	0-400 U/24 hrs			Photometric rate	Prior study verified by OSUWMC Reference Interval Study 2021.		
Angiotensin Converting Enzyme	19-123 U/L			Furchesolol-Phenylalanol-Glycylsbrcine	Calculated reference range based on correlation study with Mayo Clinic	14-143 U/L	14-1,450 U/L
Anti Streptolysin O	<250 IU/mL			Turbidimetry	Package Insert. Verified by OSUWMC Reference Interval Study 2021.	100-1,000 IU/mL	100-10,000 IU/mL
Apolipoprotein B	<90 mg/dL		ApoB < 90 mg/dL is considered desirable. ApoB ≥ 130 mg/dL is considered risk-enhacing for ASCVD.	Immunoturbidimetric assay	2018 AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA Guideline on theManagement of Blood Cholesterol. Grundy SM, et al. J Am Coll Cardiol. 2019.	40-200 mg/dL	40-200 mg/dL
AST	0-30 days: 0-49 U/L 31-365 days: 0-80 U/L 1-3 years: 0-70 U/L 4-6 years: 0-60 U/L 7-9 years: 0-42 U/L 10-12 years: 0-38 U/L 13-15 years: 0-33 U/L 16-18 years: 0-31 U/L 19+ years: 10-39 U/L	0-30 days: 0-52 U/L 31-365 days: 0-66 U/L 1-3 years: 0-57 U/L 4-6 years: 0-49 U/L 7-9 years: 0-43 U/L 10-12 years: 0-39 U/L 13-15 years: 0-40 U/L 16-18 years: 0-40 U/L 19+ years: 10-39 U/L		Photometric rate with aspartate and α-oxoglutarate to form pyruvate and glutamate. This assay does not contain pyridoxyl-5-phosphate.	Verified by OSUWMC Reference Interval Study 2021.	3-1,000 U/L	3-50,000 U/L
Basic Metabolic Panel	**NA** 0-6 days: 133-146 mmol/L 7-30 days: 134-144 mmol/L 31-182 days: 134-142 mmol/L 183-365 days: 133-142 mmol/L 1+ years: 135-145 mmol/L **K** 0-7 days: 3.2-5.5 mmol/L 8-30 days: 3.4-6.0 mmol/L 31-182 days: 3.5-5.6 mmol/L 183-365 days: 3.5-6.1 mmol/L 1-17 years: 3.3-4.6 mmol/L 18+ years: 3.5-5.0 mmol/L **CL** 0-365 days: 98-113 mmol/L 1-17 years: 102-112 mmol/L 18+ years: 98-108 mmol/L **CO2** 0-2 years: 13-29 mmol/L 3+ years: 21-31 mmol/L **GLUC** 0-30 days: 55-115 mg/dL 31-182 days: 57-117 mg/dL 183-365 days: 70-126 mg/dL Fasting 1+ years: 70-99 mg/dL Nonfasting 1+years: 70-179 mg/dL **BUN** 7-25 mg/dL **CREA** 0-30 days: 0.50-0.90 mg/dL 31-365 days: 0.40-0.60 mg/dL 1-3 years: 0.40-0.70 mg/dL 4-6 years: 0.50-0.80 mg/dL 7-9 years: 0.50-0.90 mg/dL 10-12 years: 0.60-1.00 mg/dL 13-15 years: 0.70-1.10 mg/dL 16-18 years: 0.80-1.20 mg/dL 19+ years: 0.50-1.20 mg/dL **CA** 0-30 days: 8.4-10.6 mg/dL 31-365 days: 8.9-10.5 mg/dL 1+ years: 8.6-10.5 mg/dL **OSMO CALC** 278-305 mOsm/kg **ANION GAP** 7-17 mmol/L **eGFR** ≥60 mL/min/1.73m2	**NA** 0-6 days: 133-146 mmol/L 7-30 days: 134-144 mmol/L 31-182 days: 134-142 mmol/L 183-365 days: 133-142 mmol/L 1+ years: 135-145 mmol/L **K** 0-7 days: 3.2-5.5 mmol/L 8-30 days: 3.4-6.0 mmol/L 31-182 days: 3.5-5.6 mmol/L 183-365 days: 3.5-6.1 mmol/L 1-17 years: 3.3-4.6 mmol/L 18+ years: 3.5-5.0 mmol/L **CL** 0-365 days: 98-113 mmol/L 1-17 years: 102-112 mmol/L 18+ years: 98-108 mmol/L **CO2** 0-2 years: 13-29 mmol/L 3+ years: 21-31 mmol/L **GLUC** 0-30 days: 55-115 mg/dL 31-182 days: 57-117 mg/dL 183-365 days: 70-126 mg/dL Fasting 1+ years: 70-99 mg/dL Nonfasting 1+years: 70-179 mg/dL **BUN** 7-25 mg/dL **CREA** 0-30 days: 0.50-1.20 mg/dL 31-365 days: 0.40-0.70 mg/dL 1-3 years: 0.40-0.70 mg/dL 4-6 years: 0.50-0.80 mg/dL 7-9 years: 0.60-0.90 mg/dL 10-12 years: 0.60-1.00 mg/dL 13-15 years: 0.60-1.20 mg/dL 16-18 years: 0.80-1.40 mg/dL 19+ years: 0.70-1.30 mg/dL **CA** 0-30 days: 8.5-10.6 mg/dL 31-365 days: 8.7-10.5 mg/dL 1+ years: 8.6-10.5 mg/dL **OSMO CALC** 278-305 mOsm/kg **ANION GAP** 7-17 mmol/L **eGFR** ≥60 mL/min/1.73m2		**NA/KCL** Indirect ion-selective electrode **CO2** Photometric **GLUC** Photometric rate with hexokinase **BUN** Photometric rate **CREA** Kinetic Jaffe **CA** Photometric, arsenazo **ANION GAP** (Na + K) – (Cl + CO2) **eGFR** eGFRcr = 142 x min(Scr/κ, 1)α x max(Scr/κ, 1)-1.200 x 0.9938Age x 1.012 [if female] Where κ = 0.7 (females) or 0.9 (males) α = -0.241 (female) or -0.302 (male) Scr = serum creatinine in mg/dL, divide by 88.4 for creatinine in μmol/L Age (years) The "min(Scr/κ, 1)" factor indicates the minimum of Scr/κ or 1.0 and "max(Scr/κ, 1)" indicates the maximum of Scr/κ or 1.0. **OSMO CALC** (1.86 (Na +K) + 1.15 (Glucose/18) + (Urea/2.8) + 14 where Na and K are in mmol/L; Glucose and Urea are in mg/dL	See individual analytes	See individual analytes	See individual analytes
Beta hCG, Qual, Blood			Negative	Lateral-flow test using a monoclonal antibody specific to the beta subunit of hCG.	Package insert		Negative, Positive
Beta hCG, Quant, Blood			Non-pregnant: <10 mIU/mL Postmenopause: <10 mIU/mL Male: <10 mIU/mL FEMALE GESTATIONAL AGE 2-4 Weeks: 39.1-8,388 mIU/mL 5-6 Weeks: 861-88,769 mIU/mL 6-8 Weeks: 8,636-218,085 mIU/mL 8-10 Weeks: 18,700-244,467 mIU/mL 10-12 Weeks: 23,143-181,899 mIU/mL 13-27 Weeks: 6,303-97,171 mIU/mL 24-40 Weeks: 4,360-74,883 mIU/mL Test results cannot be interpreted as absolute evidence for the presence or absence of malignant disease.	Two-site sandwich immunoassay chemiluminescent.	Advia Centaur tHCG Package Insert 10634917_EN Rev. F, 2011-04	2.6-1,000.0 mIU/mL	2.6-128,000,000.0 mIU/mL
Beta-Hydroxybutyrate, Serum	<0.27 mmol/L			Photometric	Stanbio Package Insert and verified by OSUWMC Reference Interval Study 2021.	0.10-8.00 mmol/L	0.10-24.00 mmol/L
Bicarbonate, Fluid			**Stool:** The reference range has not been established for this fluid specimen. The fluid results should be compared with the concentration in serum/plasma or integrated into the clinical context for interpretation. **PFUN:** Measurement of secretin stimulated electrolytes and enzymes in pancreatic fluid may correlate with the degree of pancreas function. Peak bicarbonate values > 75 mmol/L for screening (time 15 minutes) and >80 mmol/L for confirmatory (time 60 minutes) tests suggest normal pancreas function.	Photometric		5-45 mmol/L	5-90 mmol/L
Bilirubin - Baby	**DBIL** <0.3 mg/dL **TBIL** 0-1 day: 1.4-8.7 mg/dL 1-2 days: 3.4-11.5 mg/dL 3-4 days: 1.5-12.0 mg/dL 5-365 days: 0.3-1.2 mg/dL			**DBIL** Photometric with diazonium salt, 3,5-dichloroaniline (DPD). **TBIL** Photometric with 3,5-dichlorophenyldiazonium tetrafluoroborate (DPD), and caffeine and a surfactant as accelerators.	See individual analytes	See individual analytes	See individual analytes
Bilirubin Direct	<0.3 mg/dL			Photometric with diazonium salt, 3,5-dichloroaniline (DPD).	Clinical Guide to Laboratory Tests, Tietz 1995, verified by OSUWMC Reference Interval Study 2021.	>10.0 mg/dL	0.1-20.0 mg/dL
Bilirubin Total	0-1 day: 1.4-8.7 mg/dL 1-2 days: 3.4-11.5 mg/dL 3-4 days: 1.5-12.0 mg/dL			Photometric with 3,5-dichlorophenyldiazonium tetrafluoroborate (DPD), and caffeine and a surfactant as accelerators.	Clinical Guide to Laboratory Tests, Tietz 1995, verified by OSUWMC Reference Interval Study 2021.	0.1-30.0 mg/dL	0.1-90.0 mg/dL

Bilirubin, Total and Direct	**DBIL** <0.3 mg/dL **TBIL** 0-1 day: 1.4-8.7 mg/dL 1-2 days: 3.4-11.5 mg/dL 3-4 days: 1.5-12.0 mg/dL 5-365 days: 0.3-1.2 mg/dL				**DBIL** Photometric with diazonium salt, 3,5-dichloroaniline (DPD). **TBIL** Photometric with 3,5-dichlorophenyldiazonium tetrafluoroborate (DPD), and caffeine and a surfactant as accelerators.	See individual analytes	See individual analytes	See individual analytes
Bilirubin, Total, Fluid			**Peritoneal:** Peritoneal bilirubin concentrations greater than that of serum/plasma may suggest bile within the abdomen. **Drainage:** Drain fluid bilirubin concentration-to-serum/plasma bilirubin concentration ratios exceeding 5 indicates bile leakage.		Photometric with 3,5-dichlorophenyldiazonium tetrafluoroborate (DPD), and caffeine and a surfactant as accelerators.	Peritoneal: Ramyon BA J Clin Gastroenterol. 1987;9(5):543. Drain: Darwin. Gastrointestinal Endosc. 2010 Jan;71(1):99-104.	0.1-30.0 mg/dL	0.1-90.0 mg/dL
BMP without Glucose	**NA** 0-6 days: 133-146 mmol/L 7-30 days: 134-144 mmol/L 31-182 days: 134-142 mmol/L 183-365 days: 133-142 mmol/L 1+ years: 135-145 mmol/L **K** 0-7 days: 3.2-5.5 mmol/L 8-30 days: 3.4-6.0 mmol/L 31-182 days: 3.5-5.8 mmol/L 183-365 days: 3.5-6.1 mmol/L 1-17 years: 3.3-4.6 mmol/L 18+ years: 3.5-5.0 mmol/L **CL** 0-365 days: 98-113 mmol/L 1-17 years: 102-112 mmol/L 18+ years: 98-108 mmol/L **CO2** 0-2 years: 13-29 mmol/L 3+ years: 21-31 mmol/L **BUN** 7-25 mg/dL **CREA** 0-30 days: 0.50-0.90 mg/dL 31-365 days: 0.40-0.60 mg/dL 1-3 years: 0.40-0.70 mg/dL 4-6 years: 0.50-0.80 mg/dL 7-9 years: 0.50-0.90 mg/dL 10-12 years: 0.60-1.00 mg/dL 13-15 years: 0.70-1.10 mg/dL 16-18 years: 0.80-1.20 mg/dL 19+ years: 0.50-1.20 mg/dL **CA** 0-30 days: 8.4-10.6 mg/dL 31-365 days: 8.9-10.5 mg/dL 1+ years: 8.6-10.5 mg/dL **ANION GAP** 7-17 mmol/L **eGFR** ≥60 mL/min/1.73m2	**NA** 0-6 days: 133-146 mmol/L 7-30 days: 134-144 mmol/L 31-182 days: 134-142 mmol/L 183-365 days: 133-142 mmol/L 1+ years: 135-145 mmol/L **K** 0-7 days: 3.2-5.5 mmol/L 8-30 days: 3.4-6.0 mmol/L 31-182 days: 3.5-5.8 mmol/L 183-365 days: 3.5-6.1 mmol/L 1-17 years: 3.3-4.6 mmol/L 18+ years: 3.5-5.0 mmol/L **CL** 0-365 days: 98-113 mmol/L 1-17 years: 102-112 mmol/L 18+ years: 98-108 mmol/L **CO2** 0-2 years: 13-29 mmol/L 3+ years: 21-31 mmol/L **BUN** 7-25 mg/dL **CREA** 0-30 days: 0.50-1.20 mg/dL 31-365 days: 0.40-0.70 mg/dL 1-3 years: 0.40-0.70 mg/dL 4-6 years: 0.50-0.80 mg/dL 7-9 years: 0.60-0.90 mg/dL 10-12 years: 0.60-1.00 mg/dL 13-15 years: 0.60-1.20 mg/dL 16-18 years: 0.80-1.40 mg/dL 19+ years: 0.70-1.30 mg/dL **CA** 0-30 days: 8.5-10.6 mg/dL 31-365 days: 8.7-10.5 mg/dL 1+ years: 8.6-10.5 mg/dL **ANION GAP** 7-17 mmol/L **eGFR** ≥60 mL/min/1.73m2		**NA/KCL** Indirect ion-selective electrode **CO2** Photometric **BUN** Photometric rate **CREA** Kinetic Jaffe **CA** Photometric, arsenazo **ANION GAP** (Na + K) - (Cl + CO2) **eGFR** eGFRcr = 142 x min(Scr/κ, 1)α x max(Scr/κ, 1)-1.200 x 0.9938Age x 1.012 [if female] Where: κ = 0.7 (females) or 0.9 (males) α = -0.241 (female) or -0.302 (male) Scr = serum creatinine in mg/dL; divide by 88.4 for creatinine in µmol/L Age (years) The "min(Scr/κ, 1)" factor indicates the minimum of Scr/κ or 1.0 and "max(Scr/κ, 1)" indicates the maximum of Scr/κ or 1.0.	See individual analytes	See individual analytes	See individual analytes
BUN	7-25 mg/dL				Photometric rate	Beckman Coulter IFU for serum/verified by OSUWMC Reference Interval Study 2021.	2-130 mg/dL	2-650 mg/dL
BUN CREA	**BUN** 7-25 mg/dL **CREA** 0-30 days: 0.50-0.90 mg/dL 31-365 days: 0.40-0.60 mg/dL 1-3 years: 0.40-0.70 mg/dL 4-6 years: 0.50-0.80 mg/dL 7-9 years: 0.50-0.90 mg/dL 10-12 years: 0.60-1.00 mg/dL 13-15 years: 0.70-1.10 mg/dL 16-18 years: 0.80-1.20 mg/dL 19+ years: 0.50-1.20 mg/dL	**BUN** 7-25 mg/dL **CREA** 0-30 days: 0.50-1.20 mg/dL 31-365 days: 0.40-0.70 mg/dL 1-3 years: 0.40-0.70 mg/dL 4-6 years: 0.50-0.80 mg/dL 7-9 years: 0.60-0.90 mg/dL 10-12 years: 0.60-1.00 mg/dL 13-15 years: 0.60-1.20 mg/dL 16-18 years: 0.80-1.40 mg/dL 19+ years: 0.70-1.30 mg/dL			**BUN** Photometric rate **CREA** Kinetic Jaffe	See individual analytes	See individual analytes	See individual analytes
C Reactive Protein	<10.00 mg/L				Measurement of the rate of decrease in light intensity transmitted (increase in absorbance) through particles suspended in solution is the result of complexes formed during the immunological reaction between the CRP of the patient serum and rabbit anti-CRP-antibodies coated on latex particles.	Clinical Guide to Laboratory Tests, Tietz, 2005; Verified by OSUWMC Reference Interval Study 2021.	0.20-80.00 mg/L	0.20-480.00 mg/L
C Reactive Protein for Cardiac Risk	<2.00 mg/dL				Measurement of the rate of decrease in light intensity transmitted (increase in absorbance) through particles suspended in solution is the result of complexes formed during the immunological reaction between the CRP of the patient serum and rabbit anti-CRP-antibodies coated on latex particles.	Clinical Guide to Laboratory Tests, Tietz, 2005; Verified by OSUWMC Reference Interval Study 2021.	0.20-80.00 mg/L	0.20-480.00 mg/L
C3 Complement	87-200 mg/dL				Turbidimetry	Package Insert. Verified by OSUWMC Reference Interval Study 2021.	15-500 mg/dL	15-1,500 mg/dL
C3, C4	**C3** 87-200 mg/dL **C4** 8-52 mg/dL				Turbidimetry	See individual analytes	See individual analytes	See individual analytes
C4 Complement	8-52 mg/dL				Turbidimetry	Historic Reference Range. Verified by OSUWMC Reference Interval Study 2021.	8-150 mg/dL	8-450 mg/dL
CA 125	≤30 U/mL				Two-site sandwich immunoassay using direct chemiluminometric technology.	Advia Centaur CA 125II Package Insert 128516 Rev. H, 2009-02	3-600 U/mL	3-360,000 U/mL
CA 15-3/N	0.0-32.4 U/mL		0.0-32.4 U/mL (use not defined)		Two-site sandwich immunoassay chemiluminescent.	Atellica IM CA 15-3 Package Insert 11206285_EN Rev. 04, 2020-03	3.0-200.0 U/mL	3.0-200,000.0 U/mL
CA 19-9	≤37.00 U/mL				Two-site sandwich immunoassay using direct chemiluminometric technology.	Clinical Guide to Laboratory Tests, Tietz, 1995; see Source link for additional Reference Range information	15.00-700.00 U/mL	15.00-33,600,000.00 U/mL
Calcium	0-30 days: 8.4-10.6 mg/dL 31-365 days: 8.9-10.5 mg/dL 1+ years: 8.6-10.5 mg/dL		0-30 days: 8.5-10.6 mg/dL 31-365 days: 8.7-10.5 mg/dL 1+ years: 8.6-10.5 mg/dL		Photometric, arsenazo	Established by OSUWMC Reference Interval Study 2013, verified by OSUWMC Reference Interval study 2021.	4.0-18.0 mg/dL	4.0-18.0 mg/dL
Calcium, Urine 24HR	100.0-300.0 mg/24 hrs				Photometric, arsenazo			
Calcium/Creat Ratio, Random Urine	0-209 days: <0.86 Ca mg/Crea mg 210-569 days: <0.60 Ca mg/Crea mg 570 days-2 years: <0.42 Ca mg/Crea mg 3+ years: <0.22 Ca mg/Crea mg				**CALCIUM** Photometric; arsenazo **CREA** Kinetic Jaffe	See individual analytes	See individual analytes	See individual analytes
Carbamazepine Total Level	Therapeutic Range: 4.0-12.0 mcg/mL				Competition between drug in the sample and drug labeled with the enzyme glucose-6-phosphate dehydrogenase (G6PDH) for antibody binding sites. Enzyme activity decreases upon binding to the antibody, so the drug concentration in the sample can be measured in terms of enzyme activity. Active enzyme converts oxidized nicotinamide adenine dinucleotide (NAD) to NADH, resulting in an absorbance change.	Applied Clinical Pharmacokinetics, 2001 Micromedex, OSU Intranet	2.0-20.0 mcg/mL	2.0-100.0 mcg/mL
CEA	≤5.0 ng/mL				Two-site Sandwich Immunoassay Chemiluminescent	Clinical Guide to Laboratory Tests, Tietz, 1995. See source link for additional Reference Range information	2.0-100.0 ng/mL	2.0-8,000,000.0 ng/mL
Ceruloplasmin	20-60 mg/dL				Turbidimetry	Verified by OSUWMC Reference Interval Study 2021.	6-200 mg/dL	6-4,000 mg/dL

Chem 6 (Lytes, BUN, CREA)	**NA** 0-6 days: 133-146 mmol/L 7-30 days: 134-144 mmol/L 31-182 days: 134-142 mmol/L 183-365 days: 133-142 mmol/L 1+ years: 135-145 mmol/L **K** 0-7 days: 3.2-5.5 mmol/L 8-30 days: 3.4-6.0 mmol/L 31-182 days: 3.5-5.6 mmol/L 183-365 days: 3.5-6.1 mmol/L 1-17 years: 3.3-4.6 mmol/L 18+ years: 3.5-5.0 mmol/L **CL** 0-365 days: 98-113 mmol/L 1-17 years: 102-112 mmol/L 18+ years: 98-108 mmol/L **CO2** 0-2 years: 13-29 mmol/L 3+ years: 21-31 mmol/L **BUN** 7-25 mg/dL **CREA** 0-30 days: 0.50-0.90 mg/dL 31-365 days: 0.40-0.60 mg/dL 1-3 years: 0.40-0.70 mg/dL 4-6 years: 0.50-0.80 mg/dL 7-9 years: 0.50-0.90 mg/dL 10-12 years: 0.60-1.00 mg/dL 13-15 years: 0.70-1.10 mg/dL 16-18 years: 0.80-1.20 mg/dL 19+ years: 0.50-1.20 mg/dL **ANION GAP** 7-17 mmol/L **eGFR** ≥60 mL/min/1.73m2	**NA** 0-6 days: 133-146 mmol/L 7-30 days: 134-144 mmol/L 31-182 days: 134-142 mmol/L 183-365 days: 133-142 mmol/L 1+ years: 135-145 mmol/L **K** 0-7 days: 3.2-5.5 mmol/L 8-30 days: 3.4-6.0 mmol/L 31-182 days: 3.5-5.6 mmol/L 183-365 days: 3.5-6.1 mmol/L 1-17 years: 3.3-4.6 mmol/L 18+ years: 3.5-5.0 mmol/L **CL** 0-365 days: 98-113 mmol/L 1-17 years: 102-112 mmol/L 18+ years: 98-108 mmol/L **CO2** 0-2 years: 13-29 mmol/L 3+ years: 21-31 mmol/L **BUN** 7-25 mg/dL **CREA** 0-30 days: 0.50-1.20 mg/dL 31-365 days: 0.40-0.70 mg/dL 1-3 years: 0.40-0.70 mg/dL 4-6 years: 0.50-0.80 mg/dL 7-9 years: 0.60-0.90 mg/dL 10-12 years: 0.60-1.00 mg/dL 13-15 years: 0.60-1.20 mg/dL 16-18 years: 0.80-1.40 mg/dL 19+ years: 0.70-1.30 mg/dL **ANION GAP** 7-17 mmol/L **eGFR** ≥60 mL/min/1.73m2		**NA/KCL** Indirect ion-selective electrode **CO2** Photometric **BUN** Photometric rate **CREA** Kinetic Jaffe **ANION GAP** (Na + K) - (Cl + CO2) **BUN/CREA RATIO** BUN/Creatinine **eGFR** eGFRcr = 142 x min(Scr/κ, 1)α x max(Scr/κ, 1)-1.200 x 0.9938Age x 1.012 [if female] Where κ = 0.7 (females) or 0.9 (males) α = -0.241 (female) or -0.302 (male) Scr = serum creatinine in mg/dL; divide by 88.4 for creatinine in µmol/L Age (years) The "min(Scr/κ, 1)" factor indicates the minimum of Scr/κ or 1.0 and "max(Scr/κ, 1)" indicates the maximum of Scr/κ or 1.0.	See individual analytes	See individual analytes	See individual analytes
Chem 7 (LYTES, BUN, CREA, GLUC)	**NA** 0-6 days: 133-146 mmol/L 7-30 days: 134-144 mmol/L 31-182 days: 134-142 mmol/L 183-365 days: 133-142 mmol/L 1+ years: 135-145 mmol/L **K** 0-7 days: 3.2-5.5 mmol/L 8-30 days: 3.4-6.0 mmol/L 31-182 days: 3.5-5.6 mmol/L 183-365 days: 3.5-6.1 mmol/L 1-17 years: 3.3-4.6 mmol/L 18+ years: 3.5-5.0 mmol/L **CL** 0-365 days: 98-113 mmol/L 1-17 years: 102-112 mmol/L 18+ years: 98-108 mmol/L **CO2** 0-2 years: 13-29 mmol/L 3+ years: 21-31 mmol/L **BUN** 7-25 mg/dL **CREA** 0-30 days: 0.50-0.90 mg/dL 31-365 days: 0.40-0.60 mg/dL 1-3 years: 0.40-0.70 mg/dL 4-6 years: 0.50-0.80 mg/dL 7-9 years: 0.50-0.90 mg/dL 10-12 years: 0.60-1.00 mg/dL 13-15 years: 0.70-1.10 mg/dL 16-18 years: 0.80-1.20 mg/dL 19+ years: 0.50-1.20 mg/dL **GLUC** 0-30 days: 55-115 mg/dL 31-182 days: 57-117 mg/dL 183-365 days: 70-126 mg/dL Fasting 1+ years: 70-99 mg/dL Nonfasting 1+years: 70-179 mg/dL **ANION GAP** 7-17 mmol/L **OSMO (CALC)** 278-305 mOsm/kg **eGFR** ≥60 mL/min/1.73m2	**NA** 0-6 days: 133-146 mmol/L 7-30 days: 134-144 mmol/L 31-182 days: 134-142 mmol/L 183-365 days: 133-142 mmol/L 1+ years: 135-145 mmol/L **K** 0-7 days: 3.2-5.5 mmol/L 8-30 days: 3.4-6.0 mmol/L 31-182 days: 3.5-5.6 mmol/L 183-365 days: 3.5-6.1 mmol/L 1-17 years: 3.3-4.6 mmol/L 18+ years: 3.5-5.0 mmol/L **CL** 0-365 days: 98-113 mmol/L 1-17 years: 102-112 mmol/L 18+ years: 98-108 mmol/L **CO2** 0-2 years: 13-29 mmol/L 3+ years: 21-31 mmol/L **BUN** 7-25 mg/dL **CREA** 0-30 days: 0.50-1.20 mg/dL 31-365 days: 0.40-0.70 mg/dL 1-3 years: 0.40-0.70 mg/dL 4-6 years: 0.50-0.80 mg/dL 7-9 years: 0.60-0.90 mg/dL 10-12 years: 0.60-1.00 mg/dL 13-15 years: 0.60-1.20 mg/dL 16-18 years: 0.80-1.40 mg/dL 19+ years: 0.70-1.30 mg/dL **GLUC** 0-30 days: 55-115 mg/dL 31-182 days: 57-117 mg/dL 183-365 days: 70-126 mg/dL Fasting 1+ years: 70-99 mg/dL Nonfasting 1+years: 70-179 mg/dL **ANION GAP** 7-17 mmol/L **OSMO (CALC)** 278-305 mOsm/kg **eGFR** ≥60 mL/min/1.73m2		**NA/KCL** Indirect ion-selective electrode **CO2** Photometric **BUN** Photometric rate **CREA** Kinetic Jaffe **GLUC** Photometric rate with hexokinase **BUN/CREA RATIO** BUN/Creatinine **eGFR** eGFRcr = 142 x min(Scr/κ, 1)α x max(Scr/κ, 1)-1.200 x 0.9938Age x 1.012 [if female] Where κ = 0.7 (females) or 0.9 (males) α = -0.241 (female) or -0.302 (male) Scr = serum creatinine in mg/dL; divide by 88.4 for creatinine in µmol/L Age (years) The "min(Scr/κ, 1)" factor indicates the minimum of Scr/κ or 1.0 and "max(Scr/κ, 1)" indicates the maximum of Scr/κ or 1.0.	See individual analytes	See individual analytes	See individual analytes
Chloride	0-365 days: 98-113 mmol/L 1-17 years: 102-112 mmol/L 18+ years: 98-108 mmol/L			Indirect ion-selective electrode	Established by OSUWMC Reference Interval Study 2013, verified by OSUWMC Reference Interval study 2021.	50-200 mmol/L	50-200 mmol/L
Chloride, 24 HR Urine	110-250 mmol/24 hrs			Indirect ion-selective electrode	Clinical Guide to Laboratory Tests. Tietz. 1995		
Chloride, Random Urine			The reference range has not been established for random urine specimens. The test result should be integrated into the clinical context for interpretation.	Indirect ion-selective electrode		15-400 mmol/L	15-400 mmol/L
Cholesterol, Body Fluid			**Pleural:** Pleural fluid cholesterol concentrations > 200 mg/dL are associated with pseudochylous effusions. **Peritoneal:** Peritoneal fluid cholesterol concentrations greater than 32-70 mg/dL may suggest malignant ascites.	Enzymatic colorimetric	Pleural: Hooper C, et al. Thorax. 2010 Aug;65:Suppl2:ii4-17. McGrath, et al. Int J Clin Pract. 2009 Nov;63(11):1653-9. Peritoneal: Block, et al. Crit Rev Clin Lab Sci. 2013;50:107-124.	25-700 mg/dL	25-700 mg/dL
Cholesterol Total	0-30 days: 62-155 mg/dL 31-182 days: 62-141 mg/dL 183-365 days: 76-216 mg/dL 1-3 years: 108-193 mg/dL 4-6 years: 106-193 mg/dL 7-9 years: 104-210 mg/dL 10-12 years: 105-218 mg/dL 13-15 years: 108-205 mg/dL 16-18 years: 92-234 mg/dL 19+ years: <200 mg/dL	0-30 days: 54-151 mg/dL 31-182 days: 81-147mg/dL 183-365 days: 76-179 mg/dL 1-3 years: 85-182 mg/dL 4-6 years: 110-217 mg/dL 7-9 years: 110-211 mg/dL 10-12 years: 105-223 mg/dL 13-15 years: 91-204 mg/dL 16-18 years: 82-192 mg/dL 19+ years: <200 mg/dL		Enzymatic colorimetric	National Cholesterol Education Project (NCEP) Adult Treatment Protocol (ATP- III) (Circulation, 2002;106:3143-3421)	25-700 mg/dL	25-2,100 mg/dL
Cholesterol/Triglyceride	**CHOL** 0-30 days: 62-155 mg/dL 31-182 days: 62-141 mg/dL 183-365 days: 76-216 mg/dL 1-3 years: 108-193 mg/dL 4-6 years: 106-193 mg/dL 7-9 years: 104-210 mg/dL 10-12 years: 105-218 mg/dL 13-15 years: 108-205 mg/dL 16-18 years: 92-234 mg/dL 19+ years: <200 mg/dL **TRIG** 0-3 years: 27-125 mg/dL 4-6 years: 32-116 mg/dL 7-9 years: 28-129 mg/dL 10-11 years: 39-140 mg/dL 12-13 years: 37-130 mg/dL 14-15 years: 38-135 mg/dL 16-19 years: 37-140 mg/dL 20+ years: <150 mg/dL	**CHOL** 0-30 days: 54-151 mg/dL 31-182 days: 81-147mg/dL 183-365 days: 76-179 mg/dL 1-3 years: 85-182 mg/dL 4-6 years: 110-217 mg/dL 7-9 years: 110-211 mg/dL 10-12 years: 105-223 mg/dL 13-15 years: 91-204 mg/dL 16-18 years: 82-192 mg/dL 19+ years: <200 mg/dL **TRIG** 0-3 years: 27-125 mg/dL 4-6 years: 32-116 mg/dL 7-9 years: 28-129 mg/dL 10-11 years: 24-137 mg/dL 12-13 years: 24-145 mg/dL 14-15 years: 34-165 mg/dL 16-19 years: 34-140 mg/dL 20+ years: <150 mg/dL		Enzymatic colorimetric	See individual analytes	See individual analytes	See individual analytes

CK	0-30 days: 2-134 U/L 31-182 days: 2-146 U/L 183-365 days: 18-138 U/L 1-3 years: 2-134 U/L 4-6 years: 8-147 U/L 7-9 years: 26-145 U/L 10-12 years: 6-137 U/L 13-15 years: 2-143 U/L 16-18 years: 13-144 U/L 19+ years: 30-184 U/L	0-30 days: 2-183 U/L 31-182 days: 2-129 U/L 183-365 days: 2-143 U/L 1-3 years: 2-183 U/L 4-6 years: 18-158 U/L 7-9 years: 2-177 U/L 10-12 years: 6-217 U/L 13-15 years: 2-251 U/L 16-18 years: 2-238 U/L 19+ years: 30-220 U/L		Photometric rate	Established by OSUWMC Reference Interval Study 2013, verified by OSUWMC Reference Interval study 2021.	10-2,000 U/L	10-200,000 U/L
Clozapine Level	350-1,000 ng/mL			Turbidimetric immunoassay.	Established by OSUWMC Reference Interval Study 2023.		68-1,500 ng/mL
CMPN without Glucose	**NA** 0-6 days: 133-146 mmol/L 7-30 days: 134-144 mmol/L 31-182 days: 134-142 mmol/L 183-365 days: 133-142 mmol/L 1+ years: 135-145 mmol/L **K** 0-7 days: 3.2-5.5 mmol/L 8-30 days: 3.4-6.0 mmol/L 31-182 days: 3.5-5.6 mmol/L 183-365 days: 3.5-6.1 mmol/L 1-17 years: 3.3-4.6 mmol/L 18+ years: 3.5-5.0 mmol/L **CL** 0-365 days: 98-113 mmol/L 1-17 years: 102-112 mmol/L 18+ years: 98-108 mmol/L **CO2** 0-2 years: 13-29 mmol/L 3+ years: 21-31 mmol/L **BUN** 7-25 mg/dL **CREA** 0-30 days: 0.50-0.90 mg/dL 31-365 days: 0.40-0.60 mg/dL 1-3 years: 0.40-0.70 mg/dL 4-6 years: 0.50-0.80 mg/dL 7-9 years: 0.50-0.90 mg/dL 10-12 years: 0.60-1.00 mg/dL 13-15 years: 0.70-1.10 mg/dL 16-18 years: 0.80-1.20 mg/dL 19+ years: 0.50-1.20 mg/dL **CA** 0-30 days: 8.4-10.6 mg/dL 31-365 days: 8.9-10.5 mg/dL 1+ years: 8.6-10.5 mg/dL **ANION GAP** 7-17 mmol/L **eGFR** ≥60 mL/min/1.73m2 **ALB** 0-30 days: 2.7-4.3 g/dL 31-182 days: 2.9-4.2 g/dL 183-365 days: 3.3-4.8 g/dL 1-19 years: 2.9-4.2 g/dL 19+ years: 3.5-5.0 g/dL **TBIL** 0-1 day: 1.4-8.7 mg/dL 1-2 days: 3.4-11.5 mg/dL 3-4 days: 1.5-12.0 mg/dL 5-365 days: 0.3-1.2 mg/dL 1+ years: <1.5 mg/dL **ALP** 0-30 days: 48-406 U/L 31-365 days: 124-341 U/L 1-3 years: 108-317 U/L 4-6 years: 96-297 U/L 7-9 years: 69-325 U/L 10-12 years: 51-322 U/L 13-15 years: 50-162 U/L 16-18 years: 47-119 U/L 19+ years: 32-126 U/L **ALT** 0-30 days: 8-25 U/L 31 days-4 years: 8-30 U/L 4-6 years: 8-25 U/L 7-9 years: 8-25 U/L 10-17 years: 8-20 U/L 18+ years: 9-48 U/L **AST** 0-30 days: 0-40 U/L 31-365 days: 0-80 U/L 1-3 years: 0-70 U/L 4-6 years: 0-60 U/L 7-9 years: 0-42 U/L 10-12 years: 0-38 U/L 13-15 years: 0-33 U/L 16-18 years: 0-31 U/L 19+ years: 10-39 U/L **TP** 0-30 days: 4.2-6.2 g/dL 31-182 days: 4.4-6.8 g/dL 183-365 days: 5.6-7.0 g/dL 1-18 years: 5.7-8.0 g/dL 19+ years: 6.4-8.3 g/dL	**NA** 0-6 days: 133-146 mmol/L 7-30 days: 134-144 mmol/L 31-182 days: 134-142 mmol/L 183-365 days: 133-142 mmol/L 1+ years: 135-145 mmol/L **K** 0-7 days: 3.2-5.5 mmol/L 8-30 days: 3.4-6.0 mmol/L 31-182 days: 3.5-5.6 mmol/L 183-365 days: 3.5-6.1 mmol/L 1-17 years: 3.3-4.6 mmol/L 18+ years: 3.5-5.0 mmol/L **CL** 0-365 days: 98-113 mmol/L 1-17 years: 102-112 mmol/L 18+ years: 98-108 mmol/L **CO2** 0-2 years: 13-29 mmol/L 3+ years: 21-31 mmol/L **BUN** 7-25 mg/dL **CREA** 0-30 days: 0.50-1.20 mg/dL 31-365 days: 0.40-0.70 mg/dL 1-3 years: 0.40-0.70 mg/dL 4-6 years: 0.50-0.80 mg/dL 7-9 years: 0.60-0.90 mg/dL 10-12 years: 0.60-1.00 mg/dL 13-15 years: 0.60-1.20 mg/dL 16-18 years: 0.80-1.40 mg/dL 19+ years: 0.70-1.30 mg/dL **CA** 0-30 days: 8.5-10.6 mg/dL 31-365 days: 8.7-10.5 mg/dL 1+ years: 8.6-10.5 mg/dL **ANION GAP** 7-17 mmol/L **eGFR** 0-4 days: 1.000-39.000 uIU/mL **ALB** 0-30 days: 2.6-4.1 g/dL 31-182 days: 2.8-4.6 g/dL 183-365 days: 2.8-4.8 g/dL 1-19 years: 3.2-4.7 g/dL 19+ years: 3.5-5.0 g/dL **TBIL** 0-1 day: 1.4-8.7 mg/dL 1-2 days: 3.4-11.5 mg/dL 3-4 days: 1.5-12.0 mg/dL 5-365 days: 0.3-1.2 mg/dL 1+ years: <1.5 mg/dL **ALP** 0-30 days: 75-316 U/L 31-365 days: 82-383 U/L 1-3 years: 104-345 U/L 4-6 years: 93-309 U/L 7-9 years: 86-315 U/L 10-12 years: 42-362 U/L 13-15 years: 74-390 U/L 16-18 years: 52-171 U/L 19+ years: 32-126 U/L **ALT** 0-30 days: 8-25 U/L 31-365 days: 8-35 U/L 1-3 years: 8-30 U/L 4-6 years: 8-20 U/L 7-9 years: 8-25 U/L 10-17 years: 8-30 U/L 18+ years: 10-52 U/L **AST** 0-30 days: 0-52 U/L 31-365 days: 0-66 U/L 1-3 years: 0-57 U/L 4-6 years: 0-49 U/L 7-9 years: 0-43 U/L 10-12 years: 0-39 U/L 13-15 years: 0-40 U/L 16-18 years: 0-40 U/L 19+ years: 10-39 U/L **TP** 0-30 days: 4.1-6.3 g/dL 31-182 days: 4.7-6.7 g/dL 183-365 days: 5.5-7.0 g/dL 1-18 years: 5.7-8.0 g/dL 19+ years: 6.4-8.3 g/dL	**NA/KCL** Indirect ion-selective electrode **CO2** Photometric **BUN** Photometric rate **CREA** Kinetic Jaffe **CA** Photometric, arsenazo **ANION GAP** (Na + K) - (Cl + CO2) **eGFR** eGFRcr = 142 x min(Scr/κ, 1)α x max(Scr/κ, 1)-1.200 x 0.9938Age x 1.012 [if female] Where κ = 0.7 (females) or 0.9 (males) α = -0.241 (female) or -0.302 (male) Scr = serum creatinine in mg/dL; divide by 88.4 for creatinine in μmol/L Age (years) The "min(Scr/κ, 1)" factor indicates the minimum of Scr/κ or 1.0 and "max(Scr/κ, 1)" indicates the maximum of Scr/κ or 1.0. **TBIL** Photometric with 3,5-dichlorophenyldiazonium tetrafluoroborate (DPD), and caffeine and a surfactant as accelerators. **ALP** Photometric rate with p-nitro-phenylphosphate (pNPP) in the presence of 2-amino-2-methyl-1-propanol (AMP) at pH 10.4. **ALT** Photometric rate with alanine to α-oxoglutarate to form pyruvate and glutamate. This assay does not contain pyridoxyl-5-phosphate. **AST** Photometric rate with aspartate and α-oxoglutarate to form pyruvate and glutamate. This assay does not contain pyridoxyl-5-phosphate. **TP** Colorimetric with cupric ions in an alkaline solution.	See individual analytes	See individual analytes	See individual analytes
CO2 Total	0-2 years: 13-29 mmol/L			Photometric	Beckman Coulter IFU verified by OSUWMC Reference Interval Study 2021.	5-45 mmol/L	5-45 mmol/L
	NA 0-6 days: 133-146 mmol/L 7-30 days: 134-144 mmol/L 31-182 days: 134-142 mmol/L 183-365 days: 133-142 mmol/L 1+ years: 135-145 mmol/L **K** 0-7 days: 3.2-5.5 mmol/L 8-30 days: 3.4-6.0 mmol/L 31-182 days: 3.5-5.6 mmol/L 183-365 days: 3.5-6.1 mmol/L 1-17 years: 3.3-4.6 mmol/L 18+ years: 3.5-5.0 mmol/L **CL** 0-365 days: 98-113 mmol/L 1-17 years: 102-112 mmol/L 18+ years: 98-108 mmol/L **CO2** 0-2 years: 13-29 mmol/L	**NA** 0-6 days: 133-146 mmol/L 7-30 days: 134-144 mmol/L 31-182 days: 134-142 mmol/L 183-365 days: 133-142 mmol/L 1+ years: 135-145 mmol/L **K** 0-7 days: 3.2-5.5 mmol/L 8-30 days: 3.4-6.0 mmol/L 31-182 days: 3.5-5.6 mmol/L 183-365 days: 3.5-6.1 mmol/L 1-17 years: 3.3-4.6 mmol/L 18+ years: 3.5-5.0 mmol/L **CL** 0-365 days: 98-113 mmol/L 1-17 years: 102-112 mmol/L 18+ years: 98-108 mmol/L **CO2** 0-2 years: 13-29 mmol/L 3+ years: 21-31 mmol/L					

Comprehensive Metabolic Panel	1+ years: 21-31 mmol/L **GLUC** 0-30 days: 55-115 mg/dL 31-182 days: 57-117 mg/dL 183-365 days: 70-126 mg/dL Fasting 1+ years: 70-99 mg/dL Nonfasting 1+years: 70-179 mg/dL **BUN** 7-25 mg/dL **CREA** 0-30 days: 0.50-0.90 mg/dL 31-365 days: 0.40-0.60 mg/dL 1-3 years: 0.40-0.70 mg/dL 4-6 years: 0.50-0.80 mg/dL 7-9 years: 0.50-0.90 mg/dL 10-12 years: 0.60-1.00 mg/dL 13-15 years: 0.70-1.10 mg/dL 16-18 years: 0.80-1.20 mg/dL 19+ years: 0.50-1.20 mg/dL **CA** 0-30 days: 8.4-10.6 mg/dL 31-365 days: 8.9-10.5 mg/dL 1+ years: 8.6-10.5 mg/dL **OSMO** 278-305 mOsm/kg **ANION GAP** 7-17 mmol/L **eGFR** ≥60 mL/min/1.73m2 **ALB** 0-30 days: 2.7-4.3 g/dL 31-182 days: 2.9-4.2 g/dL 183-365 days: 3.3-4.8 g/dL 1-19 years: 2.9-4.2 g/dL 19+ years: 3.5-5.0 g/dL **TBIL** 0-1 day: 1.4-8.7 mg/dL 1-2 days: 3.4-11.5 mg/dL 3-4 days: 1.5-12.0 mg/dL 5-365 days: 0.3-1.2 mg/dL 1+ years: <1.5 mg/dL **ALP** 0-30 days: 48-406 U/L 31-365 days: 124-341 U/L 1-3 years: 108-317 U/L 4-6 years: 96-297 U/L 7-9 years: 69-325 U/L 10-12 years: 51-332 U/L 13-15 years: 50-162 U/L 16-18 years: 47-119 U/L 19+ years: 32-126 U/L **ALT** 0-30 days: 8-25 U/L 31 days-4 years: 8-30 U/L 4-6 years: 8-25 U/L 7-9 years: 8-23 U/L 10-17 years: 8-20 U/L 18+ years: 9-48 U/L **AST** 0-30 days: 0-49 U/L 31-365 days: 0-80 U/L 1-3 years: 0-70 U/L 4-6 years: 0-60 U/L 7-9 years: 0-42 U/L 10-12 years: 0-38 U/L 13-15 years: 0-33 U/L 16-18 years: 0-31 U/L 19+ years: 10-39 U/L **TP** 0-30 days: 4.2-6.2 g/dL 31-182 days: 4.4-6.6 g/dL 183-365 days: 5.6-7.9 g/dL 1-18 years: 5.7-8.0 g/dL 19+ years: 6.4-8.3 g/dL	 **GLUC** 0-30 days: 55-115 mg/dL 31-182 days: 57-117 mg/dL 183-365 days: 70-126 mg/dL Fasting 1+ years: 70-99 mg/dL Nonfasting 1+years: 70-179 mg/dL **BUN** 7-25 mg/dL **CREA** 0-30 days: 0.50-1.20 mg/dL 31-365 days: 0.40-0.70 mg/dL 1-3 years: 0.40-0.70 mg/dL 4-6 years: 0.50-0.80 mg/dL 7-9 years: 0.60-0.90 mg/dL 10-12 years: 0.60-1.00 mg/dL 13-15 years: 0.60-1.20 mg/dL 16-18 years: 0.80-1.40 mg/dL 19+ years: 0.70-1.30 mg/dL **CA** 0-30 days: 8.5-10.6 mg/dL 31-365 days: 8.7-10.5 mg/dL 1+ years: 8.6-10.5 mg/dL **OSMO** 278-305 mOsm/kg **ANION GAP** 7-17 mmol/L **eGFR** 0-4 days: 1.000-39.000 uL/l/mL **ALB** 0-30 days: 2.6-4.1 g/dL 31-182 days: 2.8-4.6 g/dL 183-365 days: 2.8-4.8 g/dL 1-19 years: 3.2-4.7 g/dL 19+ years: 3.5-5.0 g/dL **TBIL** 0-1 day: 1.4-8.7 mg/dL 1-2 days: 3.4-11.5 mg/dL 3-4 days: 1.5-12.0 mg/dL 5-365 days: 0.3-1.2 mg/dL 1+ years: <1.5 mg/dL **ALP** 0-30 days: 75-316 U/L 31-365 days: 82-383 U/L 1-3 years: 104-345 U/L 4-6 years: 93-309 U/L 7-9 years: 86-315 U/L 10-12 years: 42-362 U/L 13-15 years: 74-390 U/L 16-18 years: 52-171 U/L 19+ years: 32-126 U/L **ALT** 0-30 days: 8-25 U/L 31-365 days: 8-35 U/L 1-3 years: 8-30 U/L 4-6 years: 8-20 U/L 7-9 years: 8-25 U/L 10-17 years: 8-30 U/L 18+ years: 10-52 U/L **AST** 0-30 days: 0-52 U/L 31-365 days: 0-66 U/L 1-3 years: 0-57 U/L 4-6 years: 0-49 U/L 7-9 years: 0-43 U/L 10-12 years: 0-39 U/L 13-15 years: 0-40 U/L 16-18 years: 0-40 U/L 19+ years: 10-39 U/L **TP** 0-30 days: 4.1-6.3 g/dL 31-182 days: 4.7-6.7 g/dL 183-365 days: 5.5-7.0 g/dL 1-18 years: 5.7-8.0 g/dL 19+ years: 6.4-8.3 g/dL		**NA/K/CL** Indirect ion-selective electrode **CO2** Photometric **GLUC** Photometric rate with hexokinase **BUN** Photometric rate **CREA** Kinetic Jaffe **CA** Photometric, arsenazo **ANION GAP** (Na + K) - (Cl + CO2) **eGFR** eGFRcr = 142 x min(Scr/κ, 1)α x max(Scr/κ, 1)-1.200 x 0.9938Age x 1.012 [if female] Where κ = 0.7 (females) or 0.9 (males) α = -0.241 (female) or -0.302 (male) Scr = serum creatinine in mg/dL; divide by 88.4 for creatinine in µmol/L Age (years) The "min(Scr/κ, 1)" factor indicates the minimum of Scr/κ or 1.0 and "max(Scr/κ, 1)" indicates the maximum of Scr/κ or 1.0. **OSMO CALC** (1.86 (Na +K) + 1.15 (Glucose/18) + (Urea/2.8) + 14 where Na and K are in mmol/L; Glucose and Urea are in mg/dL. **TBIL** Photometric with 3,5 -dichlorophenyldiazonium tetrafluoroborate (DPD), and caffeine and a surfactant as accelerators. **ALP** Photometric rate with p-nitro-phenylphosphate (pNPP) in the presence of 2-amino- 2-methyl-1-propanol (AMP) at pH 10.4. **ALT** Photometric rate with alanine to α-oxoglutarate to form pyruvate and glutamate. This assay does not contain pyridoxyl-5-phosphate. **AST** Photometric rate with aspartate and α-oxoglutarate to form pyruvate and glutamate. This assay does not contain pyridoxyl-5-phosphate. **TP** Colorimetric with cupric ions in an alkaline solution.	See individual analytes	See individual analytes	See individual analytes
Cortisol	3.09-22.40 mcg/dL			Competitive immunoassay using direct chemiluminescent technology.	Atellica IM Cortisol Package Insert 11200393_EN Rev. 03-2020-03	0.50-75.00 mcg/dL	0.50-2,400.00 mcg/dL
Cortisol (DST) Overnight	<1.80 mcg/dL			Competitive immunoassay using direct chemiluminescent technology.	Atellica IM Cortisol Package Insert 11200393_EN Rev. 03-2020-04	0.50-75.00 mcg/dL	0.50-2,400.00 mcg/dL
Cortisol, Baseline	3.09-22.40 mcg/dL			Competitive immunoassay using direct chemiluminescent technology.	Atellica IM Cortisol Package Insert 11200393_EN Rev. 03-2020-05	0.50-75.00 mcg/dL	0.50-2,400.00 mcg/dL
Cortisol, 30 Minute	≥18.00 mcg/dL			Competitive immunoassay using direct chemiluminescent technology.	Atellica IM Cortisol Package Insert 11200393_EN Rev. 03-2020-06	0.50-75.00 mcg/dL	0.50-2,400.00 mcg/dL
Cortisol, 60 Minute	≥18.00 mcg/dL			Competitive immunoassay using direct chemiluminescent technology.	Atellica IM Cortisol Package Insert 11200393_EN Rev. 03-2020-07	0.50-75.00 mcg/dL	0.50-2,400.00 mcg/dL
Creatinine Body Fluid			**Peritoneal and drainage:** Fluid creatinine concentrations that are greater than serum/plasma creatinine concentrations may imply intraperitoneal leakage of urine outside of the urinary tract. **Pleural**: Pleural fluid creatinine to serum/plasma creatinine concentration ratio > 1 suggests urinothorax.	**CREA** Kinetic Jaffe **eGFR** eGFRcr = 142 x min(Scr/κ, 1)α x max(Scr/κ, 1)-1.200 x 0.9938Age x 1.012 [if female] Where κ = 0.7 (females) or 0.9 (males) α = -0.241 (female) or -0.302 (male) Scr = serum creatinine in mg/dL; divide by 88.4 for creatinine in µmol/L Age (years) The "min(Scr/κ, 1)" factor indicates the minimum of Scr/κ or 1.0 and "max(Scr/κ, 1)" indicates the maximum of Scr/κ or 1.0.	Manahan KJ, et al. Obstet Gynecol. 1999 May;93(5 Pt 1):780-2 Pleural: Toubas, et al. J Thorac Dis. 2017;9(5):1209.1218.	0.20-25.00 mg/dL	0.20-25.00 mg/dL
Creatinine	**CREA** 0-30 days: 0.50-0.90 mg/dL 31-365 days: 0.40-0.60 mg/dL 1-3 years: 0.40-0.70 mg/dL 4-6 years: 0.50-0.80 mg/dL 7-9 years: 0.50-0.90 mg/dL 10-12 years: 0.60-1.00 mg/dL 13-15 years: 0.70-1.10 mg/dL 16-18 years: 0.80-1.20 mg/dL 19+ years: 0.50-1.20 mg/dL **eGFR** ≥60 mL/min/1.73m2	**CREA** 0-30 days: 0.50-1.20 mg/dL 31-365 days: 0.40-0.70 mg/dL 1-3 years: 0.40-0.70 mg/dL 4-6 years: 0.50-0.80 mg/dL 7-9 years: 0.60-0.90 mg/dL 10-12 years: 0.60-1.00 mg/dL 13-15 years: 0.60-1.20 mg/dL 16-18 years: 0.80-1.40 mg/dL 19+ years: 0.70-1.30 mg/dL **eGFR** ≥60 mL/min/1.73m2		Kinetic Jaffe	OSUWMC Reference Range Study effective 12.11.2013; verified by OSUWMC Reference Interval Study 2021. Pediatric Reference Ranges, Soldin, 1999.	CREA: 0.20-25.00 mg/dL eGFR: ≤90 mL/min/1.73m2	CREA: 0.20-25.00 mg/dL eGFR: ≤90 mL/min/1.73m2
Creatinine, 8 HR Urine				Kinetic Jaffe		1.00-300.00 mg/dL	1.00-900.00 mg/dL
Creatinine, 24 HR Urine	0-2 years: 0.70-2.00 g/24 hrs 3-8 years: 0.11-0.68 g/24 hrs 9-12 years: 0.17-1.41 g/24 hrs 13-17 years: 0.29-1.87 g/24 hrs 18+ years: 0.60-1.80 g/24 hrs	0-2 years: 0.70-2.00 g/24 hrs 3-8 years: 0.11-0.68 g/24 hrs 9-12 years: 0.17-1.41 g/24 hrs 13-17 years: 0.29-1.87 g/24 hrs 18+ years: 0.80-2.00 g/24 hrs		Kinetic Jaffe	NKDEP traceable :Clinical Guide to Laboratory Tests, Tietz, 1995; Pediatric Reference Ranges, Soldin, 1999		
Creatinine, Random Urine			The reference range has not been established for random urine specimens. The test result should be integrated into the clinical context for interpretation.	Kinetic Jaffe		1.00-300.00 mg/dL	1.00-900.00 mg/dL

Cystatin C and Creatinine with estimated GFR	**CYSC** 0.51-1.05 mg/L **CREA** 0-30 days: 0.50-0.90 mg/dL 31-365 days: 0.40-0.60 mg/dL 1-3 years: 0.40-0.70 mg/dL 4-6 years: 0.50-0.80 mg/dL 7-9 years: 0.50-0.90 mg/dL 10-12 years: 0.60-1.00 mg/dL 13-15 years: 0.70-1.10 mg/dL 16-18 years: 0.80-1.20 mg/dL 19+ years: 0.50-1.20 mg/dL **eGFR** ≥60 mL/min/1.73m2	**CYSC** 0.51-1.05 mg/L **CREA** 0-30 days: 0.50-1.20 mg/dL 31-365 days: 0.40-0.70 mg/dL 1-3 years: 0.40-0.70 mg/dL 4-6 years: 0.50-0.80 mg/dL 7-9 years: 0.60-0.90 mg/dL 10-12 years: 0.60-1.00 mg/dL 13-15 years: 0.60-1.20 mg/dL 16-18 years: 0.80-1.40 mg/dL 19+ years: 0.70-1.30 mg/dL **eGFR** ≥60 mL/min/1.73m2		**CYSC** Turbidometric **CREA** Kinetic Jaffe CKD-EPI 2021 Calculation. eGFRcr-cyn = 135 x min(Scr/κ, 1)α x max(Scr/κ, 1)-0.544 x min(Scys/0.8, 1)-0.323 x max(Scys/0.8, 1)-0.778 x 0.9961 x Age x 0.963 [if female] where κ = 0.7 (females) or 0.9 (males) α = -0.219 (female) or -0.144 (male) Scr = serum creatinine in mg/dL Scys = serum cystatin C in mg/L Age (years) The "min (Scr/κ, 1)" factor indicates the minimum of Scr/κ or 1.0, "max(Scr/κ, 1)" indicates the maximum of Scr/κ or 1.0, "max(Scys/0.8, 1)" indicates the minimum of Scys/0.8 or 1.0, and "max(Scys/0.8, 1)" indicates the maximum of Scys/0.8 or 1.0.		CREA: 0.20-25.00 mg/dL CYSC: 0.40-8.00 mg/L	CREA: 0.20-25.00 mg/dL CYSC: 0.40-32.00 mg/L
Digoxin Level	Therapeutic Range: 0.5-1.0 ng/mL			Enzyme Immunoassay	Applied Clinical Pharmacokinetics, Bauer, 2001	0.3-5.0 ng/mL	0.3-10.0 ng/mL
Estradiol, Enhanced			**Male:** 19+ years: <11.8-39.8 **Menstruating Females:** Follicular phase: 19.5-144.2 Midcycle peak: 63.9-356.7 Luteal phase: 55.8-214.2 **Post-menopausal:** <11.8-32.2 This test is not recommended for patients receiving Fulvestrant (Faslodex) due to possible false elevations. EE2 levels vary widely throughout the menstrual cycle.	Competitive assay format. The endogenous estradiol contained in a sample is released from its binding proteins by a releasing agent. Then, a sheep monoclonal anti-estradiol antibody labeled with an acridinium ester is added to bind available estradiol. Finally, an estradiol derivative capture solid phase is added to the reaction to compete with estradiol for the binding of the acridinium-labeled antibody. After washing, acid and base are dispensed to initiate the chemiluminescent reaction.	Advia Centaur, Enhanced Estradiol (eE2) Package Insert 10491467 Rev. C, 2010-09; Pediatric Reference Ranges, Soldin, 1999	11.8-3,000.0 pg/mL	11.8-150,000.0 pg/mL
EUS Pancreatic Lab (Fluid CEA, AMY)			**CEA:** Fluid CEA values >192 ng/mL may indicate mucinous cystic lesions of the pancreas. Results <192 ng/mL require clinical correlations with patient history and other imaging modalities. This chemiluminescent test was developed and its performance characteristics determined by the Critical Care Laboratory at The Ohio State University Wexner Medical Center. It has not been cleared or approved by the FDA. The laboratory is regulated under CLIA as qualified to perform high-complexity testing. This test is used for clinical purposes. It should not be regarded as investigational or for research. **AMY:** Very low pancreatic cyst fluid amylase concentrations (< 250 U/L) exclude a pseudocyst in the majority of cases.	**AMY** Photometric rate **CEA** Two-site Sandwich Immunoassay Chemiluminescent	See individual analytes	See individual analytes	See individual analytes
Ferritin	0-365 days: 5.7-421.0 ng/mL 1-12 years: 12.8-88.7 ng/mL 13-18 years: 6.8-75.6 ng/mL 19+ years: 7.3-270.7 ng/mL	0-365 days: 5.7-421.0 ng/mL 1-12 years: 12.8-88.7 ng/mL 13-18 years: 10.9-135.0 ng/mL 19+ years: 10.5-307.3 ng/mL		Two-site Sandwich Immunoassay Chemiluminescent.	Siemens Atellica IM Reference Interval Verification Study 2023 Siemens Atellica IM Reference Interval Verification Study Summary (Amendment)	0.9-1,650.0 ng/mL	0.9-1,650,000.0 ng/mL
Folate, Serum	0-1 years: 6.30-22.70 ng/mL 2-3 years: 1.70-15.70 ng/mL 4-6 years: 2.70-14.10 ng/mL 7-9 years: 2.40-13.40 ng/mL 10-12 years: 1.00-10.20 ng/mL 13-18 years: 1.20-7.20 ng/mL 19+ years: >5.38 ng/mL	0-1 years: 7.20-22.40 ng/mL 2-3 years: 2.50-15.00 ng/mL 4-6 years: 0.50-13.00 ng/mL 7-9 years: 2.30-11.90 ng/mL 10-12 years: 1.50-10.80 ng/mL 13-18 years: 1.20-8.80 ng/mL 19+ years: >5.38 ng/mL		Competitive immunoassay using direct chemiluminescent technology.	Atellica IM Folate Package Insert 11200602 EN Rev. 04-2020-11; Pediatric Reference Ranges, Soldin, 1999	0.56-24.00 ng/mL	0.56-960.00 ng/mL
FSH	0-365 days: 1.9-22.9 mIU/mL 1-8 years: 1.1-9.5 mIU/mL 9-11 years: 1.2-9.2 mIU/mL 12-18 years: 1.9-11.2 mIU/mL	0-365 days: 0.8-5.2 mIU/mL 1-8 years: 0.8-2.5 mIU/mL 9-11 years: 1.0-4.2 mIU/mL 12-18 years: 2.3-10.2 mIU/mL	10+ Male: <18.1 mIU/mL 10+ years Female: Follicular: 2.5-10.2 mIU/mL Midcycle: 3.4-33.4 mIU/mL Luteal: 1.5-9.1 mIU/mL Pregnant: <0.3 mIU/mL Post Menopausal: 23.0-116.3 mIU/mL	Two-site sandwich immunoassay using direct chemiluminometric technology.	Atellica IM FSH Package Insert 11200384_EN Rev. 06-2020-09	0.3-200.0 mIU/mL	0.3-6,400.0 mIU/mL
GGT	0-182 days: 15-132 U/L 183-365 days: 8-39 U/L 1-12 years: 8-23 U/L 13-18 years: 8-24 U/L 19+ years: 8-64 U/L	0-182 days: 12-122 U/L 183-365 days: 8-39 U/L 1-12 years: 8-22 U/L 13-18 years: 8-42 U/L 19+ years: 8-64 U/L		Photometric rate	Beckman Coulter IFU verified by OSUWMC Reference Interval Study 2021 (lower end modified). Pediatric Reference Ranges, Soldin, 1999 (Lower end of reference range modified to agree with the linear limits).	3-1,200 U/L	3-6,000 U/L
Gestational 3HR Glucose Tolerance Test	**GTF** 70-94 mg/dL **GTHR** 70-179 mg/dL		The upper limits of the reference intervals for each fasting, 1 hour, 2 hour, and 3 hour samples are based on the Carpenter-Coustan criteria. According to the ADA practice recommendations, the diagnosis of GDM is made when at least 2 of the four plasma glucose levels meet or exceed the Carpenter-Coustan criteria, although The American College of Obstetricians and Gynecologists notes that some clinicians choose to use just one elevated value.	Photometric rate with hexokinase		10-800 mg/dL	10-2,400 mg/dL
Glucose	0-30 days: 55-115 mg/dL 31-182 days: 57-117 mg/dL		The reference interval provided is for plasma glucose measurements from samples collected after an 8 hour fast (no caloric intake).	Photometric rate with hexokinase	ADA Standards October 2012, Clinical Guide to Laboratory Tests, Tietz, 1995; Pediatric Reference Ranges, Soldin, 1999.	10-800 mg/dL	10-2,400 mg/dL
Glucose Body Fluid			**Amniotic:** Amniotic fluid glucose concentrations < 10 mg/dL are consistent with intra-amniotic inflammation in patients with prelabor rupture of membranes. **Peritoneal:** Peritoneal glucose concentrations >50 mg/dL (2.8 mmol/L) are consistent with spontaneous bacterial peritonitis and concentrations below this are consistent with secondary bacterial peritonitis due to gut perforation. **Pericardial:** Pericardial fluid glucose to serum/plasma glucose ratios are 1.0 in presumed 'normal' patients. **Pancreatic Body Cyst:** Pancreatic Cyst Glucose measurements of ≤ 50 mg/dL are suggestive of a mucinous lesion. **Pleural:** Pleural fluid glucose concentrations are equivalent to serum/plasma glucose concentrations in the absence of pleural pathology. Pleural fluid glucose concentrations < 60 mg/dL may indicate parapneumonic or malignant effusion. Other less common effusions associated with low glucose concentrations include hemothorax, tuberculosis, rheumatoid pleuritis, Churg-Strauss syndrome, paragonimiasis, and lupus pleuritis. **Synovial:** Synovial fluid glucose concentrations lower than glucose in serum/plasma are associated with infection.	Photometric rate with hexokinase	Amniotic: Gonzalez-Bosquet, et al. J Matern Fetal Med. Jul-Aug 1999;8(4):155-8. Pancreatic cyst: Carr, et al. Surgery. 2018 Mar;163(3):600-605. Peritoneal: Runyon BA, Hoefs JC. Hepatology. 1985;5(2):257. Pericardial: Ben-Horin S, et al. Am J Med 2005;118:636-40. Pleural: Touhes, et al. J Thorac Dis. 2017;9(5):1209-1218. Light, RW. N Engl J Med. 2002 Jun 20;346(23):1971-1977 Synovial: Margaretten, et al. JAMA. 2007;297(13):1478-1488.	10-800 mg/dL	10-800 mg/dL
Glucose CSF	40-70 mg/dL			Photometric rate with hexokinase	Clinical Guide to Laboratory Tests, Tietz, 1995	10-800 mg/dL	10-800 mg/dL
Glucose Fasting	0-30 days: 55-115 mg/dL 31-182 days: 57-117 mg/dL 183-365 days: 70-128 mg/dL 1+ years: 70-99 mg/dL			Photometric rate with hexokinase	ADA Standards October 2012, Clinical Guide to Laboratory Tests, Tietz, 1995; Pediatric Reference Ranges, Soldin, 1999.	10-800 mg/dL	10-2,400 mg/dL
Haptoglobin	44-215 mg/dL			Turbidimetry	Package Insert. Verified by OSUWMC Reference Interval Study 2021.	30-400 mg/dL	30-1,200 mg/dL
hCG, Qualitative, Urine			Negative	Lateral-flow test using a monoclonal antibody specific to the beta subunit of hCG.	Package insert		Negative, Positive
hCG, Quant (Tumor Marker)	<10.0 mIU/mL			Two-site sandwich immunoassay chemiluminescent	Advia Centaur tHCG Package Insert 10834917_EN Rev. F, 2011-04.	2.6-1,000.0 mIU/mL	2.6-128,000,000.0 mIU/mL
HDL Cholesterol	0-9 years: 35-82 mg/dL 10-13 years: 36-84 mg/dL			Enzymatic colorimetric	National Cholesterol Education Project (NCEP) Adult Treatment Protocol (ATP- III) (Circulation, 2002;106:3143-3421)	3-200 mg/dL	3-200 mg/dL
Hepatic Function Panel	**ALB** 0-30 days: 2.7-4.3 g/dL 31-182 days: 2.9-4.2 g/dL 183-365 days: 3.3-4.8 g/dL 1-19 years: 2.9-4.2 g/dL 19+ years: 3.5-5.0 g/dL **DBIL** <0.3 mg/dL **TBIL** 0-1 day: 1.4-8.7 mg/dL 1-2 days: 3.4-11.5 mg/dL 3-4 days: 1.5-12.0 mg/dL 5-365 days: 0.3-1.2 mg/dL 1+ years: <1.5 mg/dL **ALP** 0-30 days: 48-406 U/L 31-365 days: 124-341 U/L 1-3 years: 108-317 U/L 4-6 years: 96-297 U/L 7-9 years: 69-325 U/L 10-12 years: 51-332 U/L 13-15 years: 50-162 U/L 16-18 years: 47-119 U/L 19+ years: 32-126 U/L	**ALB** 0-30 days: 2.6-4.1 g/dL 31-182 days: 2.8-4.6 g/dL 183-365 days: 2.8-4.8 g/dL 1-19 years: 3.2-4.7 g/dL 19+ years: 3.5-5.0 g/dL **DBIL** <0.3 mg/dL **TBIL** 0-1 day: 1.4-8.7 mg/dL 1-2 days: 3.4-11.5 mg/dL 3-4 days: 1.5-12.0 mg/dL 5-365 days: 0.3-1.2 mg/dL 1+ years: <1.5 mg/dL **ALP** 0-30 days: 75-316 U/L 31-365 days: 82-383 U/L 1-3 years: 104-365 U/L 4-6 years: 93-309 U/L 7-9 years: 86-315 U/L 10-12 years: 42-362 U/L 13-15 years: 74-390 U/L 16-18 years: 52-171 U/L 19+ years: 32-126 U/L		**ALB** Colorimetric; Bromocresol green. **DBIL** Photometric with diazonium salt, 3,5-dichlorosaniline (DPD). **TBIL** Photometric with 3,5-dichlorophenyldiazonium tetrafluoroborate (DPD), and caffeine and a surfactant as accelerators. **ALP** Photometric rate with p-nitro-phenylphosphate (pNPP) in the presence of 2-amino-2-methyl-1-propanol (AMP) at	See individual analytes	See individual analytes	See individual analytes

	ALT 0-30 days: 8-25 U/L 31 days-4 years: 8-30 U/L 4-6 years: 8-25 U/L 7-9 years: 8-23 U/L 10-17 years: 8-20 U/L 18+ years: 9-46 U/L **AST** 0-30 days: 0-49 U/L 31-365 days: 0-80 U/L 1-3 years: 0-70 U/L 4-6 years: 0-60 U/L 7-9 years: 0-42 U/L 10-12 years: 0-38 U/L 13-15 years: 0-33 U/L 16-18 years: 0-31 U/L 19+ years: 10-39 U/L **TP** 0-30 days: 4.2-6.2 g/dL 31-182 days: 4.4-6.9 g/dL 183-365 days: 5.6-7.9 g/dL 1-18 years: 5.7-8.0 g/dL 19+ years: 6.4-8.3 g/dL	**ALT** 0-30 days: 8-25 U/L 31-365 days: 8-35 U/L 1-3 years: 8-30 U/L 4-6 years: 8-20 U/L 7-9 years: 8-25 U/L 10-17 years: 8-30 U/L 18+ years: 10-52 U/L **AST** 0-30 days: 0-52 U/L 31-365 days: 0-66 U/L 1-3 years: 0-57 U/L 4-6 years: 0-49 U/L 7-9 years: 0-43 U/L 10-12 years: 0-39 U/L 13-15 years: 0-40 U/L 16-18 years: 0-40 U/L 19+ years: 10-39 U/L **TP** 0-30 days: 4.1-6.3 g/dL 31-182 days: 4.7-6.7 g/dL 183-365 days: 5.5-7.0 g/dL 1-18 years: 5.7-8.0 g/dL 19+ years: 6.4-8.3 g/dL		pH 10.4. **ALT** Photometric rate with alanine to α-oxoglutarate to form pyruvate and glutamate. This assay does not contain pyridoxyl-5-phosphate. **AST** Photometric rate with aspartate and α-oxoglutarate to form pyruvate and glutamate. This assay does not contain pyridoxyl-5-phosphate. **TP** Colorimetric with cupric ions in an alkaline solution.			
High Sensitivity Troponin I - Single Order	<34 ng/L	<53 ng/L		Three-site sandwich immunoassay using direct chemiluminometric technology.	Atellica IM TnIH Package Insert 11200498_EN Rev. 06, 2019-06.	3-25,000 ng/L	3-2,000,000 ng/L
High Sensitivity Troponin I x2	<34 ng/L	<53 ng/L		Three-site sandwich immunoassay using direct chemiluminometric technology.	Atellica IM TnIH Package Insert 11200498_EN Rev. 06, 2019-06.	3-25,000 ng/L	3-2,000,000 ng/L
HBV 1 and 2 Antibodies/p24 Antigen			Non Reactive	Two-step sandwich immunoassay	Package Insert		Non Reactive, Reactive
Homocysteine	3.7-13.9 µmol/L			Competitive immunoassay using direct chemiluminescent technology.	Atellica IM Homocysteine Package Insert 10995362_EN Rev. 04-2021-03	0.5-65.0 µmol/L	0.5-130.0 µmol/L
IgA	0-30 days: 0-10 mg/dL 31-182 days: ≤42 mg/dL 183-365 days: 6-68 mg/dL 1-3 years: 15-111 mg/dL 4-6 years: 33-166 mg/dL 7-9 years: 28-180 mg/dL 10-12 years: 55-193 mg/dL 13-15 years: 62-241 mg/dL 16-18 years: 69-262 mg/dL 19-59 years: 66-433 mg/dL 60+ years: 90-410 mg/dL	0-30 days: ≤11 mg/dL 31-182 days: ≤40 mg/dL 183-365 days: 1-82 mg/dL 1-3 years: 9-137 mg/dL 4-6 years: 44-187 mg/dL 7-9 years: 58-204 mg/dL 10-12 years: 46-218 mg/dL 13-15 years: 29-251 mg/dL 16-18 years: 68-259 mg/dL 19-59 years: 66-433 mg/dL 60+ years: 90-410 mg/dL		Turbidimetry	Package Insert. Verified by OSUWMC Reference Interval Study 2021.	10-700 mg/dL	10-14,000 mg/dL
IgG	0-30 days: 162-872 mg/dL 31-182 days: 311-664 mg/dL 183-365 days: 325-647 mg/dL 1-3 years: 451-1,202 mg/dL 4-6 years: 560-1,319 mg/dL 7-9 years: 485-1,473 mg/dL 10-12 years: 586-1,609 mg/dL 13-15 years: 749-1,640 mg/dL 16-18 years: 804-1,817 mg/dL 19-59 years: 600-1,714 mg/dL 60+ years: 600-1,560 mg/dL	0-30 days: 197-833 mg/dL 31-182 days: 140-533 mg/dL 183-365 days: 130-623 mg/dL 1-3 years: 413-1,112 mg/dL 4-6 years: 468-1,328 mg/dL 7-9 years: 582-1,441 mg/dL 10-12 years: 685-1,620 mg/dL 13-15 years: 590-1,600 mg/dL 16-18 years: 522-1,703 mg/dL 19-59 years: 600-1,714 mg/dL 60+ years: 600-1,560 mg/dL		Turbidimetry	OSUWMC Immunoglobulin Reference Range Study; Verified by OSUWMC Reference Interval Study 2021.	75-3,000 mg/dL	75-60,000 mg/dL
IgM	0-29 days: 1-57 mg/dL 30-182 days: <128 mg/dL 183-365 days: <131 mg/dL 1-3 years: 35-184 mg/dL 4-6 years: 42-184 mg/dL 7-9 years: 30-165 mg/dL 10-12 years: 42-211 mg/dL 13-15 years: 34-225 mg/dL 16-18 years: 45-224 mg/dL 19-59 years: 45-281 mg/dL 60+ years: 30-360 mg/dL	0-29 days: 0-65 mg/dL 30-182 days: 6-84 mg/dL 183-365 days: 15-117 mg/dL 1-3 years: 30-146 mg/dL 4-6 years: 31-151 mg/dL 7-9 years: 21-140 mg/dL 10-12 years: 27-151 mg/dL 13-15 years: 26-184 mg/dL 16-18 years: 28-179 mg/dL 19-59 years: 45-281 mg/dL 60+ years: 30-360 mg/dL		Turbidimetry	Package Insert. Verified by OSUWMC Reference Interval Study 2021.	20-500 mg/dL	20-50,000 mg/dL
Immunoglobulins IgG IgA IgM	**IGA** 0-30 days: 0-10 mg/dL 31-182 days: ≤42 mg/dL 183-365 days: 6-68 mg/dL 1-3 years: 15-111 mg/dL 4-6 years: 33-166 mg/dL 7-9 years: 28-180 mg/dL 10-12 years: 55-193 mg/dL 13-15 years: 62-241 mg/dL 16-18 years: 69-262 mg/dL 19-59 years: 66-433 mg/dL 60+ years: 90-410 mg/dL **IGG** 0-30 days: 162-872 mg/dL 31-182 days: 311-664 mg/dL 183-365 days: 325-647 mg/dL 1-3 years: 451-1,202 mg/dL 4-6 years: 560-1,319 mg/dL 7-9 years: 485-1,473 mg/dL 10-12 years: 586-1,609 mg/dL 13-15 years: 749-1,640 mg/dL 16-18 years: 804-1,817 mg/dL 19-59 years: 600-1,714 mg/dL 60+ years: 600-1,560 mg/dL **IGM** 0-29 days: 1-57 mg/dL 30-182 days: <128 mg/dL 183-365 days: <131 mg/dL 1-3 years: 35-184 mg/dL 4-6 years: 42-184 mg/dL 7-9 years: 30-165 mg/dL 10-12 years: 42-211 mg/dL 13-15 years: 34-225 mg/dL 16-18 years: 45-224 mg/dL 19-59 years: 45-281 mg/dL 60+ years: 30-360 mg/dL	**IGA** 0-30 days: ≤11 mg/dL 31-182 days: ≤40 mg/dL 183-365 days: 1-82 mg/dL 1-3 years: 9-137 mg/dL 4-6 years: 44-187 mg/dL 7-9 years: 58-204 mg/dL 10-12 years: 46-218 mg/dL 13-15 years: 29-251 mg/dL 16-18 years: 68-259 mg/dL 19-59 years: 66-433 mg/dL 60+ years: 90-410 mg/dL **IGG** 0-30 days: 197-833 mg/dL 31-182 days: 140-533 mg/dL 183-365 days: 130-623 mg/dL 1-3 years: 413-1,112 mg/dL 4-6 years: 468-1,328 mg/dL 7-9 years: 582-1,441 mg/dL 10-12 years: 685-1,620 mg/dL 13-15 years: 590-1,600 mg/dL 16-18 years: 522-1,703 mg/dL 19-59 years: 600-1,714 mg/dL 60+ years: 600-1,560 mg/dL **IGM** 0-29 days: 0-65 mg/dL 30-182 days: 6-84 mg/dL 183-365 days: 15-117 mg/dL 1-3 years: 30-146 mg/dL 4-6 years: 31-151 mg/dL 7-9 years: 21-140 mg/dL 10-12 years: 27-151 mg/dL 13-15 years: 26-184 mg/dL 16-18 years: 28-179 mg/dL 19-59 years: 45-281 mg/dL 60+ years: 30-360 mg/dL		Turbidimetry	See individual analytes	See individual analytes	See individual analytes
Iron	0-30 days: 29-127 mcg/dL 31-365 days: 25-126 mcg/dL 1-3 years: 25-101 mcg/dL 4-6 years: 28-93 mcg/dL 7-9 years: 30-104 mcg/dL 10-12 years: 32-104 mcg/dL 13-15 years: 30-109 mcg/dL 16-18 years: 35-102 mcg/dL 19+ years: 40-174 mcg/dL	0-30 days: 32-112 mcg/dL 31-365 days: 27-109 mcg/dL 1-3 years: 29-91 mcg/dL 4-6 years: 25-115 mcg/dL 7-9 years: 27-96 mcg/dL 10-12 years: 28-112 mcg/dL 13-15 years: 26-110 mcg/dL 16-18 years: 27-138 mcg/dL 19+ years: 40-174 mcg/dL		Colorimetric	Established by OSUWMC Reference Interval Study 2013, verified by OSUWMC Reference Interval study 2021.	10-1,000 mcg/dL	10-2,000 mcg/dL
Iron/Iron Binding/Transferrin	**IRON** 0-30 days: 29-127 mcg/dL 31-365 days: 25-126 mcg/dL 1-3 years: 25-101 mcg/dL 4-6 years: 28-93 mcg/dL 7-9 years: 30-104 mcg/dL 10-12 years: 32-104 mcg/dL 13-15 years: 30-109 mcg/dL 16-18 years: 33-102 mcg/dL 19+ years: 40-174 mcg/dL **TRAN** 200-400 mg/dL **TIBC** 0-30 days: 94-236 mcg/dL 31-182 days: 89-311 mcg/dL 183-365 days: 138-365 mcg/dL 1-3 years: 184-377 mcg/dL 4-6 years: 162-352 mcg/dL 7-9 years: 167-336 mcg/dL 10-12 years: 198-383 mcg/dL 13-15 years: 169-358 mcg/dL 16-18 years: 194-372 mcg/dL 19+ years: 250-425 mcg/dL **IRON SATURATION** 20-55%	**IRON** 0-30 days: 32-112 mcg/dL 31-365 days: 27-109 mcg/dL 1-3 years: 29-91 mcg/dL 4-6 years: 25-115 mcg/dL 7-9 years: 27-96 mcg/dL 10-12 years: 28-112 mcg/dL 13-15 years: 26-110 mcg/dL 16-18 years: 27-138 mcg/dL 19+ years: 40-174 mcg/dL **TRAN** 200-400 mg/dL **TIBC** 0-30 days: 94-232 mcg/dL 31-182 days: 116-322 mcg/dL 183-365 days: 176-384 mcg/dL 1-3 years: 204-382 mcg/dL 4-6 years: 180-390 mcg/dL 7-9 years: 183-369 mcg/dL 10-12 years: 173-356 mcg/dL 13-15 years: 193-377 mcg/dL 16-18 years: 174-351 mcg/dL 19+ years: 250-425 mcg/dL **IRON SATURATION** 20-55%		**IRON** Colorimetric **TRAN** In the procedure, the measurement of the decrease in light transmitted (increase in absorbance) through particles suspended in solution as a result of complexes formed during the antigen-antibody reaction, is the basis of this assay. **IRON SATURATION** (Iron/TIBC)*100	Transferrin: Clinical Guide to Laboratory Tests, Tietz, 1995; Pediatric Reference Ranges, Soldin, 1999 Iron: Established by OSUWMC Reference Interval Study 2013, verified by OSUWMC Reference Interval study 2021.	TRANSFERRIN: 75-750 mg/dL IRON: 10-1,000 mcg/dL	TRANSFERRIN: 75-2,250 mg/dL IRON: 10-2,000 mcg/dL
Lactate Dehydrogenase	0-30 days: 145-765 U/L 31-365 days: 190-420 U/L 1-3 years: 165-395 U/L 4-6 years: 135-345 U/L 7-9 years: 140-280 U/L 10-12 years: 120-260 U/L 13-15 years: 100-275 U/L 16-18 years: 105-230 U/L 19+ years: 100-190 U/L	0-30 days: 125-735 U/L 31-365 days: 170-450 U/L 1-3 years: 155-345 U/L 4-6 years: 155-345 U/L 7-9 years: 145-300 U/L 10-12 years: 120-325 U/L 13-15 years: 120-290 U/L 16-18 years: 105-235 U/L 19+ years: 100-190 U/L		Photometric rate	Clinical Guide to Laboratory Tests, Tietz, 1995; verified by OSUWMC Reference Interval Study 2021. Pediatric Reference Ranges, Soldin, 1999.	25-1,200 U/L	25-60,000 U/L

Lactate Dehydrogenase Body Fluid			**Pleural:** A Pleural fluid LDH to serum/plasma LDH ratio > 0.6 or a pleural fluid LDH concentration > two-thirds the upper limit of the serum/plasma LDH reference interval suggest an exudate. **Pericardial:** Pericardial fluid LDH to serum/plasma LDH ratio > 0.6 or > 300 U/L suggests an exudate. **Peritoneal/Ascites:** Peritoneal fluid LDH to serum/plasma LDH ratio > 0.6 is consistent with an exudate. **CSF:** Elevated LDH in CSF specimens may indicate a non-specific immune process. CSF LDH measurements above 40 U/L may be associated with Jakob-Creutzfeldt Disease, Bacterial Meningitis, Neurosyphilis, or tumors of the central nervous system. Contamination of red blood cells can falsely increase LDH measurements. **Amniotic Fluid:** The reference range has not been established for this fluid type. The fluid results should be compared with the concentration in serum/plasma or integrated into the clinical context for interpretation.	Photometric rate	CSF: Clinical Utility of Biochemical Analysis of Cerebrospinal Fluid Clinical Chemistry 1995 Watson MA. Pericardial and peritoneal: Burgess. Clinical Chemical Acta 343 (2004) 61–84. Pleural Light, RW. N Engl J Med. 2002 Jun 20;346(23):1971–1977.	25-1,200 U/L	25-30,000 U/L
Lactate, Blood	0.5-1.6 mmol/L 0.5-2.2 mmol/L			Enzymatic colorimetric		GEM 7000: 0.3-17.0 mmol/L DXC: 0.2–10.0 mmol/L	GEM 7000: 0.3-17.0 mmol/L DXC: 0.2–30.0 mmol/L
Lactate, CSF	<2.8 mmol/L			Enzymatic colorimetric	Beckman Coulter literature which cites Clinical Guide to Laboratory Tests, Tietz, 1995	0.2-10.0 mmol/L	0.2-30.0 mmol/L
Lactate, Fluid			The reference range has not been established for this fluid specimen. The fluid results should be compared with the concentration in serum/plasma or integrated into the clinical context for interpretation.	Enzymatic colorimetric		0.2-10.0 mmol/L	0.2-30.0 mmol/L
LDL, Direct Measure	<100 mg/dL			Enzymatic colorimetric	National Cholesterol Education Project (NCEP) Adult Treatment Protocol (ATP- III) (Circulation, 2002;106:3143-3421)	7-400 mg/dL	7-400 mg/dL
LH	0-365 days: 0.01-1.00 mIU/mL 1-10 years: 0.00-0.10 mIU/mL 11-13 years: 0.37-6.23 mIU/mL 14-18 years: 0.37-17.30 mIU/mL	0-365 days: <3.24 mIU/mL 1-10 years 0.00-0.10 mIU/mL 11-13 years: 0.08-2.58 mIU/mL 14-18 years: 0.97-6.37 mIU/mL	Male: 19-70 years: 1.5-9.3 mIU/mL >70 years: 3.1-4.6 mIU/mL 19+ years Female: Follicular phase: 1.9-12.5 mIU/mL Midcycle peak: 8.7-76.3 mIU/mL Luteal phase: 0.5-16.9 mIU/mL Pregnant: <0.1-1.5 mIU/mL Postmenopausal: 15.9-54.0 mIU/mL Contraceptives: 0.7-5.6 mIU/mL	Two-site sandwich immunoassay chemiluminescent	Atellica IM LH Package Insert 11200385_EN Rev. 04-2020-06; Pediatric Reference Ranges, Soldin, 1999	0.07-200.00 mIU/mL	0.07-6,400.00 mIU/mL
Lipase	0-30 days: 6-55 U/L 31-182 days: 4-29 U/L			Photometric rate	Beckman Coulter Chemistry Information Sheet, 9/2020; verified by OSUWMC Reference Interval Study 2021. Pediatric Reference Ranges, 1999.	6-600 U/L	6-6,000 U/L
Lipid Panel w Calculated LDL	**CHOL** 0-30 days: 62-155 mg/dL 31-182 days: 62-141 mg/dL 183-365 days: 76-216 mg/dL 1-3 years: 108-193 mg/dL 4-6 years: 106-193 mg/dL 7-9 years: 104-210 mg/dL 10-12 years: 105-218 mg/dL 13-15 years: 108-205 mg/dL 16-18 years: 92-234 mg/dL 19+ years: <200 mg/dL **TRIG** 0-3 years: 27-125 mg/dL 4-6 years: 32-116 mg/dL 7-9 years: 28-129 mg/dL 10-11 years: 39-140 mg/dL 12-13 years: 37-130 mg/dL 14-15 years: 38-135 mg/dL 16-19 years: 37-140 mg/dL 20+ years: <150 mg/dL **HDL** 0-9 years: 35-82 mg/dL 10-13 years: 36-84 mg/dL 14-19 years: 35-65 mg/dL 20+ years: ≥40 mg/dL **LDL CALC** 0-59 days: <130 mg/dL 60-365 days: 32-117 mg/dL 1-2 years: 38-140 mg/dL 2+ years: 0-99 mg/dL **TOT CHOL/HDL** <4.5 **NON HDL** <130 mg/dL	**CHOL** 0-30 days: 54-151 mg/dL 31-182 days: 81-147mg/dL 183-365 days: 76-179 mg/dL 1-3 years: 85-182 mg/dL 4-6 years: 110-217 mg/dL 7-9 years: 110-211 mg/dL 10-12 years: 105-223 mg/dL 13-15 years: 91-204 mg/dL 16-18 years: 82-192 mg/dL 19+ years: <200 mg/dL **TRIG** 0-3 years: 27-125 mg/dL 4-6 years: 32-116 mg/dL 7-9 years: 28-129 mg/dL 10-11 years: 24-137 mg/dL 12-13 years: 24-145 mg/dL 14-15 years: 34-165 mg/dL 16-19 years: 34-140 mg/dL 20+ years: <150 mg/dL **HDL** 0-9 years: 35-82 mg/dL 10-13 years: 36-84 mg/dL 14-19 years: 35-65 mg/dL 20+ years: ≥40 mg/dL **LDL CALC** 0-59 days: <130 mg/dL 60-365 days: 32-117 mg/dL 1-2 years: 38-140 mg/dL 2+ years: 0-99 mg/dL **TOT CHOL/HDL** <4.5 **NON HDL** <130 mg/dL		**CHOL** Enzymatic colorimetric **TRIG** Enzymatic colorimetric **HDL** Enzymatic colorimetric **LDL CALC** T Cholesterol – HDL – (Trig/5)	See individual analytes	See individual analytes	See individual analytes
Lipid Panel with Reflex to Measured LDL	**CHOL** 0-30 days: 62-155 mg/dL 31-182 days: 62-141 mg/dL 183-365 days: 76-216 mg/dL 1-3 years: 108-193 mg/dL 4-6 years: 106-193 mg/dL 7-9 years: 104-210 mg/dL 10-12 years: 105-218 mg/dL 13-15 years: 108-205 mg/dL 16-18 years: 92-234 mg/dL 19+ years: <200 mg/dL **TRIG** 0-3 years: 27-125 mg/dL 4-6 years: 32-116 mg/dL 7-9 years: 28-129 mg/dL 10-11 years: 39-140 mg/dL 12-13 years: 37-130 mg/dL 14-15 years: 38-135 mg/dL 16-19 years: 37-140 mg/dL 20+ years: <150 mg/dL **HDL** 0-9 years: 35-82 mg/dL 10-13 years: 36-84 mg/dL 14-19 years: 35-65 mg/dL 20+ years: ≥40 mg/dL **LDL CALC** 0-59 days: <130 mg/dL 60-365 days: 32-117 mg/dL 1-2 years: 38-140 mg/dL 2+ years: 0-99 mg/dL **TOT CHOL/HDL** <4.5 **NON HDL** <130 mg/dL	**CHOL** 0-30 days: 54-151 mg/dL 31-182 days: 81-147mg/dL 183-365 days: 76-179 mg/dL 1-3 years: 85-182 mg/dL 4-6 years: 110-217 mg/dL 7-9 years: 110-211 mg/dL 10-12 years: 105-223 mg/dL 13-15 years: 91-204 mg/dL 16-18 years: 82-192 mg/dL 19+ years: <200 mg/dL **TRIG** 0-3 years: 27-125 mg/dL 4-6 years: 32-116 mg/dL 7-9 years: 28-129 mg/dL 10-11 years: 24-137 mg/dL 12-13 years: 24-145 mg/dL 14-15 years: 34-165 mg/dL 16-19 years: 34-140 mg/dL 20+ years: <150 mg/dL **HDL** 0-9 years: 35-82 mg/dL 10-13 years: 36-84 mg/dL 14-19 years: 35-65 mg/dL 20+ years: ≥40 mg/dL **LDL CALC** 0-59 days: <130 mg/dL 60-365 days: 32-117 mg/dL 1-2 years: 38-140 mg/dL 2+ years: 0-99 mg/dL **TOT CHOL/HDL** <4.5 **NON HDL** <130 mg/dL		**CHOL** Enzymatic colorimetric **TRIG** Enzymatic colorimetric **HDL** Enzymatic colorimetric **LDL CALC** T Cholesterol – HDL – (Trig/5) **LDL DIRECT** Enzymatic colorimetric	See individual analytes	See individual analytes	See individual analytes

Lipids w Direct Measure LDL	**CHOL** 0-30 days: 62-155 mg/dL 31-182 days: 62-143 mg/dL 183-365 days: 76-216 mg/dL 1-3 years: 108-193 mg/dL 4-6 years: 106-193 mg/dL 7-9 years: 104-210 mg/dL 10-12 years: 105-218 mg/dL 13-15 years: 108-205 mg/dL 16-18 years: 92-234 mg/dL 19+ years: <200 mg/dL **TRIG** 0-3 years: 27-125 mg/dL 4-6 years: 32-116 mg/dL 7-9 years: 28-129 mg/dL 10-11 years: 39-140 mg/dL 12-13 years: 37-130 mg/dL 14-15 years: 36-153 mg/dL 16-19 years: 37-140 mg/dL 20+ years: <150 mg/dL **HDL** 0-9 years: 35-82 mg/dL 10-13 years: 36-84 mg/dL 14-19 years: 35-65 mg/dL 20+ years: ≥40 mg/dL **LDL DIRECT** <100 mg/dL **TOT CHOL/HDL** <4.5 **NON HDL** <130 mg/dL.	**CHOL** 0-30 days: 54-151 mg/dL 31-182 days: 81-147mg/dL 183-365 days: 76-179 mg/dL 1-3 years: 85-182 mg/dL 4-6 years: 110-217 mg/dL 7-9 years: 110-211 mg/dL 10-12 years: 105-223 mg/dL 13-15 years: 91-204 mg/dL 16-18 years: 82-192 mg/dL 19+ years: <200 mg/dL **TRIG** 0-3 years: 27-125 mg/dL 4-6 years: 32-116 mg/dL 7-9 years: 28-129 mg/dL 10-11 years: 24-137 mg/dL 12-13 years: 24-145 mg/dL 14-15 years: 34-165 mg/dL 16-19 years: 34-140 mg/dL 20+ years: <150 mg/dL **HDL** 0-9 years: 35-82 mg/dL 10-13 years: 36-84 mg/dL 14-19 years: 35-65 mg/dL 20+ years: ≥40 mg/dL **LDL DIRECT** <100 mg/dL **TOT CHOL/HDL** <4.5 **NON HDL** <130 mg/dL.		**CHOL** Enzymatic colorimetric **TRIG** Enzymatic colorimetric **HDL** Enzymatic colorimetric **LDL DIRECT** Enzymatic colorimetric	See individual analytes	See individual analytes	See individual analytes
Lipoprotein (A)	<125 nmol/L		Lp(a) ≥ 75 nmol/L is considered elevated. Lp(a) ≥ 125 nmol/L is considered risk-enhacing for ASCVD.	Immunoturbidimetric assay	2018 AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA Guideline on theManagement of Blood Cholesterol. Grundy SM, et al. J Am Coll Cardiol. 2019.	12-206 nmol/L	12-206 nmol/L
Lithium Level	Therapeutic Range: 0-59 years: 0.60-1.20 mmol/L 60+ years: 0.40-0.80 mmol/L			A spectrophotometric method which can be readily adopted to automated clinical chemistry analysers. Lithium present in the sample reacts with a substituted porphyrin compound at an alkaline pH, resulting in a change in absorbance which is directly proportional to the concentration of Lithium in the sample.	Applied Clinical Pharmacokinetics, Bauer, 2001; Clinical Pharmacokinetics, Eilers, 1995;29:442-50 Bipolar Disord. 2019 Mar;21(2):117-123. Bipolar Disord. 2019 May;21(3):190-191.	0.10-5.00 mmol/L	0.10-5.00 mmol/L
Lytes (Na, K, Cl) - Urine - Random			The reference range has not been established for random urine specimens. The test result should be integrated into the clinical context for interpretation.	**NA/KCL** Indirect ion-selective electrode	See individual analytes	See individual analytes	See individual analytes
Lytes (Na, K, Cl) - Urine 24HR	**UNA** 40-220 mmol/24 hrs			**NA/KCL** Indirect ion-selective electrode	See individual analytes		
Lytes (Na, K, Cl) Plus CO2	**NA** 0-6 days: 133-146 mmol/L 7-30 days: 134-144 mmol/L 31-182 days: 134-142 mmol/L 183-365 days: 133-142 mmol/L 1+ years: 135-145 mmol/L **K** 0-7 days: 3.2-5.5 mmol/L 8-30 days: 3.4-6.0 mmol/L 31-182 days: 3.5-5.6 mmol/L 183-365 days: 3.5-6.1 mmol/L 1-17 years: 3.3-4.6 mmol/L 18+ years: 3.5-5.0 mmol/L **CL** 0-365 days: 98-113 mmol/L 1-17 years: 102-112 mmol/L 18+: 98-108 mmol/L **CO2** 0-2 years: 13-29 mmol/L 3+ years: 21-31 mmol/L **ANION GAP** 7-17 mmol/L			**NA/KCL** Indirect ion-selective electrode **CO2** Photometric	See individual analytes	See individual analytes	See individual analytes
Lytes (Na, K, Cl, Creat), Urine, Random			The reference range has not been established for random urine specimens. The test result should be integrated into the clinical context for interpretation.	**NA/KCL** Indirect ion-selective electrode **CREA** Kinetic Jaffe	See individual analytes	See individual analytes	See individual analytes
Magnesium	0-30 days: 1.7-2.5 mg/dL 31-365 days: 1.9-2.4 mg/dL 1-3 years: 1.7-2.4 mg/dL 4-6 years: 1.7-2.2 mg/dL 7-9 years: 1.6-2.3 mg/dL 10-12 years: 1.6-2.2 mg/dL 13-15 years: 1.6-2.3 mg/dL 16-18 years: 1.5-2.2 mg/dL 19+ years: 1.6-2.6 mg/dL	0-30 days: 1.7-2.4 mg/dL 31-365 days: 1.6-2.3 mg/dL 1-3 years: 1.7-2.4 mg/dL 4-6 years: 1.7-2.4 mg/dL 7-9 years: 1.7-2.3 mg/dL 10-12 years: 1.6-2.2 mg/dL 13-15 years: 1.6-2.3 mg/dL 16-18 years: 1.5-2.2 mg/dL 19+ years: 1.6-2.6 mg/dL		Colorimetric with xylidyl blue	Clinical Guide to Laboratory Tests, Tietz, 1995; verified by OSUWMC Reference Interval Study 2021. Pediatric Reference Ranges, Soldin, 1999.	0.5-8.0 mg/dL	0.5-24.0 mg/dL
Magnesium, 24HR Urine	72.9-121.5 mg/24 hrs			Colorimetric with xylidyl blue	Clinical Guide to Laboratory Tests, Tietz, 1995		
Magnesium, Urine, Random			The reference range has not been established for random urine specimens. The test result should be integrated into the clinical context for interpretation.	Colorimetric with xylidyl blue		0.5-10.0 mg/dL	0.5-100.0 mg/dL
Maternal High Risk Stat HIV			Non Reactive	Two-step sandwich immunoassay	Package Insert		Non Reactive, Reactive
Mechanical Support Hemolysis	**HAPTO** 44-215 mg/dL **LDHFX** 0-30 days: 145-765 U/L 31-365 days: 190-420 U/L 1-3 years: 165-395 U/L 4-6 years: 135-345 U/L 7-9 years: 140-280 U/L 10-12 years: 120-260 U/L 13-15 years: 100-275 U/L 16-18 years: 105-230 U/L 19+ years: 100-190 U/L	**HAPTO** 44-215 mg/dL **LDHFX** 0-30 days: 125-735 U/L 31-365 days: 170-450 U/L 1-3 years: 155-345 U/L 4-6 years: 155-345 U/L 7-9 years: 145-300 U/L 10-12 years: 120-325 U/L 13-15 years: 120-290 U/L 16-18 years: 105-255 U/L 19+ years: 100-190 U/L			See individual analytes	See individual analytes	See individual analytes
Methotrexate Level			Given the wide variability in methotrexate protocols and individual drug clearance, clinical management decisions should be made by the primary attending physician.	Homogeneous enzyme immunoassay	OSU Pharmacy	0.04-1.20 µmol/L	0.04-1,200.00 µmol/L
Microalbumin, 24HR Urine	≤30.0 mg/24 hrs			Turbidimetric	Package insert	7.0-450.0	7-4500.0
Microalbumin, Random Urine	**RATIO** ≤30.0 mg/g			Turbidimetric	See individual analytes	See individual analytes	See individual analytes
Mononucleosis Screen			Negative	Color immunochromatographic dipstick technology with bovine erythrocyte extract coated on the membrane. In the test procedure serum is mixed with the Diluent. Then the Test Strip is placed in the mixture and the mixture migrates along the membrane.	Sure Vue Signature Mono Package Insert		Negative, Positive
Non-Gestational 2HR Glucose Tolerance Test	**GTF** 70-125 mg/dL **G2T** 70-199 mg/dL		According to the American Diabetes Association's clinical practice recommendations, the diagnosis of diabetes mellitus can be made if either the fasting plasma glucose or the 2hr post-glucose samples meet or exceed 126 mg/dL or 200 mg/dL, respectively. The recommendations also note that in the absence of unequivocal hyperglycemia, the diagnosis requires two abnormal test results from the same sample or in two separate test samples. The ADA criteria for prediabetes is a fasting plasma glucose of 100-125 mg/dL or 2hr post-glucose sample of 140-199 mg/dL.	Photometric rate with hexokinase		10-800 mg/dL	10-2,400 mg/dL

NT-Pro B-Type Natriuretic Peptide	0-2 days: 321-11,987 pg/mL 3-11 days: 263-5,918 pg/mL 12 days-2 months: Not applicable 2 months-2 years: <646 pg/mL 2-3 years: <413 pg/mL 3-6 years: <289 pg/mL 7-14 years: ≤157 pg/mL 15-18 years: ≤158 pg/mL 19-39 years: <160 pg/mL 40-44 years: ≤162 pg/mL 45-54 years: ≤241 pg/mL 55-64 years: ≤226 pg/mL 65+ years: ≤540 pg/mL	0-2 days: 321-11,987 pg/mL 3-11 days: 263-5,918 pg/mL 12 days-2 months: Not applicable 2 months-2 years: <646 pg/mL 2-3 years: <413 pg/mL 3-6 years: <289 pg/mL 7-14 years: ≤157 pg/mL 15-18 years: ≤158 pg/mL 19-39 years: <79 pg/mL 40-44 years: ≤72 pg/mL 45-54 years: ≤87 pg/mL 55-64 years: ≤88 pg/mL 65+ years: ≤540 pg/mL		Two site sandwich immunoassay using direct chemiluminescent technology which uses constant amounts of two monoclonal antibodies.	Atellica IM NT-proBNPII Package Insert 11206327_EN Rev. 02, 2024-01	35-35,000 pg/mL	35-35,000,000 pg/mL
Osmolality	275-305 mOsm/kg			Freezing point depression	OSU, In House Reference Ranges Validation, 2017	50-2,000 mOsm/kg	50-2,000 mOsm/kg
Osmolality, 24 HR Urine	300-900 mOsm/kg			Freezing point depression	Clinical Guidelines for Laboratory Tests, Tietz, 1995	50-2,000 mOsm/kg	50-2,000 mOsm/kg
Osmolality, Urine	300-900 mOsm/kg			Freezing point depression	Clinical Guidelines for Laboratory Tests, Tietz, 1995	50-2,000 mOsm/kg	50-2,000 mOsm/kg
Pancreatic Fluid CEA			Fluid CEA values >192 ng/mL may indicate mucinous cystic lesions of the pancreas. Results <192 ng/mL require clinical correlations with patient history and other imaging modalities.		Clinical Guide to Laboratory Tests, Tietz, 1995; see Source link for additional Reference Range information	2.0-100.0 ng/mL	2.0-10,000.0 ng/mL
Pancreatic Function Test			Bicarbonate > 80 mmol/L is considered a normal result.	**NA/K/CL** Indirect ion-selective electrode **CO2** Photometric **AMY** Photometric **LIPA** Photometric	See individual analytes	See individual analytes	See individual analytes
Phenobarbital Level, Random	Therapeutic Range: 15.0-40.0 mcg/mL			The assay is based on competition between drug in the sample and drug labeled with the enzyme glucose-6-phosphate dehydrogenase (G6PDH) for antibody binding sites. Enzyme activity decreases upon binding to the antibody, so the drug concentration in the sample can be measured in terms of enzyme activity. Active enzyme converts nicotinamide adenine dinucleotide (NAD) to NADH, resulting in an absorbance change that is measured spectrophotometrically.	Applied Clinical Pharmacokinetics, 2001	5.0-80.0 mcg/mL	5.0-240.0 mcg/mL
Phenobarbital Level, Trough (Pre Drug Level)	Therapeutic Range: 15.0-40.0 mcg/mL			The assay is based on competition between drug in the sample and drug labeled with the enzyme glucose-6-phosphate dehydrogenase (G6PDH) for antibody binding sites. Enzyme activity decreases upon binding to the antibody, so the drug concentration in the sample can be measured in terms of enzyme activity. Active enzyme converts nicotinamide adenine dinucleotide (NAD) to NADH, resulting in an absorbance change that is measured spectrophotometrically.	Applied Clinical Pharmacokinetics, 2001	5.0-80.0 mcg/mL	5.0-240.0 mcg/mL
Phenytoin Total Level	Therapeutic Range: 10.0-20.0 mcg/mL			The assay is based on competition between drug in the sample and drug labeled with the enzyme glucose-6-phosphate dehydrogenase (G6PDH) for antibody binding sites. Enzyme activity decreases upon binding to the antibody, so the drug concentration in the sample can be measured in terms of enzyme activity. Active enzyme converts oxidized nicotinamide adenine dinucleotide (NAD) to NADH, resulting in an absorbance change that is measured spectrophotometrically.	Applied Clinical Pharmacokinetics, 2001	2.5-40.0 mcg/mL	2.5-200.0 mcg/mL
Phosphate, Inorganic	0-30 days: 4.3-7.7 mg/dL 31-365 days: 3.7-6.5 mg/dL 1-3 years: 3.4-6.0 mg/dL 4-6 years: 3.2-5.5 mg/dL 7-9 years: 3.1-5.5 mg/dL 10-12 years: 3.3-5.3 mg/dL 13-15 years: 2.8-4.8 mg/dL 16-18 years: 2.5-4.8 mg/dL 19+ years: 2.2-4.6 mg/dL	0-30 days: 3.9-6.9 mg/dL 31-365 days: 3.5-6.6 mg/dL 1-3 years: 3.1-6.0 mg/dL 4-6 years: 3.3-5.8 mg/dL 7-9 years: 3.0-5.4 mg/dL 10-12 years: 3.2-5.7 mg/dL 13-15 years: 2.9-5.1 mg/dL 16-18 years: 2.7-5.9 mg/dL 19+ years: 2.2-4.6 mg/dL		Photometric	OSUWMC Reference Range Study effective 12.11.2013; verified by OSUWMC Reference Interval Study 2021. Pediatric Reference Ranges, Soldin, 1999.	1.0-20.0 mg/dL	1.0-60.0 mg/dL
Phosphorus, Random, Urine			The reference range has not been established for random urine specimens. The test result should be integrated into the clinical context for interpretation.	Photometric		10.0-200.0 mg/dL	10.0-1,000.0 mg/dL
Phosphorus, 24HR	0.4-1.3 g/24 hrs			Photometric	Clinical Guide to Laboratory Tests, Tietz, 1995		
Potassium	0-7 days: 3.2-5.5 mmol/L 8-30 days: 3.4-6.0 mmol/L 31-182 days: 3.5-5.6 mmol/L 183-365 days: 3.5-6.1 mmol/L 1-17 years: 3.3-4.6 mmol/L 18+ years: 3.5-5.0 mmol/L			Indirect ion-selective electrode	OSUWMC Reference Range Study effective 12.11.2013; verified by OSUWMC Reference Interval Study 2021. Pediatric Reference Ranges, Soldin, 1999.	1.0-10.0 mmol/L	1.0-10.0 mmol/L
Potassium Body Fluid			**Stool:** The reference range has not been established for this fluid specimen. The fluid results should be compared with the concentration in serum/plasma or integrated into the clinical context for interpretation.	Indirect ion-selective electrode		2.0-200.0 mmol/L	2.0-200.0 mmol/L
Potassium 24 HR Urine	25-125 mmol/24 hrs			Indirect ion-selective electrode	Clinical Guide to Laboratory Tests, Tietz, 1995		
Potassium, Random Urine			The reference range has not been established for random urine specimens. The test result should be integrated into the clinical context for interpretation.	Indirect ion-selective electrode	Clinical Guide to Laboratory Tests, Tietz, 1995	2.0-200.0 mmol/L	2.0-200.0 mmol/L
Prealbumin	17-34 mg/dL			Turbidimetry	Package Insert. Verified by OSUWMC Reference Interval Study 2021.	3-80 mg/dL	3-1,600 mg/dL
Procalcitonin	<0.50 ng/mL			Two-site sandwich immunoassay chemiluminescent.	Atellica IM Procalcitonin 11200767_EN Rev. 03, 2019-06	0.04-50.00 ng/mL	0.04-2,000.00 ng/mL
Progesterone			Male: 0.28-1.22 ng/mL Female: Follicular phase: 0-1.40 ng/mL Luteal phase: 1.34-25.56 ng/mL Midluteal phase: 4.44-28.03 ng/mL Postmenopausal: 0-0.73 ng/mL	Competitive immunoassay using direct chemiluminescent technology.	Atellica IM Progesterone Package Insert 11200386_EN Rev. 04-2020-06	0.21-60.00 ng/mL	0.21-3,000.00 ng/mL
Prolactin			Male: 2.1-17.7 ng/mL Female: Nonpregnant: 2.8-29.2 ng/mL Pregnant: 9.7-208.5 ng/mL Postmenopausal: 1.8-20.3 ng/mL <2 years: 3.3-14.7 ng/mL 2-5 years: 1.0-12.8 ng/mL 6-10 years: 1.2-11.4 ng/mL 11-17 years: 1.4-14.3 ng/mL	Two-site sandwich immunoassay chemiluminescent	Advia Centaur Prolactin Package Insert 111746 Rev. N, 2008-09; Pediatric Reference Intervals, 5th ed Soldin, 2005	0.3-200.0 ng/mL	0.3-800,000.0 ng/mL
Protein & Glucose, CSF	**GLU/CSF** 40-70 mg/dL **CFP** 0-3 days: 40-120 mg/dL			**GLU/CSF** Enzymatic rate with hexokinase **CFP** Colorimetric with Pyrogallol red	See individual analytes	See individual analytes	See individual analytes
Protein Total	0-30 days: 4.2-6.2 g/dL 31-182 days: 4.4-6.8 g/dL 183-365 days: 5.6-7.9 g/dL 1-18 years: 5.7-8.0 g/dL 19+ years: 6.4-8.3 g/dL	0-30 days: 4.1-6.3 g/dL 31-182 days: 4.7-6.7 g/dL 183-365 days: 5.5-7.0 g/dL 1-18 years: 5.7-8.0 g/dL 19+ years: 6.4-8.3 g/dL		Colorimetric with cupric ions in an alkaline solution	Clinical Guide to Laboratory Tests, Tietz, 1995; verified by OSUWMC Reference Interval Study 2021. Pediatric Reference Ranges, Soldin, 1999	3.0-12.0 g/dL	3.0-24.0 g/dL
Protein, CSF	0-3 days: 40-120 mg/dL			Colorimetric with Pyrogallol red	Clinical Guide to Laboratory Tests, Tietz, 1995; Pediatric Reference Ranges, Soldin, 1999	4-200 mg/dL	4-5,000 mg/dL
Protein, Fluid			**Pleural:** Pleural fluid protein to serum/plasma protein ratio > 0.5 are consistent with exudates. **Pericardial:** The reference range has not been established for this fluid specimen. The fluid results should be compared with the concentration in serum/plasma or integrated into the clinical context for interpretation. **Peritoneal/Ascites:** The reference range has not been established for this fluid specimen. The fluid results should be compared with the concentration in serum/plasma or integrated into the clinical context for interpretation.	Colorimetric with cupric ions in an alkaline solution	4th Edition of Tietz	0.5-12.0 g/dL	0.5-24.0 g/dL
Protein, 24 HR Urine	40-225 mg/24 hrs			Colorimetric with Pyrogallol red	Clinical Guide to Laboratory Tests, Tietz, 1995		
Protein, Random Urine			The reference range has not been established for random urine specimens. The test result should be integrated into the clinical context for interpretation.	Colorimetric with Pyrogallol red		4-200 mg/dL	4-5,000 mg/dL
PSA - Diagnostic/Tumor Marker	≤4.00 ng/mL			Two-site sandwich immunoassay chemiluminescent.	Atellica IM PSA Package Insert 10997799_EN Rev. 03-2019-09.	0.04-100.00 ng/mL	0.04-6,400,000.00 ng/mL
PSA, Reflex to Free and Total PSA	≥4.00 ng/mL				Atellica IM PSA Package Insert 10997799_EN Rev. 03-2019-09.	0.04-100.00 ng/mL	0.04-6,400,000.00 ng/mL
PSA, Screening	≤4.00 ng/mL			Two-site sandwich immunoassay chemiluminescent.	Atellica IM PSA Package Insert 10997799_EN Rev. 03-2019-09.	0.04-100.00 ng/mL	0.04-6,400,000.00 ng/mL
	NA 0-6 days: 133-146 mmol/L 7-30 days: 134-144 mmol/L 31-182 days: 134-142 mmol/L 183-365 days: 133-142 mmol/L 1+ years: 135-145 mmol/L **K** 0-7 days: 3.2-5.5 mmol/L 8-30 days: 3.4-6.0 mmol/L 31-182 days: 3.5-5.6 mmol/L 183-365 days: 3.5-6.1 mmol/L 1-17 years: 3.3-4.6 mmol/L 18+ years: 3.5-5.0 mmol/L **CL** 0-365 days: 98-113 mmol/L 1-17 years: 102-112 mmol/L 18+ years: 98-108 mmol/L **CO2** 0-2 years: 13-29 mmol/L 3+ years: 21-31 mmol/L	**NA** 0-6 days: 133-146 mmol/L 7-30 days: 134-144 mmol/L 31-182 days: 134-142 mmol/L 183-365 days: 133-142 mmol/L 1+ years: 135-145 mmol/L **K** 0-7 days: 3.2-5.5 mmol/L 8-30 days: 3.4-6.0 mmol/L 31-182 days: 3.5-5.6 mmol/L 183-365 days: 3.5-6.1 mmol/L 1-17 years: 3.3-4.6 mmol/L 18+ years: 3.5-5.0 mmol/L **CL** 0-365 days: 98-113 mmol/L 1-17 years: 102-112 mmol/L 18+ years: 98-108 mmol/L **CO2** 0-2 years: 13-29 mmol/L 3+ years: 21-31 mmol/L		**NA/K/CL** Indirect ion-selective electrode **CO2** Photometric **GLUC** Photometric rate with hexokinase **BUN**			

Renal Panel	**GLUC** 0-30 days: 55-115 mg/dL 31-182 days: 57-117 mg/dL 183-365 days: 70-126 mg/dL Fasting 1+ years: 70-99 mg/dL Nonfasting 1+years: 70-179 mg/dL **BUN** 7-25 mg/dL **CREA** 0-30 days: 0.50-0.90 mg/dL 31-365 days: 0.40-0.60 mg/dL 1-3 years: 0.40-0.70 mg/dL 4-6 years: 0.50-0.80 mg/dL 7-9 years: 0.50-0.90 mg/dL 10-12 years: 0.60-1.00 mg/dL 13-15 years: 0.70-1.10 mg/dL 16-18 years: 0.80-1.20 mg/dL 19+ years: 0.50-1.20 mg/dL **CA** 0-30 days: 8.4-10.6 mg/dL 31-365 days: 8.9-10.5 mg/dL 1+ years: 8.6-10.5 mg/dL **OSMO** 278-305 mOsm/kg **ANION GAP** 7-17 mmol/L **eGFR** >60 mL/min/1.73m2 **ALB** 0-30 days: 2.7-4.3 g/dL 31-182 days: 2.9-4.2 g/dL 183-365 days: 3.3-4.8 g/dL 1-19 years: 2.9-4.2 g/dL 19+ years: 3.5-5.0 g/dL **IP** 0-30 days: 4.3-7.7 mg/dL 31-365 days: 3.7-6.5 mg/dL 1-3 years: 3.4-6.0 mg/dL 4-6 years: 3.2-5.5 mg/dL 7-9 years: 3.1-5.5 mg/dL 10-12 years: 3.3-5.3 mg/dL 13-15 years: 2.8-4.8 mg/dL 16-18 years: 2.5-4.8 mg/dL 19+ years: 2.2-4.6 mg/dL	**GLUC** 0-30 days: 55-115 mg/dL 31-182 days: 57-117 mg/dL 183-365 days: 70-126 mg/dL Fasting 1+ years: 70-99 mg/dL Nonfasting 1+years: 70-179 mg/dL **BUN** 7-25 mg/dL **CREA** 0-30 days: 0.50-1.20 mg/dL 31-365 days: 0.40-0.70 mg/dL 1-3 years: 0.40-0.70 mg/dL 4-6 years: 0.50-0.80 mg/dL 7-9 years: 0.60-0.90 mg/dL 10-12 years: 0.60-1.00 mg/dL 13-15 years: 0.60-1.20 mg/dL 16-18 years: 0.80-1.40 mg/dL 19+ years: 0.70-1.30 mg/dL **CA** 0-30 days: 8.5-10.6 mg/dL 31-365 days: 8.7-10.5 mg/dL 1+ years: 8.6-10.5 mg/dL **OSMO** 278-305 mOsm/kg **ANION GAP** 7-17 mmol/L **eGFR** >60 mL/min/1.73m2 **ALB** 0-30 days: 2.6-4.1 g/dL 31-182 days: 2.8-4.6 g/dL 183-365 days: 2.8-4.8 g/dL 1-19 years: 3.2-4.7 g/dL 19+ years: 3.5-5.0 g/dL **IP** 0-30 days: 3.9-6.9 mg/dL 31-365 days: 3.5-6.6 mg/dL 1-3 years: 3.3-6.0 mg/dL 4-6 years: 3.3-5.6 mg/dL 7-9 years: 3.0-5.4 mg/dL 10-12 years: 3.2-5.7 mg/dL 13-15 years: 2.9-5.1 mg/dL 16-18 years: 2.7-4.9 mg/dL 19+ years: 2.2-4.6 mg/dL		**BUN** Photometric rate **CREA** Kinetic Jaffe **CA** Photometric, arsenazo **BC RATIO** BUN/Serum Creatinine **ANION GAP** (Na + K) – (Cl + CO2) **eGFR** eGFRcr =142 x min(Scr/κ, 1)α x max(Scr/κ, 1)-1.200 x 0.9938Age x 1.012 [if female] Where c = 0.7 (females) or 0.9 (males) κ = -0.241 (female) or -0.302 (male) Scr = serum creatinine in mg/dL; divide by 88.4 for creatinine in µmol/L Age (years) The "min(Scr/κ, 1)" factor indicates the minimum of Scr/κ or 1.0 and "max(Scr/κ, 1)" indicates the maximum of Scr/κ or 1.0. **OSMO CALC** (1.86 (Na +K) + 1.15 (Glucose/18) + (Urea/2.8) + 14 where Na and K are in mmol/L; Glucose and Urea are in mg/dL. **ALB** Colorimetric; Bromocresol green **IP** Colorimetric	See individual analytes	See individual analytes	See individual analytes
Rheumatoid Factor	≤14 IU/mL			Turbidimetry	Package Insert. Verified by OSUWMC Reference Interval Study 2021.	10-120 IU/mL	10-3,000 IU/mL
Salicylate Level	Therapeutic Range: 20.0-30.0 mg/dL			Serum is mixed with Reagent 1, which contains antibodies to salicylic acid and the coenzyme nicotinamide adenine dinucleotide (NAD). Subsequently, Reagent 2, which contains salicylic acid labeled with the enzyme glucose-6-phosphate dehydrogenase (G6PDH), is added. Salicylic acid in the sample and salicylic acid-labeled G6PDH compete for antibody binding sites. Enzyme activity decreases upon binding to the antibody, so the salicylic acid concentration in the sample can be measured in terms of enzyme activity. Active enzyme converts oxidized NAD to NADH, resulting in an absorbance change that is measured spectrophotometrically.	Applied Pharmacokinetics: Principles of Therapeutic Drug Monitoring, 2nd Edition 2002 Applied Therapeutics, Inc. and Micromedex. On OSU Intranet	5.0-80.0 mg/dL	5.0-240.0 mg/dL
Sodium	0-6 days: 133-146 mmol/L			Indirect ion-selective electrode	Verified by OSUWMC Reference Interval Study 2021.	50-200 mmol/L	50-200 mmol/L
Sodium Body Fluid			**Stool:** The reference range has not been established for this fluid specimen. The fluid results should be compared with the concentration in serum/plasma or integrated into the clinical context for interpretation.	Indirect ion-selective electrode		50-200 mmol/L	50-200 mmol/L
Sodium, Potassium, Chloride	**NA** 0-6 days: 133-146 mmol/L 7-30 days: 134-144 mmol/L 31-182 days: 134-142 mmol/L 183-365 days: 133-142 mmol/L 1+ years: 135-145 mmol/L **K** 0-7 days: 3.2-5.5 mmol/L 8-30 days: 3.4-6.0 mmol/L 31-182 days: 3.5-5.6 mmol/L 183-365 days: 3.5-6.1 mmol/L 1-17 years: 3.5-4.6 mmol/L 18+ years: 3.5-5.0 mmol/L **CL** 0-365 days: 98-113 mmol/L 1-17 years: 102-112 mmol/L 18+: 98-108 mmol/L			Indirect ion-selective electrode	See individual analytes	See individual analytes	See individual analytes
Sodium, 24 HR Urine	40-220 mmol/24 hrs			Indirect ion-selective electrode	Clinical Guide to Laboratory Tests. Tietz, 1995		
Sodium, Random Urine			The reference range has not been established for random urine specimens. The test result should be integrated into the clinical context for interpretation.	Indirect ion-selective electrode		10-400 mmol/L	10-400 mmol/L
T3 Free	0-3 days: 1.4-5.4 pg/mL 4-29 days: 1.5-5.0 pg/mL 30-365 days: 2.5-6.5 pg/mL 1-5 years: 3.0-6.0 pg/mL 6-10 years: 2.7-6.2 pg/mL 11-15 years: 2.6-5.7 pg/mL 16-18 years: 2.8-5.2 pg/mL 19+ years: 2.3-4.2 pg/mL	0-3 days: 1.4-4.8 pg/mL 4-29 days: 1.4-5.5 pg/mL 30-365 days: 2.0-6.9 pg/mL 1-5 years: 2.4-6.7 pg/mL 6-10 years: 2.9-6.0 pg/mL 11-15 years: 3.1-5.9 pg/mL 16-18 years: 3.5-5.7 pg/mL 19+ years: 2.3-4.2 pg/mL		Competitive immunoassay using direct chemiluminescent technology.	Atellica IM Free T3 Package Insert 10995347_EN Rev. 03-2020-06	0.2-20.0 pg/mL	0.2-20.0 pg/mL
T3 Total (Triiodothyronine)	0-29 days: 0.48-1.77 ng/mL 30-365 days: 0.73-2.21 ng/mL 1-5 years: 1.26-2.16 ng/mL 6-10 years: 1.10-1.95 ng/mL 11-15 years: 1.04-1.84 ng/mL 16-18 years: 1.01-1.51 ng/mL 19+ years: 0.60-1.81 ng/mL	0-29 days: 0.51-1.84 ng/mL 30-365 days: 1.03-2.29 ng/mL 1-5 years: 0.93-2.13 ng/mL 6-10 years: 1.04-1.98 ng/mL 11-15 years: 0.88-1.76 ng/mL 16-18 years: 0.86-1.78 ng/mL 19+ years: 0.60-1.81 ng/mL		Competitive immunoassay using direct chemiluminescent technology.	Atellica IM Total T3 Package Insert 10995424_EN Rev. 03-2020-06	0.10-8.00 ng/mL	0.10-80.00 ng/mL
T4	0-29 days: 3.4-11.8 mcg/dL 30-365 days: 4.7-11.8 mcg/dL 1-5 years: 6.0-11.3 mcg/dL 6-10 years: 5.2-9.7 mcg/dL 11-15 years: 4.9-9.0 mcg/dL 16-18 years: 5.1-9.0 mcg/dL 19+ years: 4.5-10.9 mcg/dL	0-29 days: 3.4-12.6 mcg/dL 30-365 days: 5.4-14.1 mcg/dL 1-5 years: 5.3-10.2 mcg/dL 6-10 years: 5.3-9.5 mcg/dL 11-15 years: 4.6-9.2 mcg/dL 16-18 years: 4.9-8.1 mcg/dL 19+ years: 4.5-10.9 mcg/dL		Competitive immunoassay using direct chemiluminescent technology.	Atellica IM Total T4 Package Insert 10995425_EN Rev. 03-2020-069; Pediatric Reference Ranges, Soldin, 1999	0.4-30.0 mcg/dL	0.4-300.0 mcg/dL
T4 Free	0-18 years: 1.04-1.64 ng/dL 19+ years: 0.89-1.76 ng/dL			Competitive immunoassay using direct chemiluminescent technology.	Atellica IM Free T4 Package Insert 10995348_EN Rev. 06-2020-11; Pediatric Reference Ranges, Soldin, 1999	0.10-12.00 ng/dL	0.10-12.00 ng/dL
Testosterone	19+ years: 8-60 ng/dL	19+ years: 240-950 ng/dL		Competitive immunoassay using direct chemiluminescent technology.	Siemens Atellica IM Reference Interval Verification Study 2023	7-1,500 ng/dL	7-3,000 ng/dL
Testosterone Total and Free, Includes SHBG	**TESTOS** 19+ years: 8-60 ng/dL **SHGB** 18.00-144.00 nmol/L **FREE TESTOS** 0-365 days: ≤0.25 ng/dL 1-6 years: <0.13 ng/dL 7-8 years: ≤0.23 ng/dL 9-9 years: ≤0.34 ng/dL 9-10 years: ≤0.46 ng/dL 10-11 years: ≤0.59 ng/dL 11-12 years: ≤0.72 ng/dL 12-13 years: ≤0.84 ng/dL 13-14 years: ≤0.96 ng/dL 14-15 years: ≤1.06 ng/dL 15-18 years: ≤1.09 ng/dL 19+ years: 0.00-1.08 ng/dL	**TESTOS** 19+ years: 240-950 ng/dL **SHGB** 10.00-57.00 nmol/L **FREE TESTOS** 0-365 days: 0.20-3.10 ng/dL 1-8 years: <0.13 ng/dL 9-10 years: ≤0.45 ng/dL 10-11 years: ≤1.26 ng/dL 11-12 years: ≤3.52 ng/dL 12-13 years: ≤9.28 ng/dL 13-14 years: ≤12.60 ng/dL 14-15 years: 0.48-15.30 ng/dL 15-16 years: 1.62-17.70 ng/dL 16-17 years: 2.93-19.50 ng/dL 17-18 years: 4.28-20.90 ng/dL 18-19 years: 5.40-21.80 ng/dL 19+ years: 2.29-20.70 ng/dL			See individual analytes	See individual analytes	See individual analytes
Theophylline Level	Therapeutic Range: 5.0-20.0 mcg/mL			Based on competition between drug in the sample and drug labeled with the enzyme glucose-6-phosphate dehydrogenase (G6PDH) for antibody binding sites. Enzyme activity decreases upon binding to the antibody, so the drug concentration in the sample can be measured in terms of enzyme activity. Active enzyme converts oxidized nicotinamide adenine dinucleotide (NAD) to NADH, resulting in an absorbance change that is measured spectrophotometrically.	Applied Clinical Pharmacokinetics, 2001	2.5-40.0 mcg/mL	2.5-200.0 mcg/mL

Tobramycin Level, Extended Interval	Peak: 10.0 - 15.0 mcg/mL, Trough: <1.0 mcg/mL			This assay is based on competition for antibody binding sites between drug in the sample and drug labeled with the enzyme glucose-6-phosphate dehydrogenase (G6PDH). Enzyme activity decreases upon binding to the antibody, so the drug concentration in the sample can be measured in terms of enzyme activity. Active enzyme converts oxidized nicotinamide adenine dinucleotide (NAD) to NADH, resulting in an absorbance change that is measured spectrophotometrically.	Antimicrobial Stewardship Program, 2013	0.6-10.0 mcg/mL	0.6-50.0 mcg/mL
Tobramycin Level, Peak (Post Drug Level)	Therapeutic Range: 10.0-15.0 mcg/mL			This assay is based on competition for antibody binding sites between drug in the sample and drug labeled with the enzyme glucose-6-phosphate dehydrogenase (G6PDH). Enzyme activity decreases upon binding to the antibody, so the drug concentration in the sample can be measured in terms of enzyme activity. Active enzyme converts oxidized nicotinamide adenine dinucleotide (NAD) to NADH, resulting in an absorbance change that is measured spectrophotometrically.	Antimicrobial Stewardship Program, 2013	0.6-10.0 mcg/mL	0.6-50.0 mcg/mL
Tobramycin Level, Random	Peak: 10.0 - 15.0 mcg/mL, Trough: <1.0 mcg/mL			This assay is based on competition for antibody binding sites between drug in the sample and drug labeled with the enzyme glucose-6-phosphate dehydrogenase (G6PDH). Enzyme activity decreases upon binding to the antibody, so the drug concentration in the sample can be measured in terms of enzyme activity. Active enzyme converts oxidized nicotinamide adenine dinucleotide (NAD) to NADH, resulting in an absorbance change that is measured spectrophotometrically.	Antimicrobial Stewardship Program, 2013	0.6-10.0 mcg/mL	0.6-50.0 mcg/mL
Tobramycin Level, Trough (Pre Drug Level)	Therapeutic Range: <1.0 mcg/mL			This assay is based on competition for antibody binding sites between drug in the sample and drug labeled with the enzyme glucose-6-phosphate dehydrogenase (G6PDH). Enzyme activity decreases upon binding to the antibody, so the drug concentration in the sample can be measured in terms of enzyme activity. Active enzyme converts oxidized nicotinamide adenine dinucleotide (NAD) to NADH, resulting in an absorbance change that is measured spectrophotometrically.	Antimicrobial Stewardship Program, 2013	0.6-10.0 mcg/mL	0.6-50.0 mcg/mL
Transferrin/Iron Binding	**TRAN** 200-400 mg/dL **TIBC** 0-30 days: 94-236 mcg/dL 31-182 days: 89-311 mcg/dL 183-365 days: 138-365 mcg/dL 1-3 years: 184-377 mcg/dL 4-6 years: 162-352 mcg/dL 7-9 years: 167-336 mcg/dL 10-12 years: 198-383 mcg/dL 13-15 years: 169-358 mcg/dL 16-18 years: 194-372 mcg/dL 19+ years: 250-425 mcg/dL	**TRAN** 200-400 mg/dL **TIBC** 0-30 days: 94-252 mcg/dL 31-182 days: 116-322 mcg/dL 183-365 days: 176-384 mcg/dL 1-3 years: 204-382 mcg/dL 4-6 years: 180-390 mcg/dL 7-9 years: 183-369 mcg/dL 10-12 years: 173-356 mcg/dL 13-15 years: 193-377 mcg/dL 16-18 years: 174-351 mcg/dL 19+ years: 250-425 mcg/dL			Clinical Guide to Laboratory Tests, Tietz, 1995; Pediatric Reference Ranges, Soldin, 1999	TRANSFERRIN: 75-750 mg/dL IRON: 10-1,000 mcg/dL	TRANSFERRIN: 75-2,250 mg/dL IRON: 10-2,000 mcg/dL
Triglyceride	0-3 years: 27-125 mg/dL 4-6 years: 32-116 mg/dL 7-9 years: 28-129 mg/dL 10-11 years: 39-140 mg/dL 12-13 years: 37-130 mg/dL 14-15 years: 38-135 mg/dL 16-19 years: 37-140 mg/dL 20+ years: <150 mg/dL	0-3 years: 27-125 mg/dL 4-6 years: 32-116 mg/dL 7-9 years: 28-129 mg/dL 10-11 years: 24-137 mg/dL 12-13 years: 24-145 mg/dL 14-15 years: 34-165 mg/dL 16-19 years: 34-140 mg/dL 20+ years: <150 mg/dL		Enzymatic colorimetric	National Cholesterol Education Project (NCEP) Adult Treatment Protocol (ATP- III) (Circulation, 2002;106:3143-3421)	10-1,000 mg/dL	10-10,000 mg/dL
Triglyceride Body Fluid			**Pleural:** Pleural triglycerides <50 mg/dL excludes a chylothorax. Pleural triglycerides >110mg/dL supports a diagnosis of a chylothorax. **Peritoneal/Ascites:** Peritoneal fluid triglyceride values greater than 110 mg/dL have been suggested for diagnosis of chylous ascites. Measurement may also be useful in distinguishing cirrhotic versus malignant origins. **Drainage:** The reference range has not been established for this fluid specimen. The fluid results should be compared with the concentration in serum/plasma or integrated into the clinical context for interpretation.	Enzymatic colorimetric	Pleural: Staats BA, et al. Mayo Clin Proc. 1980;55(11):700. Peritoneal: Jüngst D, et al. Hepatology. 1986;6(2):239.	10-1,000 mg/dL	10-10,000 mg/dL
TSH	0-7 days: 0.847-17.089 uIU/mL 7 days-1 month: 0.847-12.577 uIU/mL 1 month-1 year: 0.580-8.195 uIU/mL 1-10 years: 0.461-5.488 uIU/mL 11-19 years: 0.203-4.843 uIU/mL 19+ years: 0.550-4.780 uIU/mL			The Atellica IM TSH3-UL assay is a third-generation assay that employs FITC-labeled mouse monoclonal anti-TSH antibody and mouse monoclonal anti-fluorescein antibody linked to paramagnetic particles, an FITC-labeled anti-TSH capture mouse monoclonal antibody, and a tracer consisting of a proprietary acridinium ester and an anti-TSH mouse monoclonal antibody conjugated to bovine serum albumin (BSA) for chemiluminescent detection.	Atellica IM TSH3-UL Package Insert 11376245_EN Rev. 01, 2024-04.	0.010-150.000 uIU/mL	0.010-150.000 uIU/mL
TSH w/ FT4 Reflex	0-7 days: 0.847-17.089 uIU/mL 7 days-1 month: 0.847-12.577 uIU/mL 1 month-1 year: 0.580-8.195 uIU/mL 1-10 years: 0.461-5.488 uIU/mL 11-19 years: 0.203-4.843 uIU/mL 19+ years: 0.550-4.780 uIU/mL			The Atellica IM TSH3-UL assay is a third-generation assay that employs FITC-labeled mouse monoclonal anti-TSH antibody and mouse monoclonal anti-fluorescein antibody linked to paramagnetic particles, an FITC-labeled anti-TSH capture mouse monoclonal antibody, and a tracer consisting of a proprietary acridinium ester and an anti-TSH mouse monoclonal antibody conjugated to bovine serum albumin (BSA) for chemiluminescent detection.	See individual analytes	See individual analytes	See individual analytes
Urea Nitrogen, 24 HR Urine	10.0-20.0 g/24 hrs			Photometric rate	Clinical Guide to Laboratory Tests, Tietz, 1995		
Uric Acid	0-30 days: 1.0-4.6 mg/dL 31-365 days: 1.1-5.4 mg/dL 1-3 years: 1.8-5.0 mg/dL 4-6 years: 2.0-5.1 mg/dL 7-9 years: 1.8-5.5 mg/dL 10-12 years: 2.5-5.9 mg/dL 13-15 years: 2.2-6.4 mg/dL 16-18 years: 2.4-6.6 mg/dL 19+ years: 2.8-6.0 mg/dL	0-30 days: 1.2-3.9 mg/dL 31-365 days: 1.2-5.6 mg/dL 1-3 years: 2.1-5.6 mg/dL 4-6 years: 1.8-5.5 mg/dL 7-9 years: 1.8-5.4 mg/dL 10-12 years: 2.2-5.8 mg/dL 13-15 years: 3.1-7.0 mg/dL 16-18 years: 2.1-7.6 mg/dL 19+ years: 3.5-7.0 mg/dL		Enzymatic colorimetric	OSUWMC Reference Range Study effective 12.11.2013; verified by OSUWMC Reference Interval Study 2021. Pediatric Reference Ranges, Soldin, 1999.	1.5-30.0 mg/dL	1.5-60.0 mg/dL
Uric Acid (Special Handling)	0-30 days: 1.0-4.6 mg/dL 31-365 days: 1.1-5.4 mg/dL 1-3 years: 1.8-5.0 mg/dL 4-6 years: 2.0-5.1 mg/dL 7-9 years: 1.8-5.5 mg/dL 10-12 years: 2.5-5.9 mg/dL 13-15 years: 2.2-6.4 mg/dL 16-18 years: 2.4-6.6 mg/dL 19+ years: 2.8-6.0 mg/dL	0-30 days: 1.2-3.9 mg/dL 31-365 days: 1.2-5.6 mg/dL 1-3 years: 2.1-5.6 mg/dL 4-6 years: 1.8-5.5 mg/dL 7-9 years: 1.8-5.4 mg/dL 10-12 years: 2.2-5.8 mg/dL 13-15 years: 3.1-7.0 mg/dL 16-18 years: 2.1-7.6 mg/dL 19+ years: 3.5-7.0 mg/dL		Enzymatic colorimetric	OSUWMC Reference Range Study effective 12.11.2013; Pediatric Reference Ranges, Soldin, 1999.	1.5-30.0 mg/dL	1.5-60.0 mg/dL
Uric Acid, 24HR	0.3-4.8 g/24 hrs			Enzymatic colorimetric	Clinical Guide to Laboratory Tests, Tietz, 1995		
Uric Acid, Random, Urine			The reference range has not been established for random urine specimens. The test result should be integrated into the clinical context for interpretation.	Enzymatic colorimetric		1.0-100.0 mg/dL	1.0-300.0 mg/dL
Urine Protein/Creat Ratio, Random				**UCRE** Kinetic Jaffe **UPRO** Colorimetric with Pyrogallol red	See individual analytes	See individual analytes	See individual analytes
Urine Protein/Creat Ratio, 24HR	**UCRE** 0-2 years: 0.70-2.00 g/24 hrs 3-8 years: 0.11-0.68 g/24 hrs 9-12 years: 0.17-1.41 g/24 hrs 13-17 years: 0.29-1.87 g/24 hrs 18+ years: 0.60-1.80 g/24 hrs **UPRO** 40-225 mg/24 hrs	**UCRE** 0-2 years: 0.70-2.00 g/24 hrs 3-8 years: 0.11-0.68 g/24 hrs 9-12 years: 0.17-1.41 g/24 hrs 13-17 years: 0.29-1.87 g/24 hrs 18+ years: 0.80-2.00 g/24 hrs **UPRO** 40-225 mg/24 hrs		**UCRE** Kinetic Jaffe **UPRO** Colorimetric with Pyrogallol red	See individual analytes	See individual analytes	See individual analytes
Urine Urea Nitrogen - Random			The reference range has not been established for random urine specimens. The test result should be integrated into the clinical context for interpretation.	Photometric rate	Clinical Guide to Laboratory Tests, Tietz, 1995	20-1,300 mg/dL	20-13,000 mg/dL
Vancomycin Level, Continuous Infusion (aka Random)	20.0-25.0 mcg/mL			Serum or plasma is mixed with Reagent 1, which contains vancomycin labeled with the enzyme glucose-6-phosphate dehydrogenase (G6PDH). Subsequently, Reagent 2, which contains antibodies to vancomycin and the coenzyme nicotinamide adenine dinucleotide (NAD), is added. Vancomycin in the sample and vancomycin-labeled G6PDH compete for antibody binding sites. Enzyme activity decreases upon binding to the antibody, so the vancomycin concentration in the sample can be measured in terms of enzyme activity. Active enzyme converts oxidized NAD to NADH, resulting in an absorbance change that is measured spectrophotometrically.	American Journal of Health-System Pharmacy, Volume 77, Issue 11, 1 June 2020, Pages 835-864	2.0-50.0 mcg/mL	2.0-250.0 mcg/mL

Vancomycin Level, Random	Peak: 20.0-40.0 mcg/mL Trough: 10.0-20.0 mcg/mL		Serum or plasma is mixed with Reagent 1, which contains vancomycin labeled with the enzyme glucose-6-phosphate dehydrogenase (G6PDH). Subsequently, Reagent 2, which contains antibodies to vancomycin and the coenzyme nicotinamide adenine dinucleotide (NAD), is added. Vancomycin in the sample and vancomycin-labeled G6PDH compete for antibody binding sites. Enzyme activity decreases upon binding to the antibody, so the vancomycin concentration in the sample can be measured in terms of enzyme activity. Active enzyme converts oxidized NAD to NADH, resulting in an absorbance change that is measured spectrophotometrically.	Applied Clinical Pharmacokinetics, 2001 Clinical Pharmacotherapy, 1995; 15:85-91	2.0-50.0 mcg/mL	2.0-250.0 mcg/mL
Vancomycin Level, Trough (Pre Drug Level)	Therapeutic Range: 10.0-20.0 mcg/mL		Serum or plasma is mixed with Reagent 1, which contains vancomycin labeled with the enzyme glucose-6-phosphate dehydrogenase (G6PDH). Subsequently, Reagent 2, which contains antibodies to vancomycin and the coenzyme nicotinamide adenine dinucleotide (NAD), is added. Vancomycin in the sample and vancomycin-labeled G6PDH compete for antibody binding sites. Enzyme activity decreases upon binding to the antibody, so the vancomycin concentration in the sample can be measured in terms of enzyme activity. Active enzyme converts oxidized NAD to NADH, resulting in an absorbance change that is measured spectrophotometrically.	Applied Clinical Pharmacokinetics, 2001 Clinical Pharmacotherapy, 1995; 15:85-91	2.0-50.0 mcg/mL	2.0-250.0 mcg/mL
Vancomycin, Peak (Post Drug Level)	Therapeutic Range: 20.0-40.0 mcg/mL		Serum or plasma is mixed with Reagent 1, which contains vancomycin labeled with the enzyme glucose-6-phosphate dehydrogenase (G6PDH). Subsequently, Reagent 2, which contains antibodies to vancomycin and the coenzyme nicotinamide adenine dinucleotide (NAD), is added. Vancomycin in the sample and vancomycin-labeled G6PDH compete for antibody binding sites. Enzyme activity decreases upon binding to the antibody, so the vancomycin concentration in the sample can be measured in terms of enzyme activity. Active enzyme converts oxidized NAD to NADH, resulting in an absorbance change that is measured spectrophotometrically.	Applied Clinical Pharmacokinetics, 2001 Clinical Pharmacotherapy, 1995; 15:85-91	2.0-50.0 mcg/mL	2.0-250.0 mcg/mL
Vitamin B12	0-4 years: ≥213 pg/mL 5-9 years: 343-1,184 pg/mL 10-14 years: 298-955 pg/mL 15-18 years: 238-787 pg/mL 19+ years: 211-911 pg/mL		Competitive immunoassay using direct chemiluminescent technology.	Atellica IM Vitamin B12 Package Insert 10995437_EN Rev. 02-2019-08; Pediatric Reference Ranges, Soldin, 1999	45-2,000 pg/mL	45-20,000 pg/mL
Acanthocytes			Manual			
Bone Marrow, Basic (ASP, BX, FE)			Manual			
CBC, EDIF, Platelet	See HEM3 and INPT209		The Sysmex XN performs hematology analysis according to the hydrodynamic focusing (DC detection), flow cytometry method (semiconductor laser), and sodium lauryl sulfate (SLS)-hemoglobin method.	OSU Internal Normal Range Study, October 2018 Soldin, Steven J. *Pediatric Reference Intervals*. 7th ed., AACC Press, 2011.	See HEM3 and INPT209	See HEM3 and INPT209
CBC, Platelets	**WBC** 0-14 days: 8.16-14.56 K/uL 15-30 days: 8.36-14.42 K/uL 31-60 days: 7.05-14.68 K/uL 61-179 days: 6.00-13.25 K/uL 180 days-2 years: 6.48-13.02 K/uL 2-5 years: 4.86-13.18 K/uL 6-11 years: 4.27-11.40 K/uL 12-17 years: 4.19-9.43 K/uL 18+ years: 3.99-11.19 K/uL **RBC** 0-14 days: 4.12-5.74 M/uL 15-30 days: 3.32-4.80 M/uL 31-60 days: 2.93-3.87 M/uL 61-179 days: 3.45-4.75 M/uL 180 days-2 years: 3.97-5.01 M/uL 2-5 years: 3.84-4.92 M/uL 6-11 years: 3.90-4.96 M/uL 12-17 years: 3.93-4.90 M/uL 18+ years: 3.91-5.04 M/uL **HGB** 0-7 days: 13.4-20.0 g/dL 8-14 days: 13.4-20.0 g/dL 15-30 days: 10.8-14.6 g/dL 31-60 days: 9.2-11.4 g/dL 61-179 days: 9.9-12.4 g/dL 180 days-2 years: 10.2-12.7 g/dL 2-5 years: 10.2-12.7 g/dL 6-11 years: 10.6-13.2 g/dL 12-17 years: 10.8-13.3 g/dL 18+ years: 11.4-15.2 g/dL **HCT** 0-14 days: 39.6-57.2 % 15-30 days: 32.0-44.5 % 31-60 days: 27.7-35.1 % 61-179 days: 29.5-37.1 % 180 days-2 years: 30.9-37.9 % 2-5 years: 31.2-37.8 % 6-11 years: 32.4-39.5 % 12-17 years: 33.4-40.4 % 18+ years: 34.9-44.1 % **MCV** 0-14 days: 92.7-106.4 fL 15-30 days: 90.1-103.0 fL 31-60 days: 83.4-96.4 fL 61-179 days: 74.8-88.3 fL 180 days-2 years: 71.3-82.6 fL 2-5 years: 72.3-85.0 fL 6-11 years: 75.9-87.6 fL 12-17 years: 76.9-90.6 fL 18+ years: 79.6-97.7 fL **MCH** 0-14 days: 31.1-35.9 pg 15-30 days: 30.4-35.3 pg 31-60 days: 28.0-32.5 pg 61-179 days: 24.4-29.5 pg 180 days-2 years: 23.2-27.5 pg 2-5 years: 23.7-28.6 pg 6-11 years: 24.8-29.5 pg 12-17 years: 24.8-30.2 pg 18+ years: 25.9-33.9 pg **MCHC** 0-14 days: 33.4-35.4 g/dL 15-30 days: 33.2-35.0 g/dL 31-60 days: 32.5-34.9 g/dL 61-179 days: 32.1-34.4 g/dL 180 days-2 years: 31.9-34.2 g/dL 2-5 years: 31.8-34.6 g/dL 6-11 years: 31.8-34.6 g/dL 12-17 years: 31.5-34.2 g/dL 18+ years: 31.4-35.9 g/dL **RDW** 0-14 days: 14.6-17.3 % 15-30 days: 14.4-16.2 % 31-60 days: 13.6-15.8 % 61-179 days: 12.2-14.3 % 180 days-2 years: 12.7-15.1 % 2-5 years: 12.4-14.9 % 6-11 years: 12.2-14.4 % 12-17 years: 12.3-14.6 % 18+ years: 10.8-14.9 %	**WBC** 0-14 days: 8.04-15.40 K/uL 15-30 days: 7.80-15.91 K/uL 31-60 days: 8.14-14.99 K/uL 61-179 days: 6.51-13.32 K/uL 180 days-2 years: 5.98-13.51 K/uL 2-5 years: 5.14-13.38 K/uL 6-11 years: 4.31-11.00 K/uL 12-17 years: 3.84-9.84 K/uL 18+ years: 3.73-10.10 K/uL **RBC** 0-14 days: 4.10-5.55 M/uL 15-30 days: 3.16-4.63 M/uL 31-60 days: 3.02-4.22 M/uL 61-179 days: 3.43-4.80 M/uL 180 days-2 years: 4.03-5.07 M/uL 2-5 years: 3.89-4.97 M/uL 6-11 years: 3.96-5.03 M/uL 12-17 years: 4.05-5.29 M/uL 18+ years: 4.38-5.83 M/uL **HGB** 0-7 days: 13.9-19.1 g/dL 8-14 days: 13.9-19.1 g/dL 15-30 days: 10.0-15.3 g/dL 31-60 days: 8.9-12.7 g/dL 61-179 days: 9.6-12.4 g/dL 180 days-2 years: 10.1-12.5 g/dL 2-5 years: 10.2-12.7 g/dL 6-11 years: 10.7-13.4 g/dL 12-17 years: 11.0-14.5 g/dL 18+ years: 13.4-16.8 g/dL **HCT** 0-14 days: 39.8-53.6 % 15-30 days: 30.5-45.0 % 31-60 days: 26.8-37.5 % 61-179 days: 28.6-37.2 % 180 days-2 years: 30.0-37.8 % 2-5 years: 31.0-37.7 % 6-11 years: 32.2-39.8 % 12-17 years: 33.9-43.5 % 18+ years: 39.6-48.8 % **MCV** 0-14 days: 91.3-103.1 fL 15-30 days: 89.4-99.7 fL 31-60 days: 84.3-94.2 fL 61-179 days: 74.1-87.5 fL 180 days-2 years: 69.5-81.7 fL 2-5 years: 71.3-84.0 fL 6-11 years: 74.4-86.1 fL 12-17 years: 76.7-89.2 fL 18+ years: 79.0-94.5 fL **MCH** 0-14 days: 31.3-35.6 pg 15-30 days: 29.9-34.1 pg 31-60 days: 27.8-32.0 pg 61-179 days: 24.4-28.9 pg 180 days-2 years: 22.7-27.2 pg 2-5 years: 23.7-28.3 pg 6-11 years: 24.9-29.2 pg 12-17 years: 25.2-30.2 pg 18+ years: 26.1-33.3 pg **MCHC** 0-14 days: 33.0-35.7 g/dL 15-30 days: 32.7-35.1 g/dL 31-60 days: 32.3-34.8 g/dL 61-179 days: 31.9-34.4 g/dL 180 days-2 years: 31.6-34.4 g/dL 2-5 years: 32.0-34.7 g/dL 6-11 years: 32.2-34.9 g/dL 12-17 years: 31.8-34.8 g/dL 18+ years: 31.9-36.5 g/dL **RDW** 0-14 days: 14.8-17.0 % 15-30 days: 14.3-16.8 % 31-60 days: 13.8-16.1 % 61-179 days: 12.4-15.3 % 180 days-2 years: 12.9-15.6 % 2-5 years: 12.5-14.9 % 6-11 years: 12.3-14.1 % 12-17 years: 12.4-14.5 % 18+ years: 10.9-14.3 %	The Sysmex XN performs hematology analysis according to the hydrodynamic focusing (DC detection), flow cytometry method (semiconductor laser), and sodium lauryl sulfate (SLS)-hemoglobin method.	OSU Internal Normal Range Study, October 2018 Soldin, Steven J. *Pediatric Reference Intervals*. 7th ed., AACC Press, 2011.	WBC: 0.30-440.00 K/uL RBC: 0.05-8.60 M/uL HGB: See individual analyte HCT: See individual analyte PLT: See individual analyte	WBC: 0.30 K/uL-dilate to endpoint RBC: 0.05 M/uL-dilate to endpoint HGB: See individual analyte HCT: See individual analyte PLT: See individual analyte

	PLT 0-14 days: 144-449 K/uL 15-30 days: 279-571 K/uL 31-60 days: 331-597 K/uL 61-179 days: 247-580 K/uL 180 days-2 years: 214-459 K/uL 2-5 years: 189-394 K/uL 6-11 years: 199-367 K/uL 12-17 years: 194-345 K/uL 18+ years: 150-393 K/uL **MPV** 0-14 days: 10.4-12.0 fL 15-30 days: 10.0-12.2 fL 31-60 days: 9.4-11.1 fL 61-179 days: 9.0-10.9 fL 180 days-2 years: 8.8-10.6 fL 2-5 years: 8.9-11.0 fL 6-11 years: 9.3-11.3 fL 12-17 years: 9.6-11.7 fL 18+ years: 8.5-12.2 fL	**PLT** 0-14 days: 218-419 K/uL 15-30 days: 248-586 K/uL 31-60 days: 229-562 K/uL 61-179 days: 244-529 K/uL 180 days-2 years: 206-445 K/uL 2-5 years: 202-403 K/uL 6-11 years: 206-369 K/uL 12-17 years: 175-332 K/uL 18+ years: 146-337 K/uL **MPV** 0-14 days: 10.2-11.9 fL 15-30 days: 10.1-12.1 fL 31-60 days: 9.2-10.8 fL 61-179 days: 8.9-10.6 fL 180 days-2 years: 8.7-10.5 fL 2-5 years: 9.0-10.9 fL 6-11 years: 9.2-11.4 fL 12-17 years: 9.6-11.8 fL 18+ years: 8.7-12.3 fL					
Clumpel Platelet, Citrated Draw	0-14 days: 144-449 K/uL 15-30 days: 279-571 K/uL 31-60 days: 331-597 K/uL 61-179 days: 247-580 K/uL 180 days-2 years: 214-459 K/uL 2-5 years: 189-394 K/uL 6-11 years: 199-367 K/uL 12-17 years: 194-345 K/uL 18+ years: 150-393 K/uL	0-14 days: 218-419 K/uL 15-30 days: 248-586 K/uL 31-60 days: 229-562 K/uL 61-179 days: 244-529 K/uL 180 days-2 years: 206-445 K/uL 2-5 years: 202-403 K/uL 6-11 years: 206-369 K/uL 12-17 years: 175-332 K/uL 18+ years: 146-337 K/uL		Electronic resistance detection and flow cytometry.	OSU Internal Normal Range Study, October 2018 Soldin, Steven J. *Pediatric Reference Intervals* . 7th ed., AACC Press, 2011.	5-5,000 K/uL	≥5 K/uL
Electronic Diff	**NRBC** 0-3 days: 0.1-8.3 /100 WBC 4 days – 17 years: <0.0 /100 WBC 18+ years: ≤0.2 /100 WBC **SEG+BANDABS** 0-14 days: 1.73-6.75 K/uL 15-30 days: 1.23-4.80 K/uL 31-60 days: 1.00-4.68 K/uL 61-179 days: 1.04-7.20 K/uL 180 days-2 years: 1.27-7.18 K/uL 2-5 years: 1.60-8.29 K/uL 6-11 years: 1.64-7.87 K/uL 12-17 years: 1.82-7.47 K/uL 18+ years: 1.64-7.26 K/uL **LYMPHABS** 0-14 days: 1.75-8.00 K/uL 15-30 days: 2.42-9.20 K/uL 31-60 days: 2.29-9.14 K/uL 61-179 days: 2.14-8.99 K/uL 180 days-2 years: 1.52-8.09 K/uL 2-5 years: 1.25-5.77 K/uL 6-11 years: 1.16-4.28 K/uL 12-17 years: 1.16-3.33 K/uL 18+ years: 1.16-3.51 K/uL **MONOABS** 0-14 days: 0.57-1.72 K/uL 15-30 days: 0.42-1.21 K/uL 31-60 days: 0.28-1.21 K/uL 61-179 days: 0.24-1.17 K/uL 180 days-2 years: 0.26-1.08 K/uL 2-5 years: 0.24-0.92 K/uL 6-11 years: 0.19-0.81 K/uL 12-17 years: 0.19-0.72 K/uL 18+ years: 0.22-0.87 K/uL **EOSABS** 0-14 days: 0.09-0.64 K/uL 15-30 days: 0.06-0.75 K/uL 31-60 days: 0.04-0.63 K/uL 61-179 days: 0.02-0.74 K/uL 180 days-2 years: 0.02-0.58 K/uL 2-5 years: 0.03-0.46 K/uL 6-11 years: 0.03-0.47 K/uL 12-17 years: 0.02-0.32 K/uL 18+ years: 0.08-0.42 K/uL **BASOABS** 0-14 days: 0.02-0.07 K/uL 15-30 days: 0.01-0.06 K/uL 31-60 days: 0.01-0.05 K/uL 61-179 days: 0.01-0.07 K/uL 180 days-2 years: 0.01-0.06 K/uL 2-5 years: 0.01-0.06 K/uL 6-11 years: 0.01-0.05 K/uL 12-17 years: 0.01-0.05 K/uL 18+ years: 0.00-0.15 K/uL **IGREABS** 0-1 days: ≤0.28 K/uL 2-13 days: ≤0.27 K/uL 14-30 days: ≤0.22 K/uL 31-90 days: ≤0.09 K/uL 91-180 days: ≤0.06 K/uL 181 days-2 years: ≤0.14 K/uL 2-5 years: ≤0.06 K/uL 6-11 years: ≤0.04 K/uL 12-17 years: ≤0.04 K/uL 18+ years: ≤0.08 K/uL	**NRBC** 0-3 days: 0.1-8.3 /100 WBC 4 days – 17 years: <0.0 /100 WBC 18+ years: ≤0.2 /100 WBC **SEG+BANDABS** 0-14 days: 1.60-6.06 K/uL 15-30 days: 1.18-5.45 K/uL 31-60 days: 0.83-4.23 K/uL 61-179 days: 0.97-5.43 K/uL 180 days-2 years: 1.19-7.21 K/uL 2-5 years: 1.54-7.92 K/uL 6-11 years: 1.63-7.55 K/uL 12-17 years: 1.54-7.04 K/uL 18+ years: 1.57-6.19 K/uL **LYMPHABS** 0-14 days: 2.07-7.53 K/uL 15-30 days: 2.11-8.38 K/uL 31-60 days: 2.47-7.95 K/uL 61-179 days: 2.45-8.89 K/uL 180 days-2 years: 1.56-7.83 K/uL 2-5 years: 1.13-5.52 K/uL 6-11 years: 0.97-3.96 K/uL 12-17 years: 0.97-3.26 K/uL 18+ years: 0.83-3.57 K/uL **MONOABS** 0-14 days: 0.52-1.77 K/uL 15-30 days: 0.28-1.38 K/uL 31-60 days: 0.28-1.05 K/uL 61-179 days: 0.28-1.07 K/uL 180 days-2 years: 0.25-1.15 K/uL 2-5 years: 0.19-0.94 K/uL 6-11 years: 0.19-0.85 K/uL 12-17 years: 0.18-0.78 K/uL 18+ years: 0.24-0.93 K/uL **EOSABS** 0-14 days: 0.12-0.66 K/uL 15-30 days: 0.08-0.80 K/uL 31-60 days: 0.05-0.57 K/uL 61-179 days: 0.03-0.61 K/uL 180 days-2 years: 0.02-0.82 K/uL 2-5 years: 0.03-0.53 K/uL 6-11 years: 0.03-0.52 K/uL 12-17 years: 0.04-0.38 K/uL 18+ years: 0.04-0.48 K/uL **BASOABS** 0-14 days: 0.02-0.11 K/uL 15-30 days: 0.01-0.07 K/uL 31-60 days: 0.01-0.07 K/uL 61-179 days: 0.01-0.06 K/uL 180 days-2 years: 0.01-0.06 K/uL 2-5 years: 0.01-0.06 K/uL 6-11 years: 0.01-0.06 K/uL 12-17 years: 0.01-0.05 K/uL 18+ years: 0.00-0.09 K/uL **IGREABS** 0-1 days: ≤0.28 K/uL 2-13 days: ≤0.27 K/uL 14-30 days: ≤0.22 K/uL 31-90 days: ≤0.09 K/uL 91-180days: ≤0.06 K/uL 181 days-2 years: ≤0.14 K/uL 2-5 years: ≤0.06 K/uL 6-11 years: ≤0.04 K/uL 12-17 years: ≤0.04 K/uL 18+ years: ≤0.07 K/uL		Flow cytometry	OSU Internal Normal Range Study, October 2018 Soldin, Steven J. *Pediatric Reference Intervals* . 7th ed., AACC Press, 2011.	SEG+BAND%: 0.0-100.0 % LYMPH%: 0.0-100.0 % MONO%: 0.0-100.0 % EOS%: 0.0-100.0 % BASO%: 0.0-100.0 % IGRE%: 0.0-100.0 % NRBC: 0.0-600.0 /100 WBC SEG+BANDABS: 0.04-440.00 K/uL LYMPHABS: 0.04-440.00 K/uL MONOABS: 0.04-440.00 K/uL EOSABS: 0.04-440.00 K/uL BASOABS: 0.04-440.00 K/uL IGREABS: ≥0.04-440.00 K/uL	SEG+BAND%: 0.0-100.0 % LYMPH%: 0.0-100.0 % MONO%: 0.0-100.0 % EOS%: 0.0-100.0 % BASO%: 0.0-100.0 % IGRE%: 0.0-100.0 % NRBC: 0.0-600.0 /100 WBC SEG+BANDABS: ≥440.00 K/uL LYMPHABS: ≥440.00 K/uL MONOABS: ≥440.00 K/uL EOSABS: ≥440.00 K/uL BASOABS: ≥440.00 K/uL IGREABS: ≥440.00 K/uL
Extended Reticulocyte Panel	**RETIC** 0-3 days: 3.47-5.40 % 4-30 days: 1.06-2.37 % 31-60 days: 2.12-3.47 % 61-179 days: 1.55-2.70 % 180 days-2 years: 0.99-1.82 % 2-5 years: 0.82-1.45 % 6-11 years: 0.98-1.94 % 12-17 years: 0.90-1.49 % 18+ years: 0.74-2.54 % **RETICABS** 0-3 days: 0.1475-0.2164 M/uL 4-30 days: 0.0513-0.1104 M/uL 31-60 days: 0.0518-0.0779 M/uL 61-179 days: 0.0482-0.0882 M/uL 180 days-2 years: 0.0435-0.1111 M/uL 2-5 years: 0.0364-0.0680 M/uL 6-11 years: 0.0424-0.0702 M/uL 12-17 years: 0.0416-0.0651 M/uL	**RETIC** 0-3 days: 3.47-5.40 % 4-30 days: 1.06-2.37 % 31-60 days: 2.12-3.47 % 61-179 days: 1.55-2.70 % 180 days-2 years: 0.99-1.82 % 2-5 years: 0.82-1.45 % 6-11 years: 0.98-1.94 % 12-17 years: 0.90-1.49 % 18+ years: 0.68-2.64 % **RETICABS** 0-3 days: 0.1475-0.2164 M/uL 4-30 days: 0.0513-0.1104 M/uL 31-60 days: 0.0518-0.0779 M/uL 61-179 days: 0.0482-0.0882 M/uL 180 days-2 years: 0.0435-0.1111 M/uL 2-5 years: 0.0364-0.0680 M/uL 6-11 years: 0.0424-0.0702 M/uL 12-17 years: 0.0416-0.0651 M/uL		Flow cytometry / calculation	OSU Internal Normal Range Study, October 2018	RETIC: 0.25-30.00% RETICABS XN: 0.0100-0.7200	RETIC: 0.25-30.00 % RETICABS 0.0100-2.5800 Manual: 0.0100-2.5800*

	18+ years: 0.0124-0.1142 M/uL **IRETF** 0-3 days: 30.5-35.1 % 4-30 days: 14.5-24.6 % 31-60 days: 19.1-28.9 % 61-179 days: 13.4-23.3 % 180 days-2 years: 11.4-25.8 % 2-5 years: 8.4-21.7 % 6-11 years: 8.9-24.1 % 12-17 years: 9.0-18.7 % 18+ years: 1.1-16.2 % **RETHE** 0-179 days: 29.2-37.5 pg 180 days-2 years: 30.1-35.7 pg 2-5 years: 29.3-37.3 pg 6-11 years: 30.4-39.7 pg 12-17 years: 29.9-38.4 pg 18+ years: 28.8-39.9 pg	18+ years: 0.0317-0.1377 M/uL **IRETF** 0-3 days: 30.5-35.1 % 4-30 days: 14.5-24.6 % 31-60 days: 19.1-28.9 % 61-179 days: 13.4-23.3 % 180 days-2 years: 11.4-25.8 % 2-5 years: 8.4-21.7 % 6-11 years: 8.9-24.1 % 12-17 years: 9.0-18.7 % 18+ years: 0.2-16.3 % **RETHE** 0-179 days: 27.6-38.7 pg 180 days-2 years: 28.7-35.7 pg 2-5 years: 27.7-37.8 pg 6-11 years: 32.4-37.6 pg 12-17 years: 30.3-40.4 pg 18+ years: 29.9-38.7 pg			Soldin, Steven J. *Pediatric Reference Intervals* . 7th ed., AACC Press, 2011.	Manual: 0.0100-2.5800 IRETF: 0.0-100.0 %	IRETF: 0.0-100.0 % *Instrument may prompt dilution but final result should not exceed 2.5800
Fetal (Pre) CBC, DIFF, Retic	See HEM3 and LAB296 **BLAST%** ≤0.0 % **LYMPHOMA%** ≤0.0 % **HAIRY%** ≤0.0 % **PLASMA%** ≤0.0 % **PROLYMPH%** ≤0.0 % **OTHER%** ≤0.0 % **NRBC** 0.0-0.2 /100 WBC **SEG+BANDABS** 0-14 days: 1.75-6.75 K/uL 15-30 days: 1.23-4.80 K/uL 31-60 days: 1.00-4.68 K/uL 61-179 days: 1.04-7.20 K/uL 180 days-2 years: 1.27-7.18 K/uL 2-5 years: 1.68-8.29 K/uL 6-11 years: 1.64-7.87 K/uL 12-17 years: 1.82-7.47 K/uL 18+ years: 1.64-7.28 K/uL **LYMPHABS** 0-14 days: 1.75-8.00 K/uL 15-30 days: 2.42-8.20 K/uL 31-60 days: 2.29-9.14 K/uL 61-179 days: 2.14-8.99 K/uL 180 days-2 years: 1.52-8.09 K/uL 2-5 years: 1.25-5.77 K/uL 6-11 years: 1.16-4.28 K/uL 12-17 years: 1.16-3.33 K/uL 18+ years: 1.16-3.51 K/uL **MONOABS** 0-14 days: 0.57-1.72 K/uL 15-30 days: 0.42-1.21 K/uL 31-60 days: 0.28-1.21 K/uL 61-179 days: 0.24-1.17 K/uL 180 days-2 years: 0.26-1.08 K/uL 2-5 years: 0.24-0.92 K/uL 6-11 years: 0.19-0.81 K/uL 12-17 years: 0.19-0.72 K/uL 18+ years: 0.22-0.87 K/uL **EOSABS** 0-14 days: 0.09-0.64 K/uL 15-30 days: 0.06-0.75 K/uL 31-60 days: 0.04-0.83 K/uL 61-179 days: 0.02-0.74 K/uL 180 days-2 years: 0.02-0.58 K/uL 2-5 years: 0.03-0.46 K/uL 6-11 years: 0.03-0.47 K/uL 12-17 years: 0.02-0.32 K/uL 18+ years: 0.00-0.42 K/uL **BASOABS** 0-14 days: 0.02-0.07 K/uL 15-30 days: 0.01-0.06 K/uL 31-60 days: 0.01-0.05 K/uL 61-179 days: 0.01-0.07 K/uL 180 days-2 years: 0.01-0.06 K/uL 2-5 years: 0.01-0.06 K/uL 6-11 years: 0.01-0.05 K/uL 12-17 years: 0.01-0.05 K/uL 18+ years: 0.00-0.13 K/uL **METAABS** 0-1 days: ≤0.28 K/uL 2-12 days: ≤0.27 K/uL 13-29 days: ≤0.22 K/uL 30-89 days: ≤0.09 K/uL 90-179 days: ≤0.06 K/uL 180 days-2 years: ≤0.14 K/uL 2-5 years: ≤0.06 K/uL 6-11 years: ≤0.04 K/uL 12-17 years: ≤0.04 K/uL 18+ years: ≤0.08 K/uL **MYELOABS** 0-1 days: ≤0.28 K/uL 2-12 days: ≤0.27 K/uL 13-29 days: ≤0.22 K/uL 30-89 days: ≤0.09 K/uL 90-179 days: ≤0.06 K/uL 180 days-2 years: ≤0.14 K/uL 2-5 years: ≤0.06 K/uL 6-11 years: ≤0.04 K/uL 12-17 years: ≤0.04 K/uL 18+ years: ≤0.08 K/uL **PROMYELOABS** 0-1 days: ≤0.28 K/uL 2-12 days: ≤0.27 K/uL 13-29 days: ≤0.22 K/uL 30-89 days: ≤0.09 K/uL 90-179 days: ≤0.06 K/uL	See HEM3 and LAB296 **BLAST%** ≤0.0 % **LYMPHOMA%** ≤0.0 % **HAIRY%** ≤0.0 % **PLASMA%** ≤0.0 % **PROLYMPH%** ≤0.0 % **OTHER%** ≤0.0 % **NRBC** 0.0-0.2 /100 WBC **SEG+BANDABS** 0-14 days: 1.60-6.06 K/uL 15-30 days: 1.18-5.45 K/uL 31-60 days: 0.83-4.23 K/uL 61-179 days: 0.97-5.45 K/uL 180 days-2 years: 1.19-7.21 K/uL 2-5 years: 1.54-7.92 K/uL 6-11 years: 1.63-7.55 K/uL 12-17 years: 1.54-7.04 K/uL 18+ years: 1.57-6.19 K/uL **LYMPHABS** 0-14 days: 2.07-7.53 K/uL 15-30 days: 2.11-8.38 K/uL 31-60 days: 2.47-7.95 K/uL 61-179 days: 2.45-8.89 K/uL 180 days-2 years: 1.56-7.83 K/uL 2-5 years: 1.13-5.52 K/uL 6-11 years: 0.97-3.96 K/uL 12-17 years: 0.97-3.26 K/uL 18+ years: 0.83-3.57 K/uL **MONOABS** 0-14 days: 0.52-1.77 K/uL 15-30 days: 0.28-1.38 K/uL 31-60 days: 0.28-1.05 K/uL 61-179 days: 0.28-1.07 K/uL 180 days-2 years: 0.25-1.15 K/uL 2-5 years: 0.19-0.94 K/uL 6-11 years: 0.19-0.85 K/uL 12-17 years: 0.18-0.78 K/uL 18+ years: 0.24-0.93 K/uL **EOSABS** 0-14 days: 0.12-0.66 K/uL 15-30 days: 0.08-0.80 K/uL 31-60 days: 0.05-0.57 K/uL 61-179 days: 0.03-0.61 K/uL 180 days-2 years: 0.02-0.82 K/uL 2-5 years: 0.03-0.53 K/uL 6-11 years: 0.03-0.52 K/uL 12-17 years: 0.04-0.38 K/uL 18+ years: 0.00-0.48 K/uL **BASOABS** 0-14 days: 0.02-0.11 K/uL 15-30 days: 0.01-0.07 K/uL 31-60 days: 0.01-0.07 K/uL 61-179 days: 0.01-0.06 K/uL 180 days-2 years: 0.01-0.06 K/uL 2-5 years: 0.01-0.06 K/uL 6-11 years: 0.01-0.06 K/uL 12-17 years: 0.01-0.01 K/uL 18+ years: 0.00-0.09 K/uL **METAABS** 0-1 days: ≤0.28 K/uL 2-12 days: ≤0.27 K/uL 13-29 days: ≤0.22 K/uL 30-89 days: ≤0.00 K/uL 90-179 days: ≤0.06 K/uL 180 days-2 years: ≤0.14 K/uL 2-5 years: ≤0.06 K/uL 6-11 years: ≤0.04 K/uL 12-17 years: ≤0.04 K/uL 18+ years: ≤0.07 K/uL **MYELOABS** 0-1 days: ≤0.28 K/uL 2-12 days: ≤0.27 K/uL 13-29 days: ≤0.22 K/uL 30-89 days: ≤0.00 K/uL 90-179 days: ≤0.06 K/uL 180 days-2 years: ≤0.14 K/uL 2-5 years: ≤0.06 K/uL 6-11 years: ≤0.04 K/uL 12-17 years: ≤0.04 K/uL 18+ years: ≤0.07 K/uL **PROMYELOABS** 0-1 days: ≤0.28 K/uL 2-12 days: ≤0.27 K/uL 13-29 days: ≤0.22 K/uL 30-89 days: ≤0.00 K/uL 90-179 days: ≤0.06 K/uL		The Sysmex XN performs hematology analysis according to the hydrodynamic focusing (DC detection), flow cytometry method (semiconductor laser), and sodium lauryl sulfate (SLS)-hemoglobin method.	OSU Internal Normal Range Study, October 2018 Soldin, Steven J. *Pediatric Reference Intervals* . 7th ed., AACC Press, 2011.	See HEM3 and LAB296 BAND%: 0.0-100.0 % SEG%: 0.0-100.0 % LYMPH%: 0.0-100.0 % MONO%: 0.0-100.0 % EOS%: 0.0-100.0 % BASO%: 0.0-100.0 % META%: 0.0-100.0 % MYELO%: 0.0-100.0 % PROMYELO%: 0.0-100.0 % BLAST%: 0.0-100.0 % LYMPHOMA%: 0.0-100.0 % HAIRY%: 0.0-100.0 % PLASMA%: 0.0-100.0 % PROLYMPH%: 0.0-100.0 % OTHER%: 0.0-100.0 % SEG+BANDABS: 0.00-440.00 K/uL LYMPHABS: 0.00-440.00 K/uL MONOABS: 0.00-440.00 K/uL EOSABS: 0.00-440.00 K/uL BASOABS: 0.00-440.00 K/uL METAABS: 0.00-440.00 K/uL MYELOABS: 0.00-440.00 K/uL PROMYELOABS: 0.00-440.00 K/uL BLASTABS: 0.00-440.00 K/uL LYMPHOMAABS: 0.00-440.00 K/uL HAIRYABS: 0.00-440.00 K/uL PLASMAABS: 0.00-440.00 K/uL PROLYMPHABS: 0.00-440.00 K/uL OTHERABS: 0.00-440.00 K/uL	See HEM3 and LAB296 BAND%: 0.0-100.0 % SEG%: 0.0-100.0 % LYMPH%: 0.0-100.0 % MONO%: 0.0-100.0 % EOS%: 0.0-100.0 % BASO%: 0.0-100.0 % META%: 0.0-100.0 % MYELO%: 0.0-100.0 % PROMYELO%: 0.0-100.0 % BLAST%: 0.0-100.0 % LYMPHOMA%: 0.0-100.0 % HAIRY%: 0.0-100.0 % PLASMA%: 0.0-100.0 % PROLYMPH%: 0.0-100.0 % OTHER%: 0.0-100.0 % SEG+BANDABS: ≤0.00 Ln/L. LYMPHABS: ≤0.00 L.n/L. MONOABS: ≤0.00 L/nL. EOSABS: ≤0.00 L/nL. BASOABS: ≤0.00 L/nL. METAABS: ≤0.00 L/nL. MYELOABS: ≤0.00 L/nL. PROMYELOABS: ≤0.00 L/nL. BLASTABS: ≤0.00 L/nL. LYMPHOMAABS: ≤0.00 L/nL. HAIRYABS: ≤0.00 L/nL. PLASMAABS: ≤0.00 L/nL. PROLYMPHABS: ≤0.00 L/nL. OTHERABS: ≤0.00 L/nL. SCHISTO: 1+, 2+, 3+ POLY: 1+, 2+, 3+ SICKLE: 1+, 2+, 3+ SPHEROCYTES: 1+, 2+, 3+ ACANTHO: Present ECHINO: Present OVALO: Present TARGET: Present TEAR: Present HIBODIES: Present ROULEAUX: Present AGGLUT: Present PLTCLUMP: Present GIANT: Present SATELLITISM: Present

	180 days-2 years: ≤0.14 K/uL 2-5 years: ≤0.06 K/uL 6-11 years: ≤0.04 K/uL 12-17 years: ≤0.04 K/uL 18+ years: ≤0.08 K/uL **BLASTABS** ≤0.00 K/uL **LYMPHOMAABS** ≤0.00 K/uL **HAIRYABS** ≤0.00 K/uL **PLASMAABS** ≤0.00 K/uL **PROLYMPHABS** ≤0.00 K/uL **OTHERABS** ≤0.00 K/uL	180 days-2 years: ≤0.14 K/uL 2-5 years: ≤0.06 K/uL 6-11 years: ≤0.04 K/uL 12-17 years: ≤0.04 K/uL 18+ years: ≤0.07 K/uL **BLASTABS** ≤0.00 K/uL **LYMPHOMAABS** ≤0.00 K/uL **HAIRYABS** ≤0.00 K/uL **PLASMAABS** ≤0.00 K/uL **PROLYMPHABS** ≤0.00 K/uL **OTHERABS** ≤0.00 K/uL					
Hematocrit	0-14 days: 39.6-57.2 % 15-30 days: 32.0-44.5 % 31-60 days: 27.7-35.1 % 61-179 days: 29.5-37.1 % 180 days-2 years: 30.9-37.9 % 2-5 years: 31.2-37.8 % 6-11 years: 32.4-39.5 % 12-17 years: 33.4-40.4 % 18+ years: 34.9-44.5 %	0-14 days: 39.8-53.6 % 15-30 days: 30.5-45.0 % 31-60 days: 26.8-37.5 % 61-179 days: 28.6-37.2 % 180 days-2 years: 30.8-37.8 % 2-5 years: 31.0-37.7 % 6-11 years: 32.2-39.8 % 12-17 years: 33.9-43.5 % 18+ years: 39.6-48.8 %		Cumulative pulse height detection.	OSU Internal Normal Range Study, October 2018 Soldin, Steven J. *Pediatric Reference Intervals* . 7th ed., AACC Press, 2011.	0.1-75.0 %	0.1 %-dilute to endpoint
Hemoglobin	0-7 days: 13.4-20.0 g/dL 8-14 days: 13.4-20.0 g/dL 15-30 days: 10.8-14.6 g/dL 31-60 days: 9.2-11.4 g/dL 61-179 days: 9.9-12.4 g/dL 180 days-2 years: 10.2-12.7 g/dL 2-5 years: 10.2-12.7 g/dL 6-11 years: 10.6-13.2 g/dL 12-17 years: 10.8-13.3 g/dL 18+ years: 11.4-15.2 g/dL	0-7 days: 13.9-19.1 g/dL 8-14 days: 13.9-19.1 g/dL 15-30 days: 10.0-15.3 g/dL 31-60 days: 8.9-12.7 g/dL 61-179 days: 9.6-12.4 g/dL 180 days-2 years: 10.1-12.5 g/dL 2-5 years: 10.2-12.7 g/dL 6-11 years: 10.7-13.4 g/dL 12-17 years: 11.0-14.5 g/dL 18+ years: 13.4-16.8 g/dL		Photometrically measured.	OSU Internal Normal Range Study, October 2018 Soldin, Steven J. *Pediatric Reference Intervals* . 7th ed., AACC Press, 2011.	0.2-26.0 g/dL	0.2 g/dL-dilute to endpoint
Hemoglobin & Hematocrit	**HGB** 0-7 days: 13.4-20.0 g/dL 8-14 days: 13.4-20.0 g/dL 15-30 days: 10.8-14.6 g/dL 31-60 days: 9.2-11.4 g/dL 61-179 days: 9.9-12.4 g/dL 180 days-2 years: 10.2-12.7 g/dL 2-5 years: 10.2-12.7 g/dL 6-11 years: 10.6-13.2 g/dL 12-17 years: 10.8-13.3 g/dL 18+ years: 11.4-15.2 g/dL **HCT** 0-14 days: 39.6-57.2 % 15-30 days: 32.0-44.5 % 31-60 days: 27.7-35.1 % 61-179 days: 29.5-37.1 % 180 days-2 years: 30.9-37.9 % 2-5 years: 31.2-37.8 % 6-11 years: 32.4-39.5 % 12-17 years: 33.4-40.4 % 18+ years: 34.9-44.5 %	**HGB** 0-7 days: 13.9-19.1 g/dL 8-14 days: 13.9-19.1 g/dL 15-30 days: 10.0-15.3 g/dL 31-60 days: 8.9-12.7 g/dL 61-179 days: 9.6-12.4 g/dL 180 days-2 years: 10.1-12.5 g/dL 2-5 years: 10.2-12.7 g/dL 6-11 years: 10.7-13.4 g/dL 12-17 years: 11.0-14.5 g/dL 18+ years: 13.4-16.8 g/dL **HCT** 0-14 days: 39.8-53.6 % 15-30 days: 30.5-45.0 % 31-60 days: 26.8-37.5 % 61-179 days: 28.6-37.2 % 180 days-2 years: 30.8-37.8 % 2-5 years: 31.0-37.7 % 6-11 years: 32.2-39.8 % 12-17 years: 33.9-43.5 % 18+ years: 39.6-48.8 %		**HGB:** Photometrically measured. **HCT:** Cumulative pulse height detection.	OSU Internal Normal Range Study, October 2018 Soldin, Steven J. *Pediatric Reference Intervals* . 7th ed., AACC Press, 2011.	See individual analytes	See individual analytes
Immature Platelet Fraction	**IPF** 0-179 days: 1.3-6.8 % 180 days-2 years: 1.4-4.5 % 2-5 years: 1.0-3.6 % 6-11 years: 1.0-4.7 % 12-17 years: 1.4-6.4 % 18+ years: 0.0-8.6 % **PLTCIPF** 0-14 days: 144-449 K/uL 15-30 days: 279-571 K/uL 31-60 days: 331-597 K/uL 61-179 days: 247-580 K/uL 180 days-2 years: 214-459 K/uL 2-5 years: 189-394 K/uL 6-11 years: 199-367 K/uL 12-17 years: 194-345 K/uL 18+ years: 150-393 K/uL	**IPF** 0-179 days: 2.0-6.8 % 180 days-2 years: 1.4-3.8 % 2-5 years: 1.1-3.6 % 6-11 years: 1.0-4.9 % 12-17 years: 1.6-6.1 % 18+ years: 0.0-9.0 % **PLTCIPF** 0-14 days: 218-419 K/uL 15-30 days: 248-586 K/uL 31-60 days: 229-562 K/uL 61-179 days: 244-529 K/uL 180 days-2 years: 206-445 K/uL 2-5 years: 202-403 K/uL 6-11 years: 206-369 K/uL 12-17 years: 175-332 K/uL 18+ years: 146-337 K/uL		Calculation	OSU Internal Normal Range Study, October 2018 Soldin, Steven J. *Pediatric Reference Intervals* . 7th ed., AACC Press, 2011.	IPF: 0.0-100.0 % PLTCIPF: 5-5,000 K/uL	IPF: 0.0-100.0 % PLTCIPF: 5 K/uL-dilute to endpoint
Malaria Prep				Giemsa stain			No parasitic organisms seen, including plasmodium organisms Positive for Plasmodium species
Platelet Count	**PLT** 0-14 days: 144-449 K/uL 15-30 days: 279-571 K/uL 31-60 days: 331-597 K/uL 61-179 days: 247-580 K/uL 180 days-2 years: 214-459 K/uL 2-5 years: 189-394 K/uL 6-11 years: 199-367 K/uL 12-17 years: 194-345 K/uL 18+ years: 150-393 K/uL **MPV** 0-14 days: 10.4-12.0 fL 15-30 days: 10.0-12.2 fL 31-60 days: 9.4-11.1 fL 61-179 days: 9.0-10.9 fL 180 days-2 years: 8.8-10.6 fL 2-5 years: 8.9-11.0 fL 6-11 years: 9.3-11.3 fL 12-17 years: 9.6-11.7 fL 18+ years: 8.5-12.2 fL	**PLT** 0-14 days: 218-419 K/uL 15-30 days: 248-586 K/uL 31-60 days: 229-562 K/uL 61-179 days: 244-529 K/uL 180 days-2 years: 206-445 K/uL 2-5 years: 202-403 K/uL 6-11 years: 206-369 K/uL 12-17 years: 175-332 K/uL 18+ years: 146-337 K/uL **MPV** 0-14 days: 10.2-11.9 fL 15-30 days: 10.1-12.1 fL 31-60 days: 9.2-10.8 fL 61-179 days: 8.9-10.6 fL 180 days-2 years: 8.7-10.5 fL 2-5 years: 9.0-10.9 fL 6-11 years: 9.2-11.4 fL 12-17 years: 9.6-11.8 fL 18+ years: 8.7-12.3 fL		Electronic resistance detection and flow cytometry.	OSU Internal Normal Range Study, October 2018 Soldin, Steven J. *Pediatric Reference Intervals* . 7th ed., AACC Press, 2011.	5-5,000 K/uL	5 K/uL-dilute to endpoint
Reticulocytes	**RETIC** 0-3 days: 3.47-5.40 % 4-30 days: 1.06-2.37 % 31-60 days: 2.12-3.47 % 61-179 days: 1.55-2.70 % 180 days-2 years: 0.99-1.82 % 2-5 years: 0.82-1.45 % 6-11 years: 0.98-1.94 % 12-17 years: 0.90-1.40 % 18+ years: 0.74-2.54 % **RETICABS** 0-3 days: 0.1475-0.2164 M/uL 4-30 days: 0.0913-0.1104 M/uL 31-60 days: 0.0518-0.0779 M/uL 61-179 days: 0.0482-0.0882 M/uL 180 days-2 years: 0.0435-0.1111 M/uL 2-5 years: 0.0364-0.0680 M/uL 6-11 years: 0.0424-0.0702 M/uL 12-17 years: 0.0416-0.0651 M/uL 18+ years: 0.0324-0.1142 M/uL	**RETIC** 0-3 days: 3.47-5.40 % 4-30 days: 1.06-2.37 % 31-60 days: 2.12-3.47 % 61-179 days: 1.55-2.70 % 180 days-2 years: 0.99-1.82 % 2-5 years: 0.82-1.45 % 6-11 years: 0.98-1.94 % 12-17 years: 0.90-1.40 % 18+ years: 0.68-2.64 % **RETICABS** 0-3 days: 0.1475-0.2164 M/uL 4-30 days: 0.0513-0.1104 M/uL 31-60 days: 0.0518-0.0779 M/uL 61-179 days: 0.0482-0.0882 M/uL 180 days-2 years: 0.0435-0.1111 M/uL 2-5 years: 0.0364-0.0680 M/uL 6-11 years: 0.0424-0.0702 M/uL 12-17 years: 0.0416-0.0651 M/uL 18+ years: 0.0317-0.1377 M/uL		Flow cytometry	OSU Internal Normal Range Study, October 2018 Soldin, Steven J. *Pediatric Reference Intervals* . 7th ed., AACC Press, 2011.	RETIC: 0.25-30.00% RETICABS: XN: 0.0100-0.7200 Manual: 0.0100-2.5800	RETIC: 0.25-30.00 % RETICABS: 0.0100-2.5800 Manual: 0.0100-2.5800* *Instrument may prompt dilution but final result should not exceed 2.5800
Schistocytes				Manual			
Sedimentation Rate, Automated	0-49 years: <20 mm/hr 50-84 years: <30 mm/hr 85+ years: <42 mm/hr	0-49 years: <15 mm/hr 50-84 years: <20 mm/hr 85+ years: <30 mm/hr		Westergren	McPherson, R. A., & Pinkus, M.R. (2017). *Henry's Clinical Diagnosis and Management by Laboratory Methods* (23rd ed.). St. Louis, MO: Elsevier Inc. pg. 532	1-140 mm/hr	1-140 mm/hr
White Blood Count	0-14 days: 8.16-14.56 K/uL 15-30 days: 8.36-14.43 K/uL 31-60 days: 7.05-14.68 K/uL 61-179 days: 6.00-13.25 K/uL 180 days-2 years: 6.48-13.02 K/uL 2-5 years: 4.86-13.18 K/uL 6-11 years: 4.27-11.40 K/uL 12-17 years: 4.19-9.43 K/uL 18+ years: 3.99-11.19 K/uL	0-14 days: 8.04-15.40 K/uL 15-30 days: 7.80-15.91 K/uL 31-60 days: 8.14-14.99 K/uL 61-179 days: 6.51-15.32 K/uL 180 days-2 years: 5.98-13.51 K/uL 2-5 years: 5.14-13.38 K/uL 6-11 years: 4.31-11.00 K/uL 12-17 years: 3.84-9.84 K/uL 18+ years: 3.73-10.10 K/uL		Flow cytometry	OSU Internal Normal Range Study, October 2018 Soldin, Steven J. *Pediatric Reference Intervals* . 7th ed., AACC Press, 2011.	0.30-440.00 K/uL	0.30 K/uL-dilute to endpoint
Body Fluid Cell Count				Hemocytometer counts and Iris instrument.		TNC: 3-2,500 /uL RBC: 3-50,000 /uL	TNC: ≥3 /uL RBC: ≥3 /uL
Body Fluid Cell Count with Diff	**SFBLAST** 0% **SFMALIG** 0% **SFLYMPHOM** 0%			Hemocytometer counts, Iris instrument and manual differential.		TNC: 3-2,500 /uL RBC: 3-50,000 /uL FSEG: 0-100 % FLYM: 0-100 % FMEMAC: 0-100 % FMESO: 0-100 % FEOS: 0-100 % FBASO: 0-100 % FPLAS: 0-100 % FMALIG: 0-100 % FBLAS: 0-100 % FLPHOM: 0-100 % FSYNLC: 0-100 % FNERC: 0-100 % FOTHR: 0-100 %	TNC: ≥3 /uL RBC: ≥3 /uL FSEG: 0-100 % FLYM: 0-100 % FMEMAC: 0-100 % FMESO: 0-100 % FEOS: 0-100 % FBASO: 0-100 % FPLAS: 0-100 % FMALIG: 0-100 % FBLAS: 0-100 % FLPHOM: 0-100 % FSYNLC: 0-100 % FNERC: 0-100 % FOTHR: 0-100 %

Cell Count & Diff, CSF	**SFWBC** 0-365 days: <31 /uL 1-4 years: <21 /uL 5+ years: <6 /uL **SFRBC** <3 /uL **SFSEG** 0-89 days: ≤8 % 90+ days: ≤6 % **SFLYM** 0-89 days: 35-50% 90+ days: 40-80 % **SFMOMA** 0-89 days: 50-80% 90+ days: 15-45 %		Hemocytometer counts, Iris instrument and manual differential.	*Body Fluids* 3rd ed. Kjeldsbreg, Knight 1993	SFWBC: 3-2,500 /uL SFRBC: 3-50,000 /uL SFSEG: 0-100 % SFLYM: 0-100 % SFMOMA: 0-100 % SFEOS: 0-100 % SFBAS: 0-100 % SFPLAS: 0-100 % SFMALIG: 0-100 % SFBLAS: 0-100 % SFLPHOM: 0-100 % SFNRBC: 0-100 % SFOTHR: 0-100 %	SGROS: Amber, Bloody, Brown, Colorless, Green, Orange, Pink, Red, Red-cell tinged, White, Xanthrochromic, Clear, Hazy, Opaque SSUPN: Amber, Bloody, Brown, Colorless, Green, Orange, Pink, Red, Red-cell tinged, White, Xanthrochromic, Clear, Hazy, Opaque SFWBC: ≥3 /uL SFRBC: ≥3 /uL SFSEG: 0-100 % SFLYM: 0-100 % SFMOMA: 0-100 % SFEOS: 0-100% SFBAS: 0-100 % SFPLAS: 0-100 % SFMALIG: 0-100 % SFBLAS: 0-100 % SFLPHOM: 0-100 % SFNRBC: 0-100 % SFOTHR: 0-100 %
Crystals, Fluid		Negative	Unstained synovial fluid slides reviewed by polarized microscopy.			Negative, Positive
CSF Fluid Count Only	**SFWBC** 0-365 days: <31 /uL 1-4 years: <21 /uL 5+ years: <6 /uL **SFRBC** <3 /uL		Hemocytometer counts and Iris instrument.	*Body Fluids* 3rd ed. Kjeldsbreg, Knight 1993	SFWBC: 3-2,500 /uL SFRBC: 3-50,000 /uL	CSFTUBENUM: CSF Tube 1, CSF Tube 2, CSF Tube 3, CSF Tube 4, No tube number indicated SGROS: Amber, Bloody, Brown, Colorless, Green, Orange, Pink, Red, Red-cell tinged, White, Xanthrochromic, Clear, Hazy, Opaque SSUPN: Amber, Bloody, Brown, Colorless, Green, Orange, Pink, Red, Red-cell tinged, White, Xanthrochromic, Clear, Hazy, Opaque SFWBC: ≥3 /uL SFRBC: ≥3 /uL
Differential, Fluid	**SFBLAST** 0% **SFMALIG** 0% **SFLYMPHOM** 0%		Microscopic evaluation of body fluid cells is performed by reviewing a Wright-stained body fluid cytospin slide using a brightfield microscope.		FSEG: 0-100 % FLYM: 0-100 % FMOMAC: 0-100 % FMESO: 0-100 % FEOS: 0-100 % FBASO: 0-100 % FPLAS: 0-100 % FMALIG: 0-100 % FBLAS: 0-100 % FLPHOM: 0-100 % FSYNLC: 0-100 % FNRBC: 0-100 % FOTHR: 0-100 %	FSEG: 0-100 % FLYM: 0-100 % FMOMAC: 0-100 % FMESO: 0-100 % FEOS: 0-100 % FBASO: 0-100 % FPLAS: 0-100 % FMALIG: 0-100 % FBLAS: 0-100 % FLPHOM: 0-100 % FSYNLC: 0-100 % FNRBC: 0-100 % FOTHR: 0-100 %
Hematocrit, Fluid			Manual spun hematocrit.		5.0-60.0 %	5.0-60.0 %
Myoglobin Urine		Negative	The peroxidase-like activity of hemoglobin catalyzes the reaction of diisopropylbenzene dihydroperoxide and 3,3',5,5'-tetramethylbenzidine to produce a color from orange to green.	*Urinalysis and Body Fluid* , Ringerud 1995		UBLD: Negative, Trace, Small, Moderate, Large MYO: Negative, Reflexed to Sendout
Occult Blood, Fecal-Immunological Test (FIT)		Negative	Immunoassay utilizing rabbit polyclonal antibodies to detect presence of hemoglobin in feces.			Negative, Positive
Occult Blood, Gastric		Negative	Developing solution (stabilized mixture of hydrogen peroxide and denatured alcohol) creates a reaction between hemoglobin and guaiac to produce a blue color.			Negative, Positive
Occult Blood, Fecal Card Test (Guaiac)		Negative	Developing solution (stabilized mixture of hydrogen peroxide and denatured alcohol) creates a reaction between hemoglobin and guaiac to produce a blue color.			Negative, Positive
pH, Urine	5.0-7.0		Double indicator principle to cover the range of urinary pH range. Colors range from orange through yellow and green to blue.	*Urinalysis and Body Fluid* , Ringerud 1995		MMMP: 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0, ≥8.5, Unable to analyze due to interfering substance. SSCHC: 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0, ≥8.5, Unable to analyze due to interfering substance. JWC: 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0, ≥9.5, Unable to analyze due to interfering substance. Unspecified: 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0, 8.5, ≥9.0, Unable to analyze due to interfering substance.
Specific Gravity, Urine	1.001-1.035		Clinical Lab CCL: Fiber optic refractive index method. Clinical Lab University East: Fiber optic refractive index method. Clinical Lab James: Fiber optic refractive index method. All Performing Labs: pKa change of pretreated polyelectrolyte in relation to ionic concentration.	*Urinalysis and Body Fluid* , Ringerud 1995	CCL: 1.001-1.045 RIL: 1.001-1.045 JAMES: 1.001-1.045 Unspecified: 1.005-1.030	CCL: 1.001-1.045 RIL: 1.001-1.045 JAMES: 1.001-1.045 Unspecified: 1.005-1.030
Synovasure PH, Synovial Fluid		Negative	Qualitative, visually read immunochromatographic assay for the detection of human host response proteins, Alpha Defensin 1-3, in the synovial fluid of adults with a total joint replacement who are being evaluated for revision surgery.			Negative, Positive
Urinalysis		**COLOR:** Yellow **APPEARANCE:** Clear **GLUCOSE:** Negative **KETONE:** Negative **SPECIFIC GRAVITY:** 1.001-1.035 **BLOOD:** Negative **PH:** 5.0, 5.5, 6.0, 6.5, 7.0 **PROTEIN:** Negative **UROBILINOGEN:** 0.2 E.U./dL, 1.0 E.U./dL **NITRITE:** Negative **LEUKOCYTE ESTERASE:** Negative **RBC:** 0-2 /HPF **WBC:** 0-5 /HPF **SQUAMOUS:** 0-2/hpf, 3-5/hpf = 1+ **BACTERIA:** Absent **RENAL TUBULAR CELLS:** 0-2/hpf **WBC CASTS:** Absent **WBC/RENAL TUBULAR CASTS:** Absent **RBC CASTS:** Absent **YEAST:** Absent **TRICHOMONAS:** Absent **LEUCINE:** Absent **TYROSINE:** Absent **CYSTINE:** Absent **TRIPLE PHOSPHATE:** Absent	**DIPSTICK** Dry pad urine chemistry **SG** Dry pad urine chemistry or optic refractive index method **URINE MICROSCOPIC** Automatic particle counter and/or manual microscopic	Varies		COLOR: Yellow, Orange, Red, See Comment APPEAR: Clear, Cloudy, Turbid, Unable to analyze due to interfering substance. GLUCOSE: Negative, 100 mg/dL, 250 mg/dL, 500 mg/dL, ≥1000 mg/dL, Unable to analyze due to interfering substance. KETONE: Negative, Trace, 15 mg/dL = Small, 40 mg/dL = Moderate, ≥80 mg/dL = Large, Unable to analyze due to interfering substance. SPECIFIC GRAVITY: See individual analyte BLOOD: Negative, Trace, Small, Moderate, Large, Unable to analyze due to interfering substance. PH: See individual analyte PROTEIN: Negative, Trace, 30 mg/dL, 100 mg/dL, 300 mg/dL, ≥300 mg/dL, Unable to analyze due to interfering substance. UROBILINOGEN: 0.2 E.U./dL, 1.0 E.U./dL, 2.0 E.U./dL, 4.0 E.U./dL, ≥8.0 E.U./dL, Unable to analyze due to interfering substance. NITRITE: Negative, Positive, Unable to analyze due to interfering substance. LEUKOCYTE ESTERASE: Negative, Trace, Small, Moderate, Large, Unable to analyze due to interfering substance. RBC: 0-2, 3-5, 6-10, 11-25, >25 /HPF WBC: 0-5, 6-10, 11-20, > 20 /HPF SQUAMOUS: 0-2/hpf, 3-5/hpf = 1+, 6-10/hpf = 2+, 11-20/hpf = 3+, >20/hpf = 4+ BACTERIA: Absent, Trace, Present RENAL TUBULAR CELLS: 0-2/hpf, 3-5/hpf = 1+, 6-10/hpf = 2+, 11-20/hpf = 3+, >20/hpf = 4+ AMORPHOUS: <25% = Slight, 26-50% = Moderate, >51% = Heavy HYALINE CASTS: 0-2, 3-5, 6-10, 11-20, >20 /LPF GRANULAR CASTS: 0-2, 3-5, 6-10, 11-20, >20 /LPF WAXY CASTS: 0-2, 3-5, 6-10, 11-20, >20 /LPF BROAD CASTS: 0-2, 3-5, 6-10, 11-20, >20 /LPF WBC CASTS: 0-2, 3-5, 6-10, 11-20, >20 /LPF WBC/RENAL TUBULAR CASTS: 0-2, 3-5, 6-10, 11-20, >20 /LPF RENAL TUBULAR EPI CASTS: 0-2, 3-5, 6-10, 11-20, >20 /LPF RBC CASTS: 0-2, 3-5, 6-10, 11-20, >20 /LPF FATTY CASTS: 0-2, 3-5, 6-10, 11-20, >20 /LPF MUCUS: Present YEAST: Absent, Present TRICHOMONAS: Absent, Present SPERMATOZA: Present FIBERS: Present FECAL CONTAMINATION: Present CALCIUM OXALATE: Present URIC ACID: Present LEUCINE: Present TYROSINE: Present CYSTINE: Present TRIPLE PHOSPHATE: Present CALCIUM PHOSPHATE: Present
Urinalysis Reflex to Culture		**COLOR:** Yellow **APPEARANCE:** Clear **GLUCOSE:** Negative **KETONE:** Negative **SPECIFIC GRAVITY:** 1.001-1.035 **BLOOD:** Negative **PH:** 5.0, 5.5, 6.0, 6.5, 7.0 **PROTEIN:** Negative **UROBILINOGEN:** 0.2 E.U./dL, 1.0 E.U./dL **NITRITE:** Negative **LEUKOCYTE ESTERASE:** Negative **RBC:** 0-2 /HPF **WBC:** 0-5 /HPF	**DIPSTICK** Dry pad urine chemistry **SG**	Varies		See LAB547

			SQUAMOUS: 0-2/hpf, 3-5/hpf = 1+ **BACTERIA:** Absent **RENAL TUBULAR CELLS:** 0-2/hpf **WBC CASTS:** Absent **WBC/RENAL TUBULAR CASTS:** Absent **RBC CASTS:** Absent **YEAST:** Absent **TRICHOMONAS:** Absent **LEUCINE:** Absent **TYROSINE:** Absent **CYSTINE:** Absent **TRIPLE PHOSPHATE:** Absent	Dry pad urine chemistry or optic refractive index method **URINE MICROSCOPIC** Automatic particle counter and/or manual microscopic			
Urine Dipstick with Reflex to Microscopy			**COLOR:** Yellow **APPEARANCE:** Clear **GLUCOSE:** Negative **KETONE:** Negative **SPECIFIC GRAVITY:** 1.001-1.035 **BLOOD:** Negative **PH:** 5.0, 5.5, 6.0, 6.5, 7.0 **PROTEIN:** Negative **UROBILINOGEN:** 0.2 E.U./dL, 1.0 E.U./dL **NITRITE:** Negative **LEUKOCYTE ESTERASE:** Negative	**DIPSTICK** Dry pad urine chemistry **SG** Dry pad urine chemistry or optic refractive index method	Varies		See URN11
Urine Dipstick; Reflex Microscopy; Reflex Culture			**COLOR:** Yellow **APPEARANCE:** Clear **GLUCOSE:** Negative **KETONE:** Negative **SPECIFIC GRAVITY:** 1.001-1.035 **BLOOD:** Negative **PH:** 5.0, 5.5, 6.0, 6.5, 7.0 **PROTEIN:** Negative **UROBILINOGEN:** 0.2 E.U./dL, 1.0 E.U./dL **NITRITE:** Negative **LEUKOCYTE ESTERASE:** Negative	**DIPSTICK** Dry pad urine chemistry **SG** Dry pad urine chemistry or optic refractive index method	National guidelines and recommendations		See URN11
Urine Screen			**COLOR:** Yellow **APPEARANCE:** Clear **GLUCOSE:** Negative **KETONE:** Negative **SPECIFIC GRAVITY:** 1.001-1.035 **BLOOD:** Negative **PH:** 5.0, 5.5, 6.0, 6.5, 7.0 **PROTEIN:** Negative **UROBILINOGEN:** 0.2 E.U./dL, 1.0 E.U./dL **NITRITE:** Negative **LEUKOCYTE ESTERASE:** Negative	**DIPSTICK** Dry pad urine chemistry **SG** Dry pad urine chemistry or optic refractive index method	Varies		COLOR: Yellow, Orange, Red, See Comment APPEAR: Clear, Cloudy, Turbid, Unable to analyze due to interfering substance. GLUCOSE: Negative, 100 mg/dL, 250 mg/dL, 500 mg/dL, ≥1000 mg/dL, Unable to analyze due to interfering substance. KETONE: Negative, Trace, 15 mg/dL = Small, 40 mg/dL = Moderate, ≥80 mg/dL = Large, Unable to analyze due to interfering substance. SPECIFIC GRAVITY: See individual analyte BLOOD: Negative, Trace, Small, Moderate, Large, Unable to analyze due to interfering substance. PH: See individual analyte PROTEIN: Negative, Trace, 30 mg/dL, 100 mg/dL, 300 mg/dL, ≥300 mg/dL, Unable to analyze due to interfering substance. UROBILINOGEN: 0.2 E.U./dL, 1.0 E.U./dL, 2.0 E.U./dL, 4.0 E.U./dL, ≥8.0 E.U./dL, Unable to analyze due to interfering substance. NITRITE: Negative, Positive, Unable to analyze due to interfering substance. LEUKOCYTE ESTERASE: Negative, Trace, Small, Moderate, Large, Unable to analyze due to interfering substance.
Anti Phospholipid Antibody	**PLABG** 0.0-20.0 CU			Chemiluminescent two-step immunoassay.	Inova Quanta-Flash Package Insert	PLABG: 10.0-500.0 CU PLABM: 10.0-200.0 CU	PLABG: 10.0-10,000.0 CU PLABM: 10.0-4,000.0 CU
Anti Xa DOAC (Apixaban)			Therapeutic reference ranges have not been established. At steady state - median (5th-95th percentile) peak and trough levels have been observed in clinical trials: Peak Conc., Trough Conc., ng/mL (a) ng/mL (b) --- VTE prevention after total hip replacement 2.5 mg twice daily 77 (41-146) 51 (25-109) Stroke and systemic embolism prevention in patients with AF 2.5 mg twice daily 123 (69-221) 79 (34-162) 5 mg twice daily 171 (91-321) 103 (41-230) Prevention and treatment of DVT and PE 2.5 mg twice daily 67 (30-153) 32 (11-80) 5 mg twice daily 132 (59-302) 63 (22-77) 10 mg twice daily 251 (111-572) 120 (41-335) (a) Defined as samples collected 2-4 hours after dosing (b) Defined as samples collected 10-12 hours after dosing AF-atrial fibrillation, CR-CL-creatinine clearance, DVT-deep vein thrombosis, VTE-venous thromboembolism	Chromogenic measurement at 405nm.	**1.** Package insert: Rivaroxaban: Diagnostica Stago. Revised December 2014 **2.** Mueck W, Stampfuss J, Kubitza D, Becka M: Clinical pharmacokinetic and pharmacodynamic profile of rivaroxaban. Clinical Pharmacokinetics 2014; 53(1):1-16 doi: 10.1007/s40262-013-0100-7 **3.** Bayer Pharma AG. Xarelto (rivaroxaban) Summary of Product Characteristics; 2013. Available at: www.ema.europa.eu/docs/en_GB/document_library/EPAR_-_Product_Information/human/000944/WC500057108.pdf **4.** EINSTEIN Investigators, Bauersachs R, Berkowitz SD, et al: Oral rivaroxaban for symptomatic venous thromboembolism. N Engl J Med 2010; 363:2499-510 **5.** EINSTEIN-PE Investigators, Buller HR, Prins MH, et al: Oral rivaroxaban for the treatment of symptomatic pulmonary embolism. N Engl J Med 2012; 366:1287-1297 **6.** Patel MR, Mahaffey KW, Garg J, et al: Rivaroxaban versus warfarin in nonvalvular atrial fibrillation. N Engl J Med 2011; 365:883891 **7.** Siegal DM, Curnutte JT, Connolly SJ, et al: Andexanet alfa for reversal of factor Xa inhibitor activity. N Engl J Med 2015; 373:2413-2424 **8.** Martin K, Beyer-Westendorf J, Davidson BL, et al: Use of the direct oral anticoagulants in obese patients: guidance from the SSC of the ISTH. J Thromb Haemost 2016;14:1308-1313	23-500 ng/mL	23-500 ng/mL
Anti Xa DOAC (Rivaroxaban)			Therapeutic reference ranges have not been established. At steady state - median (5th-95th percentile) peak and trough levels have been observed in clinical trials: Peak Conc., Trough Conc. Dose Indication ng/mL (a) ng/mL (b) --- 2.5 mg Acute coronary 46 (28-70) 17 (6-37) twice daily syndrome 10 mg VTE prevention 125 (91-196) 9 (1-38) once daily after total hip replacement 15 mg Stroke prevention 229 (178-313) 57 (18-136) once daily in patients with AF (CR-CL 30-49 mL/min) 20 mg DVT treatment 270 (189-419) 26 (6-87) once daily 20 mg Stroke prevention 249 (184-343) 44 (12-137) once daily in patients with AF (CR-CL ≥50 mL/min) (a) Defined as samples collected 2-4 hours after dosing (b) Defined as samples collected 20-28 hours after dosing AF-atrial fibrillation, CR-CL-creatinine clearance, DVT-deep vein thrombosis, VTE-venous thromboembolism	Chromogenic measurement at 405nm.	**1.** Package insert: Rivaroxaban: Diagnostica Stago. Revised December 2014 **2.** Mueck W, Stampfuss J, Kubitza D, Becka M: Clinical pharmacokinetic and pharmacodynamic profile of rivaroxaban. Clinical Pharmacokinetics 2014; 53(1):1-16 doi: 10.1007/s40262-013-0100-7 **3.** Bayer Pharma AG. Xarelto (rivaroxaban) Summary of Product Characteristics; 2013. Available at: www.ema.europa.eu/docs/en_GB/document_library/EPAR_-_Product_Information/human/000944/WC500057108.pdf **4.** EINSTEIN Investigators, Bauersachs R, Berkowitz SD, et al: Oral rivaroxaban for symptomatic venous thromboembolism. N Engl J Med 2010; 363:2499-510 **5.** EINSTEIN-PE Investigators, Buller HR, Prins MH, et al: Oral rivaroxaban for the treatment of symptomatic pulmonary embolism. N Engl J Med 2012; 366:1287-1297 **6.** Patel MR, Mahaffey KW, Garg J, et al: Rivaroxaban versus warfarin in nonvalvular atrial fibrillation. N Engl J Med 2011; 365:883891 **7.** Siegal DM, Curnutte JT, Connolly SJ, et al: Andexanet alfa for reversal of factor Xa inhibitor activity. N Engl J Med 2015; 373:2413-2424 **8.** Martin K, Beyer-Westendorf J, Davidson BL, et al: Use of the direct oral anticoagulants in obese patients: guidance from the SSC of the ISTH. J Thromb Haemost 2016;14:1308-1313	25-500 ng/mL	25-500 ng/mL
Anti Xa Heparin (Unfractionated)	0.30-0.70 IU/mL			Chromogenic measurement at 405nm.	Chest, vol. 119, issue 1, January 2001, pge. 64S-75S.	0.10-0.80 IU/mL	0.10-1.60 IU/mL
Anti Xa LMWH (Enoxaparin) Random	0.60-1.00 Anti-Xa IU/mL			Chromogenic measurement at 405nm.	Chest, vol. 119, issue 1, January 2001, pge. 64S-75S.	0.10-1.60 Anti-Xa IU/mL	0.10-1.60 Anti-Xa IU/mL
Anti Xa LMWH (Enoxaparin), *Exact Time Required* 4 Hr Post	0.00-1.00 Anti-Xa IU/mL			Chromogenic measurement at 405nm.	Chest, vol. 119, issue 1, January 2001, pge. 64S-75S.	0.10-1.60 Anti-Xa IU/mL	0.10-1.60 Anti-Xa IU/mL
Antithrombin III	0-4 days: 39-87 % 5-29 days: 41-93 % 30-89 days: 48-108 % 90-179 days: 73-121 % 180-365 days: 84-124 % 1-5 years: 82-139 % 6-10 years: 90-131 % 11-16 years: 77-132 % 17+ years: 85-118 %			Chromogenic measurement at 405nm.	OSUWMC Normal Range Study 02/2004; Blood, Vol 80, 1998-2005, Andrew, 1992; Amer. Jour. Ped. Hematol. Oncol, Vol 12, 95-104, Andrew, 1990		9-200 %
Beta-2 Glycoprotein 1 Ab, IgG & IgM	**B2GP1G** 0.0-20.0 CU **B2GP1M** 0.0-20.0 CU			Chemiluminescent two-step immunoassay.	Inova Quanta-Flash Package Insert Verified in House	B2GP1G: 10.0-500.0 CU B2GP1M: 10.0-200.0 CU	B2GP1G: 10.0-10,000.0 CU B2GP1M: 10.0-4,000.0 CU
D-Dimer, Quantitative	<0.50 mcg/mL FEU			A suspension of latex microparticles, coated by covalent bonding with monoclonal antibodies specific for D-dimer, is mixed with the test plasma whose D-dimer level is to be assayed. Agglutination of the microparticles results via an antigen-antibody reaction, which induces an increase in turbidity of the reaction medium. This increase in turbidity is reflected by an increase in absorbance, the latter being measured photometrically at 540 nm. The increase in absorbance is a function of the D-dimer level present in the test sample.	OSUWMC Normal Range Study (08/2007)	0.27-4.00 mcg/mL FEU	0.27-20.00 mcg/mL FEU
DIC Workup	**PT** 11.9-14.2 sec **INR**			**PT, PTT, Mixing Studies, FIB, TT:** Mechanical Clot Detection **D-Dimer:** Optical measurement at 540 nm	See individual analytes	See individual analytes	See individual analytes

Factor II Activity	0-4 days: 26-70 % Activity 5-29 days: 33-93 % Activity 30-89 days: 34-102 % Activity 90-179 days: 45-105 % Activity 180-365 days: 60-116 % Activity 1-5 years: 71-116 % Activity 6-10 years: 67-107 % Activity 11-16 years: 61-104 % Activity 17+ years: 60-150 % Activity		1 stage clotting assay.	Clinical Guide to Laboratory Tests, Tietz, 1995; Blood, Vol 80, 1998-2005, Andrew, 1992; Blood, Vol 70, 165-172, Andrew, 1987	3-500 % Activity	3-500 % Activity
Factor II Inhibitor	0.0 Bethesda units	Negative	Bethesda method using a 1 stage clotting assay.			≥0.0 Bethesda units Negative, Positive
Factor IX Activity	0-4 days: 15-91 % Activity 5-29 days: 15-91 % Activity 30-89 days: 21-81 % Activity 90-179 days: 21-113 % Activity 180-365 days: 36-136 % Activity 1-5 years: 47-104 % Activity 6-10 years: 63-89 % Activity 11-16 years: 59-122 % Activity 17+ years: 73-147 % Activity	<1%: severe hemophilia 1- <5%: moderate hemophilia 5- <40%: mild hemophilia	1 stage clotting assay.	OSUWMC Normal Range Study 02/2004; Blood, Vol 80, 1998-2005, Andrew, 1992; Blood, Vol 70, 165-172, Andrew, 1987	1-500 % Activity	1-500 % Activity
Factor IX Inhibitor	0.0 Bethesda units	Negative	Bethesda method using a 1 stage clotting assay.			≥0.0 Bethesda units Negative, Positive
Factor V Activity	0-4 days: 34-108 % Activity 5-29 days: 45-145 % Activity 30-89 days: 62-134 % Activity 90-179 days: 48-132 % Activity 180-365 days: 55-127 % Activity 1-5 years: 79-127 % Activity 6-10 years: 63-116 % Activity 11-16 years: 55-99 % Activity 17+ years: 50-150 % Activity		1 stage clotting assay.	Clinical Guide to Laboratory Tests, Tietz, 1995; Blood, Vol 80, 1998-2005, Andrew, 1992; Blood, Vol 70, 165-172, Andrew, 1987	3-500 % Activity	3-500 % Activity
Factor V Inhibitor	0.0 Bethesda units	Negative	Bethesda method using a 1 stage clotting assay.			≥0.0 Bethesda units Negative, Positive
Factor VII Activity	0-4 days: 28-104 % Activity 5-29 days: 35-143 % Activity 30-89 days: 42-138 % Activity 90-179 days: 39-143 % Activity 180-365 days: 47-127 % Activity 1-5 years: 55-116 % Activity 6-10 years: 52-120 % Activity 11-16 years: 58-115 % Activity 17+ years: 65-135 % Activity		1 stage clotting assay.	Clinical Guide to Laboratory Tests, Tietz, 1995; Blood, Vol 80, 1998-2005, Andrew, 1992; Blood, Vol 70, 165-172, Andrew, 1987	3-1,000 % Activity	3-1,000 % Activity
Factor VII Inhibitor	0.0 Bethesda units	Negative	Bethesda method using a 1 stage clotting assay.			≥0.0 Bethesda units Negative, Positive
Factor VIII Activity	0-4 days: 50-178 % Activity 5-29 days: 50-154 % Activity 30-89 days: 50-157 % Activity 90-179 days: 50-125 % Activity 180-365 days: 50-109 % Activity 1-5 years: 59-142 % Activity 6-10 years: 58-132 % Activity 11-16 years: 53-131 % Activity 17+ years: 50-200 % Activity	<1%: severe hemophilia 1- <5%: moderate hemophilia 5- <40%: mild hemophilia	1 stage clotting assay.	Clinical Laboratory Reference Values. In: Lapsouta M, eds. *Laboratory Medicine: The Diagnosis of Disease in the Clinical Laboratory*. McGraw-Hill Education; 2014; Blood, Vol 80, 1998-2005, Andrew, 1992; Blood, Vol 70, 165-172, Andrew, 1987	1-500 % Activity	1-500 % Activity
Factor VIII Activity, Chromogenic	2-5 years: 59-142 % Activity 6-10 years: 58-132 % Activity 11-16 years: 53-131 % Activity	<1%: severe hemophilia 1- <5%: moderate hemophilia 5- <40%: mild hemophilia	Two stage chromogenic assay, measurement at 405nm.	Clinical Laboratory Reference Values. In: Lapsouta M, eds. *Laboratory Medicine: The Diagnosis of Disease in the Clinical Laboratory*. McGraw-Hill Education; 2014; Blood, Vol 80, 1998-2005, Andrew, 1992; Blood, Vol 70, 165-172, Andrew, 1987	1-200 % Activity	1-200 % Activity
Factor VIII Inhibitor	0.0 Bethesda units	Negative	Bethesda method using a 1 stage clotting assay.			≥0.0 Bethesda units Negative, Positive
Factor X Activity	0-4 days: 12-68 % Activity 5-29 days: 19-78 % Activity 30-89 days: 31-87 % Activity 90-179 days: 35-107 % Activity 180-365 days: 38-118 % Activity 1-5 years: 58-116 % Activity 6-10 years: 55-101 % Activity 11-16 years: 50-117 % Activity 17+ years: 60-130 % Activity		1 stage clotting assay.	Clinical Guide to Laboratory Tests, Tietz, 1995; Blood, Vol 80, 1998-2005, Andrew, 1992; Blood, Vol 70, 165-172, Andrew, 1987	3-500 % Activity	3-500 % Activity
Factor X Inhibitor	0.0 Bethesda units	Negative	Bethesda method using a 1 stage clotting assay.			≥0.0 Bethesda units Negative, Positive
Factor XI Activity	0-4 days: 10-66 % Activity 5-29 days: 23-87 % Activity 30-89 days: 27-79 % Activity 90-179 days: 41-97 % Activity 180-365 days: 49-134 % Activity 1-5 years: 56-150 % Activity 6-10 years: 52-120 % Activity 11-16 years: 50-97 % Activity 17+ years: 65-135 % Activity		1 stage clotting assay.	Clinical Guide to Laboratory Tests, Tietz, 1995; Blood, Vol 80, 1998-2005, Andrew, 1992; Blood, Vol 70, 165-172, Andrew, 1987	1-500 % Activity	1-500 % Activity
Factor XI Inhibitor	0.0 Bethesda units	Negative	Bethesda method using a 1 stage clotting assay.			≥0.0 Bethesda units Negative, Positive
Factor XIII Activity		Present	Clot solubility.			Absent, Present
Fibrinogen, Clottable	220-410 mg/dL		Mechanical clot detection of dilute plasma in the presence of excess thrombin.	OSU Lab Normal Range Study (05/2003)	60-900 mg/dL	60-900 mg/dL
Fibrinogen, Obstetrical	OB 1st Trimester: 244-510 mg/dL OB 2nd Trimester: 291-538 mg/dL OB 3rd Trimester: 373-619 mg/dL	Fibrinogen levels may be altered by the normal physiologic changes of pregnancy and should be interpreted considering reference ranges specific to gestational age.	Mechanical clot detection of dilute plasma in the presence of excess thrombin.	Reference: Abbassi-Ghanavati M, Greer LG, Cunningham FG. Pregnancy and laboratory studies: a reference table for clinicians. Obstet Gynecol 2009; 114:1326.	60-900 mg/dL	60-900 mg/dL
Heparin Platelet Factor 4 (HIT Screen) with Reflex to (SRA)	PF4 IgG OD: <0.400		Enzyme-linked immunosorbent assay (ELISA), IgG.	Immucor LIFECODES® PF4 IgG Assay Package Insert	PF4 IgG OD: 0.000-3.000	PF4 IgG OD: 0.000-3.000
Lupus Anticoagulant	**PT** 11.9-14.2 sec **INR** 0.9-1.1 **TT** 13.0-20.0 sec **PTT-LA** ≤43.6 sec		**Hexagonal PL Neutralization:** STACLOT-LA: Mechanical clot detection in the presence/absence of hexagonal ring phospholipid **DRVVT:** Mechanical clot detection in the presence of Diluted Russell's Viper Venom **PTT-LA:** Mechanical clot detection in the presence of cephalin and activator **PT, TT, Mixing Studies:** Mechanical clot detection	OSUWMC Normal Range Study	PT: See individual analyte TT: See individual analyte PTT-LA: 20.0-180.0 sec	PT: See individual analyte TT: See individual analyte PTT-LA: 20.0-180.0 sec
Platelet Aggregation	Aggregation w/ADP 5 nmol/L: 67-92 % Aggregation Aggregation w/ADP 10.0 nmol/L: 73-91 % Aggregation Aggregation w/Arach Acid 0.5 mmol/L: 72-91 % Aggregation Aggregation w/Epinephrine 5 nmol/L: 64-105 % Aggregation Aggregation w/Ristocetin 0.5 mg/mL: 0-6 % Aggregation Aggregation w/Ristocetin 1.25 mg/mL: 70-105 % Aggregation Aggregation w/Collagen 2 ug/mL: 80-96 % Aggregation Aggregation w/Collagen 5 ug/mL: 71-92 % Aggregation Aggregation w/TXA 2.9 nmol/L: 73-112 % Aggregation ATP Release w/ Collagen 2 ug/mL: 0.26-1.07 nmol ATP Release w/ Collagen 5 ug/mL: 0.49-1.32 nmol ATP Release w/Arach Acid 0.5 mmol/L: 0.37-0.90 nmol ATP Release w/ADP 5 nmol/L: 0.28-0.93 nmol ATP Release w/ADP 10 nmol/L: 0.44-1.19 nmol ATP Release w/Thrombin IU: 0.36-0.99 nmol ATP Release w/Epinephrine 5 nmol/L: 0.35-0.96 nmol		Born method of turbidimetric aggregation with simultaneous measurement of ATP release by platelet lumi-aggregometry.	OSUWMC Normal Range Study (02-2023)		
Platelet Function Test	Collagen / Epi Closure Time: 73-172 sec Collagen / ADP Closure Time: 53-111 sec		Instrument PFA-100 closure time: the time measured from the start of the test until a platelet to close aperture after exposure to agonist.	OSU Normal Range Study (07/2004)	Collagen / Epi Closure Time: 31-300 sec Collagen / ADP Closure Time: 31-300 sec	Collagen / Epi Closure Time: 31-300 sec Collagen / ADP Closure Time: 31-300 sec
Platelet P2Y12 Inhibition Test	194-418 PRU	Test results are reported in P2Y12 Reaction Units (PRU). The pre-drug Normal Reference Range is 194 - 418 PRU. PRU measures the extent of platelet aggregation in the presence of P2Y12 inhibitor drugs such as clopidogrel (Plavix), prasugrel (Effient), ticlopidine (Ticlid), and ticagrelor (Brilinta).	Whole blood platelet aggregometry based on the ability of activated platelets to bind fibrinogen. Fibrinogen-coated microparticles aggregate in whole blood in proportion to the number of expressed platelet GP IIb/IIIa receptors.	Accriva Diagnostics Verify Now P2Y12 Package Insert VN10098WEU	6-999 PRU	6-999 PRU
Protein C Activity	0-4 days: 17-53 % Activity 5-29 days: 20-64 % Activity 30-89 days: 21-65 % Activity 90-179 days: 28-80 % Activity 180-365 days: 37-81 % Activity 1-5 years: 56-150 % Activity 6-10 years: 40-92 % Activity 11-16 years: 55-111 % Activity 17+ years: 72-220 % Activity		This clotting assay measures Protein C which is activated in the presence of the specific activator extracted from Agkistrodon c. contortrix venom. The resulting activated protein C inhibits the factors V and VIII, and thus prolongs the APTT of a system in which all the factors are present, constant and in excess (provided by the test system), except for the protein C which is derived from the sample being tested	OSUWMC Normal Range Study; Blood, Vol 80, 1998-2005, Andrew, 1992; Amer. Jour. Ped. Hematol. Oncol, Vol 12, 95-104, Andrew, 1990		10-300 % Activity

Protein S Activity	0-4 days: 12-60 % Activity 5-29 days: 22-78 % Activity 30-89 days: 33-93 % Activity 90-179 days: 54-118 % Activity 180-365 days: 55-119 % Activity 1-5 years: 53-173 % Activity 6-10 years: 55-155 % Activity 11-16 years: 65-138 % Activity 17+ years: 50-168 % Activity		Clotting assay based on the cofactor activity of protein S which enhances the anticoagulant action of activated protein C. This enhancement is reflected by the prolongation of the clotting time of a system enriched with factor Va which is a physiological substrate for activated protein C.	OSUWMC Normal Range Study; Blood, Vol 80, 1998-2005, Andrew, 1992; Amer. Jour. Ped. Hematol. Oncol, Vol 12, 95-104, Andrew, 1990		10-300 % Activity
Protime - INR	**PT** 11.9-14.2 sec **INR** 0.9-1.1		**PT:** Mechanical clot detection initiated by Calcium Thromboplastin **INR:** Calculation	OSUWMC Normal Range Study	PT: 7.0-111.0 sec INR: 0.5-14.9	PT: 7.0-111.0 sec INR: 0.5-14.9
PT and PT Mixing Study	**PT** 11.9-14.2 sec **INR** 0.9-1.1		**PT:** Mechanical clot detection initiated by Calcium Thromboplastin **INR:** Calculation **PT Mixing Study:** PT performed immediately		PT: 7.0-111.0 sec INR: 0.5-14.9	PT: 7.0-111.0 sec INR: 0.5-14.9
PT, INR, PTT	**PT** 11.9-14.2 sec **INR** 0.9-1.1		**PT, PTT:** Mechanical clot detection **INR:** Calculation	See individual analytes	See individual analytes	See individual analytes
PT INR - Stroke	**PT** 11.9-14.2 sec		**PT, PTT:** Mechanical clot detection **INR:** Calculation	OSUWMC Normal Range Study	PT: 7.0-111.0 sec INR: 0.5-14.9	PT: 7.0-111.0 sec INR: 0.5-14.9
PTT	24.0-34.3 sec		Mechanical clot detection initiated by Calcium in the presence of cephalin (platelet substitute) and a particulate activator (silica).	OSUWMC Normal Range Study	20.0-180.0 sec	20.0-180.0 sec
PTT with Mixing Study	24.0-34.3 sec		**PTT:** Mechanical clot detection initiated by Calcium in the presence of cephalin (platelet substitute) and a particulate activator (silica). **PTT Mixing Study:** PTT performed immediately subsequent to 1:1 mix with normal plasma pool.		20.0-180.0 sec	20.0-180.0 sec
ROTEM Lab: Heparin Panel	INTEM CT: 122-208 sec INTEM CFT: 45-110 sec INTEM ALPHA: 70-81 degree INTEM A20: 51-72 mm INTEM MCF: 51-72 mm EXTEM CT: 43-82 sec EXTEM CFT: 48-127 sec EXTEM ALPHA: 65-80 degree EXTEM A20: 50-70 mm EXTEM MCF: 52-70 mm FIBTEM A20: 7-21 mm FIBTEM MCF: 7-21 mm Reference ranges are not available for all ROTEM components unless otherwise noted: Interpretation of ROTEM results must include all available parameters, patient clinical context and current therapy. Interpretation of the HEPTEM results must include clinical correlation between the INTEM and the HEPTEM data. All results should be interpreted carefully based on patient clinical context and current therapy. Interpretation of APTEM results (fibrinolytic activity) must include correlation between the EXTEM and APTEM data. All results should be interpreted carefully based on patient clinical context and current therapy.		Rotem Physician Advice	Rotational Viscoelastic Testing- Rotem Delta: The patented ROTEM technology is based on a fixed cylindrical cup and a permanently oscillating vertical axis. The axis is supported by a high precision ball bearing and oscillates to the left and to the right through an angle of 4.75°.	Normal Range Study 2013		
ROTEM Lab: Routine Panel	INTEM CT: 122-208 sec INTEM CFT: 45-110 sec INTEM ALPHA: 70-81 degree INTEM A20: 51-72 mm INTEM MCF: 51-72 mm INTEM ML: No reference range available; see comment INTEM LI30: No reference range available; see comment EXTEM CT: 43-82 sec EXTEM CFT: 48-127 sec EXTEM ALPHA: 65-80 degree EXTEM A20: 50-70 mm EXTEM MCF: 52-70 mm FIBTEM A20: 7-21 mm FIBTEM MCF: 7-21 mm Reference ranges are not available for all ROTEM components unless otherwise noted: Interpretation of ROTEM results must include all available parameters, patient clinical context and current therapy. Interpretation of APTEM results (fibrinolytic activity) must include correlation between the EXTEM and APTEM data. All results should be interpreted carefully based on patient clinical context and current therapy.		Rotem Physician Advice	Rotational Viscoelastic Testing- Rotem Delta: The patented ROTEM technology is based on a fixed cylindrical cup and a permanently oscillating vertical axis. The axis is supported by a high precision ball bearing and oscillates to the left and to the right through an angle of 4.75°.	Normal Range Study 2013		
ROTEM Lab: Trauma Panel	EXTEM CT: 43-82sec EXTEM CFT: 48-127 sec EXTEM ALPHA: 65-80 degree EXTEM A20: 50-70 mm EXTEM MCF: 52-70 mm FIBTEM A20: 7-21 mm FIBTEM MCF: 7-21 mm Reference ranges are not available for all ROTEM components unless otherwise noted: Interpretation of ROTEM results must include all available parameters, patient clinical context and current therapy. Interpretation of APTEM results (fibrinolytic activity) must include correlation between the EXTEM and APTEM data. All results should be interpreted carefully based on patient clinical context and current therapy.		Rotem Physician Advice	Rotational Viscoelastic Testing- Rotem Delta: The patented ROTEM technology is based on a fixed cylindrical cup and a permanently oscillating vertical axis. The axis is supported by a high precision ball bearing and oscillates to the left and to the right through an angle of 4.75 °.	Normal Range Study 2013		
Thrombin Time	13.0-20.0 sec		Mechanical clot detection of undiluted plasma in the presence of a predetermined quantity of thrombin, resulting in a fibrin clot.	OSUWMC Normal Range Study	10.0-120.0 sec	10.0-120.0 sec
Thrombin Time w/ Mixing Studies	13.0-20.0 sec		**TT:** Mechanical clot detection of undiluted plasma in the presence of a predetermined quantity of thrombin, resulting in a fibrin clot. **TT Mixing Study:** Thrombin Time is performed subsequent to a 1:1 mix with normal plasma pool and also in the presence of protamine sulfate (if indicated).	OSUWMC Normal Range Study	10.0-120.0 sec	10.0-120.0 sec
Von Willebrand Battery Ags + Factor VIII	**PTT** 24.0-34.3 sec **FA8** 0-4 days: 50-178 % Activity 5-29 days: 50-154 % Activity 30-89 days: 50-157 % Activity 90-179 days: 50-125 % Activity 180-365 days: 50-109 % Activity 1-5 years: 59-142 % Activity 6-10 years: 58-132 % Activity 11-16 years: 53-131 % Activity 17+ years: 50-200 % Activity **VWFAC** 50-203% Activity **VWFAG** 0-4 days: 50-287 % 5-29 days: 50-254 % 30-89 days: 50-246 % 90-179 days: 50-206 % 180-365 days: 50-197 % 1-5 years: 60-120 % 6-10 years: 44-144 % 11-16 years: 46-153 % 17+ years: 86-180 %		**PTT:** Mechanical clot detection initiated by Calcium in the presence of cephalin (platelet substitute) and a particulate activator (silica). **VWF Ag:** Immuno-turbidimetric method (STA - Liatest VWF:Ag) **Factor VIII:** One Stage Clotting Assay **VWF Activity:** Latex turbidimetric immunoassay (Siemens Innovancell vWF Ac)	See individual analytes	See individual analytes	See individual analytes

Von Willebrand Factor Ag	0-4 days: 50-287 % 5-29 days: 50-334 % 30-89 days: 50-246 % 90-179 days: 50-206 % 180-365 days: 50-197 % 1-5 years: 60-120 % 6-10 years: 44-144 % 11-16 years: 46-153 % 17+ years: 50-180 %		Immuno-turbidimetric method (STA – Liatest VWF:Ag)	OSUWMC Normal Range Study; Blood, Vol 80, 1998-2005, Andrew, 1992; Blood, Vol 70, 165-172, Andrew, 1987		3-400 %
Von Willebrand Factor GP1bM Activity	50-203 % Activity		Latex turbidimetric immunoassay (Siemens Innovance® vWF Ac)	Siemens Healthineers Innovance® VWF Ac Package Insert		4-300 % Activity
Amikacin Level, Extended Interval	Peak: 30-60 mcg/mL, Trough: <6 mcg/mL		Homogeneous particle-enhanced turbidimetric immunoassay.	OSU Pharmacy	3.0-50.0 mcg/mL	3.0-150.0 mcg/mL
Amikacin Level, Peak (Post Drug Level)	Therapeutic Range: 30.0-60.0 mcg/mL		Homogeneous particle-enhanced turbidimetric immunoassay.	OSU Pharmacy	3.0-50.0 mcg/mL	3.0-150.0 mcg/mL
Amikacin Level, Random	Peak: 30-60 mcg/mL, Trough: <6 mcg/mL		Homogeneous particle-enhanced turbidimetric immunoassay.	OSU Pharmacy	3.0-50.0 mcg/mL	3.0-150.0 mcg/mL
Amikacin Level, Trough (Pre Drug Level)	Therapeutic Range: <6.0 mcg/mL		Homogeneous particle-enhanced turbidimetric immunoassay.	OSU Pharmacy	3.0-50.0 mcg/mL	3.0-150.0 mcg/mL
Amphetamines, Urine, Confirmation	None Detected Cutoff concentrations by liquid chromatography-tandem mass spectrometry: Amphetamine: 25 ng/mL Methamphetamine: 25 ng/mL	Numeric results (positive) indicate the measured concentration of drug in the urine sample. Negative results may reflect the absence of drug or drug present below the assay's limit of quantitation. The detection of drugs in urine is dependent on several factors including the amount of drug ingested, time since exposure, individual metabolism, kidney and liver function, urine concentration, and the assay's limit of detection. Drug concentrations in urine cannot determine the dose, route of administration, or exact time of exposure.	Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)		Amphetamine: 25-2,000 ng/mL Methamphetamine: 25-5,000 ng/mL	Amphetamine: 25-20,000 ng/mL Methamphetamine: 25-50,000 ng/mL
Benzodiazepines, Urine, Confirmation	None Detected Cutoff concentrations by liquid chromatography-tandem mass spectrometry: 2-Hydroxyethylflurazepam: 50 ng/mL 7-Aminoclonazepam: 10 ng/mL 7-Aminoflunitrazepam: 10 ng/mL Alpha-hydroxyalprazolam: 10 ng/mL Alpha-hydroxymidazolam: 10 ng/mL Alprazolam: 10 ng/mL Diazepam: 10 ng/mL Flurazepam: 10 ng/mL Midazolam: 10 ng/mL Nordiazepam: 10 ng/mL Temazepam: 10 ng/mL Clonazepam: 25 ng/mL Lorazepam: 25 ng/mL Oxazepam: 25 ng/mL	Numeric results (positive) indicate the measured concentration of drug in the urine sample. Negative results may reflect the absence of drug or drug present below the assay's limit of quantitation. The detection of drugs in urine is dependent on several factors including the amount of drug ingested, time since exposure, individual metabolism, kidney and liver function, urine concentration, and the assay's limit of detection. Drug concentrations in urine cannot determine the dose, route of administration, or exact time of exposure.	Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)		2-Hydroxyethylflurazepam: 50-1,750 ng/mL 7-Aminoclonazepam: 10-1,000 ng/mL 7-Aminoflunitrazepam: 10-1,300 ng/mL Alpha-hydroxyalprazolam: 10-2,000 ng/mL Alpha-hydroxymidazolam: 10-1,750 ng/mL Alprazolam: 10-2,000 ng/mL Diazepam: 10-2,000 ng/mL Flurazepam: 10-1,000 ng/mL Midazolam: 10-2,000 ng/mL Nordiazepam: 10-2,000 ng/mL Temazepam: 10-2,000 ng/mL Clonazepam: 25-2,000 ng/mL Lorazepam: 25-2,000 ng/mL Oxazepam: 25-2,000 ng/mL	2-Hydroxyethylflurazepam: 50-1,750 ng/mL 7-Aminoclonazepam: 10-1,000 ng/mL 7-Aminoflunitrazepam: 10-1,300 ng/mL Alpha-hydroxyalprazolam: 10-2,000 ng/mL Alpha-hydroxymidazolam: 10-1,750 ng/mL Alprazolam: 10-2,000 ng/mL Diazepam: 10-2,000 ng/mL Flurazepam: 10-1,000 ng/mL Midazolam: 10-2,000 ng/mL Nordiazepam: 10-2,000 ng/mL Temazepam: 10-2,000 ng/mL Clonazepam: 25-2,000 ng/mL Lorazepam: 25-2,000 ng/mL Oxazepam: 25-2,000 ng/mL
Buprenorphine and Norbuprenorphine, Urine, Confirmation	None Detected Cutoff concentrations by liquid chromatography-tandem mass spectrometry: Buprenorphine: 5.0 ng/mL Norbuprenorphine: 5.0 ng/mL	Numeric results (positive) indicate the measured concentration of drug in the urine sample. Negative results may reflect the absence of drug or drug present below the assay's limit of quantitation. The detection of drugs in urine is dependent on several factors including the amount of drug ingested, time since exposure, individual metabolism, kidney and liver function, urine concentration, and the assay's limit of detection. Drug concentrations in urine cannot determine the dose, route of administration, or exact time of exposure.	Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)		Buprenorphine: 5.0-2,000.0 ng/mL Norbuprenorphine: 10.0-5,000.0 ng/mL Naloxone: 100-5,000 ng/mL	Buprenorphine: 5.0-20,000.0 ng/mL Norbuprenorphine: 10.0-50,000.0 ng/mL Naloxone: 100-50,000 ng/mL
Carboxy THC, Urine Confirmation	None Detected Cutoff concentrations by gas chromatography-tandem mass spectrometry: 9-Carboxy-11-Nor-Delta-THC: 5.0 ng/mL	Numeric results (positive) indicate the measured concentration of drug in the urine sample. Negative results may reflect the absence of drug or drug present below the assay's limit of quantitative. The detection of drugs in urine is dependent on several factors including the amount of drug ingested, time since exposure, individual metabolism, kidney and liver function, urine concentration, and the assay's limit of detection. Drug concentrations in urine cannot determine the dose, route of administration, or exact time of exposure.	Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)		5.0-500.0 ng/mL	5.0-500.0 ng/mL
Cocaine, Urine, Confirmation	None Detected Cutoff concentrations by liquid chromatography-tandem mass spectrometry: Benzoylecgonine: 25 ng/mL Cocaine: 25 ng/mL	Numeric results (positive) indicate the measured concentration of drug in the urine sample. Negative results may reflect the absence of drug or drug present below the assay's limit of quantitation. The detection of drugs in urine is dependent on several factors including the amount of drug ingested, time since exposure, individual metabolism, kidney and liver function, urine concentration, and the assay's limit of detection. Drug concentrations in urine cannot determine the dose, route of administration, or exact time of exposure.	Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)		Benzoylecgonine: 25-5,000 ng/mL Cocaine: 25-5,000 ng/mL	Benzoylecgonine: 25-5,000 ng/mL Cocaine: 25-5,000 ng/mL
Cotinine, Urine, Confirmation	None Detected Cutoff concentrations by liquid chromatography-tandem mass spectrometry: <5 ng/mL	Numeric results (positive) indicate the measured concentration of drug in the urine sample. Negative results may reflect the absence of drug or drug present below the assay's limit of quantitation. The detection of drugs in urine is dependent on several factors including the amount of drug ingested, time since exposure, individual metabolism, kidney and liver function, urine concentration, and the assay's limit of detection. Drug concentrations in urine cannot determine the dose, route of administration, or exact time of exposure.	Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)		5-5,000 ng/mL	5-5,000 ng/mL
Cyclosporine Level, 2HR	Therapeutic Range: 320-960 ng/mL		Chemiluminescent microparticle immunoassay	OSU Pharmacy	30-1,500 ng/mL	30-3,000 ng/mL
Cyclosporine Level, Random	**Kidney/Pancreas Transplant:** 0 to 3 months: 800-1000 ng/mL 3 to 12 months: 600-800 ng/mL >12 months: 400-600 ng/mL		Chemiluminescent microparticle immunoassay	OSU Pharmacy	30-1,500 ng/mL	30-3,000 ng/mL
Cyclosporine Level, Trough (Pre Drug Level)	**Kidney/Pancreas Transplant:** 0 to 3 months: 800-1000 ng/mL 3 to 12 months: 600-800 ng/mL >12 months: 400-600 ng/mL **Aplastic anemia and stem cell transplant:** 200-400		Chemiluminescent microparticle immunoassay	OSU Pharmacy	30-1,500 ng/mL	30-3,000 ng/mL
Ethanol (Alcohol), Urine	<10 mg/dL	Detectable ethanol in urine indicates exposure to ethanol within the past 8-12 hours.	Beckman Coulter DxC700AU; Emit® II Plus Ethyl Alcohol Assay		10-600 mg/dL	10-600 mg/dL
Ethylene Glycol, Blood, Screen with Reflex to Confirmation	Negative Cutoff concentrations by gas chromatography: 10 mg/dL		**Screen:** Beckman Coulter DxC700AU: Catachem DiscretPak Ethylene Glycol Reagent Kit **Confirmation**: Gas Chromatography Flame Ionization Detection (GC-FID)		CONFIRMATION: 10-250 mg/dL	SCREEN: Negative, Presumptive Positive. Confirmation to follow. CONFIRMATION: 10-250 mg/dL
Everolimus, Trough (Pre Drug Level)	**Kidney/Pancreas Transplant:** 0 to 3 months: 7-10 ng/mL 3 to 12 months: 5-8 ng/mL >12 months: 4-8 ng/mL		Particle enhanced turbidimetric immunoassay	OSU Pharmacy	2.0-20.0 ng/mL	2.0-40.0 ng/mL
Fentanyl, Urine, Confirmation	None Detected Cutoff concentrations by liquid chromatography-tandem mass spectrometry: Fentanyl: 2.5 ng/mL Norfentanyl: 2.5 ng/mL	Numeric results (positive) indicate the measured concentration of drug in the urine sample. Negative results may reflect the absence of drug or drug present below the assay's limit of quantitation. The detection of drugs in urine is dependent on several factors including the amount of drug ingested, time since exposure, individual metabolism, kidney and liver function, urine concentration, and the assay's limit of detection. Drug concentrations in urine cannot determine the dose, route of administration, or exact time of exposure.	Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)		Fentanyl: 1.0-750.0 ng/mL Norfentanyl: 2.5-2,000.0 ng/mL Xylazine: 5.0-2,000 ng/mL	Fentanyl: 1.0-750.0 ng/mL Norfentanyl: 2.5-2,000.0 ng/mL Xylazine: 5.0-2,000 ng/mL
Gabapentin, Urine	None Detected Cutoff concentrations by liquid chromatography-tandem mass spectrometry: <100 ng/mL	Numeric results (positive) indicate the measured concentration of drug in the urine sample. Negative results may reflect the absence of drug or drug present below the assay's limit of quantitation. The detection of drugs in urine is dependent on several factors including the amount of drug ingested, time since exposure, individual metabolism, kidney and liver function, urine concentration, and the assay's limit of detection. Drug concentrations in urine cannot determine the dose, route of administration, or exact time of exposure.	Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)		100-10,000 ng/mL	100-10,000 ng/mL
Gentamicin Level, Extended Infusion	Peak: 3-15.0 mcg/mL, Trough: ≤1.0 mcg/mL		Enzyme immunoassay		0.3-10.0 mcg/mL	0.3-20.0 mcg/mL
Gentamicin Level, Peak (Post Drug Level)	Therapeutic Range: 3.0-15.0 mcg/mL		Enzyme immunoassay	OSU Pharmacy	0.3-10.0 mcg/mL	0.3-20.0 mcg/mL
Gentamicin Level, Random	Peak: 3-15.0 mcg/mL, Trough: ≤1.0 mcg/mL		Enzyme immunoassay		0.3-10.0 mcg/mL	0.3-20.0 mcg/mL
Gentamicin, Trough (Pre Drug Level)	0-365 days: Therapeutic Range: <1.6 mcg/mL		Enzyme immunoassay	OSU Pharmacy	0.3-10.0 mcg/mL	0.3-20.0 mcg/mL
Ketamine, Urine	None Detected Cutoff concentrations by liquid chromatography-tandem mass spectrometry: <25 ng/mL	Numeric results (positive) indicate the measured concentration of drug in the urine sample. Negative results may reflect the absence of drug or drug present below the assay's limit of quantitation. The detection of drugs in urine is dependent on several factors including the amount of drug ingested, time since exposure, individual metabolism, kidney and liver function, urine concentration, and the assay's limit of detection. Drug concentrations in urine cannot determine the dose, route of administration, or exact time of exposure.	Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)		Ketamine: 25-5,000 ng/mL Norketamine: 25-5,000 ng/mL	Ketamine: 25-5,000 ng/mL Norketamine: 25-5,000 ng/mL
Lidocaine Level	Therapeutic Range: 1.5-5.0 mcg/mL		Enzyme immunoassay	OSU Pharmacy	0.5-12.0 mcg/mL	0.5-36.0 mcg/mL
Meperidine, Urine	None Detected Cutoff concentrations by liquid chromatography-tandem mass spectrometry: Meperidine: <25 ng/mL Normeperidine: <25 ng/mL	Numeric results (positive) indicate the measured concentration of drug in the urine sample. Negative results may reflect the absence of drug or drug present below the assay's limit of quantitation. The detection of drugs in urine is dependent on several factors including the amount of drug ingested, time since exposure, individual metabolism, kidney and liver function, urine concentration, and the assay's limit of detection. Drug concentrations in urine cannot determine the dose, route of administration, or exact time of exposure.	Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)		Meperidine: 25-5,000 ng/mL Normeperidine: 25-2,000 ng/mL	Meperidine: 25-5,000 ng/mL Normeperidine: 25-2,000 ng/mL

Methadone, Urine, Confirmation	None Detected Cutoff concentrations by liquid chromatography-tandem mass spectrometry: Methadone: 25 ng/mL EDDP Methadone: 25 ng/mL	Numeric results (positive) indicate the measured concentration of drug in the urine sample. Negative results may reflect the absence of drug or drug present below the assay's limit of quantitative. The detection of drugs in urine is dependent on several factors including the amount of drug ingested, time since exposure, individual metabolism, kidney and liver function, urine concentration, and the assay's limit of detection. Drug concentrations in urine cannot determine the dose, route of administration, or exact time of exposure.	Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)		Methadone: 25-5,000 ng/mL EDDP Methadone: 25-5,000 ng/mL	Methadone: 25-50,000 ng/mL EDDP Methadone: 25-50,000 ng/mL
Methylphenidate, Urine	None Detected Cutoff concentrations by liquid chromatography-tandem mass spectrometry: Methylphenidate: <10 ng/mL Ritalinic Acid: <25 ng/mL	Numeric results (positive) indicate the measured concentration of drug in the urine sample. Negative results may reflect the absence of drug or drug present below the assay's limit of quantitation. The detection of drugs in urine is dependent on several factors including the amount of drug ingested, time since exposure, individual metabolism, kidney and liver function, urine concentration, and the assay's limit of detection. Drug concentrations in urine cannot determine the dose, route of administration, or exact time of exposure.	Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)		Methylphenidate: 10-2,000 ng/mL Ritalinic Acid: 25-2,000 ng/mL	Methylphenidate: 10-20,000 ng/mL Ritalinic Acid: 25-20,000 ng/mL
Mitragynine (Kratom), Urine	None Detected Cutoff concentrations by liquid chromatography-tandem mass spectrometry: <10 ng/mL	Numeric results (positive) indicate the measured concentration of drug in the urine sample. Negative results may reflect the absence of drug or drug present below the assay's limit of quantitation. The detection of drugs in urine is dependent on several factors including the amount of drug ingested, time since exposure, individual metabolism, kidney and liver function, urine concentration, and the assay's limit of detection. Drug concentrations in urine cannot determine the dose, route of administration, or exact time of exposure.	Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)		10-500 ng/mL	10-500 ng/mL
Nalbuphine, Urine	None Detected Cutoff concentrations by liquid chromatography-tandem mass spectrometry: <25 ng/mL	Numeric results (positive) indicate the measured concentration of drug in the urine sample. Negative results may reflect the absence of drug or drug present below the assay's limit of quantitation. The detection of drugs in urine is dependent on several factors including the amount of drug ingested, time since exposure, individual metabolism, kidney and liver function, urine concentration, and the assay's limit of detection. Drug concentrations in urine cannot determine the dose, route of administration, or exact time of exposure.	Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)		25-5,000 ng/mL	25-5,000 ng/mL
Nicotine (Cotinine) Screen with Confirmation	None Detected Cutoff concentrations by immunoassay detection: 500 ng/mL	Numeric results (positive) indicate the measured concentration of drug in the urine sample. Negative results may reflect the absence of drug or drug present below the assay's limit of quantitation. The detection of drugs in urine is dependent on several factors including the amount of drug ingested, time since exposure, individual metabolism, kidney and liver function, urine concentration, and the assay's limit of detection. Drug concentrations in urine cannot determine the dose, route of administration, or exact time of exposure.	Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)			SCREEN: None Detected; Presumptive Positive; Presumptive Positive Confirmation to follow. CONFIRMATION: See individual reflex tests.
Nicotine Screen Urine	None Detected	Positive results indicate recent exposure to cigarette smoke.	Beckman Coulter DxC700AU Thermo Scientific DRI® Cotinine Assay			None Detected; Positive; Presumptive Positive. Confirmation to Follow.
Opioids, Urine, Confirmation	None Detected Cutoff concentrations by liquid chromatography-tandem mass spectrometry: 6-Monoacetylmorphine: 5.0 ng/mL Codeine: 25 ng/mL Hydrocodone: 25 ng/mL Hydromorphone: 25 ng/mL Morphine: 25 ng/mL Tramadol: 25 ng/mL	Numeric results (positive) indicate the measured concentration of drug in the urine sample. Negative results may reflect the absence of drug or drug present below the assay's limit of quantitation. The detection of drugs in urine is dependent on several factors including the amount of drug ingested, time since exposure, individual metabolism, kidney and liver function, urine concentration, and the assay's limit of detection. Drug concentrations in urine cannot determine the dose, route of administration, or exact time of exposure.	Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)		6-Monoacetylmorphine: 10.0-5,000.0 ng/mL Codeine: 25-5,000 ng/mL Hydrocodone: 25-5,000 ng/mL Hydromorphone: 25-5,000 ng/mL Morphine: 25-5,000 ng/mL	6-Monoacetylmorphine: 10.0-5,000.0 ng/mL Codeine: 25-50,000 ng/mL Hydrocodone: 25-50,000 ng/mL Hydromorphone: 25-50,000 ng/mL Morphine: 25-50,000 ng/mL
Oxycodone, Urine, Confirmation	None Detected Cutoff concentrations by liquid chromatography-tandem mass spectrometry: Oxycodone: 25 ng/mL Oxymorphone: 25 ng/mL Noroxycodone: 25 ng/mL	Numeric results (positive) indicate the measured concentration of drug in the urine sample. Negative results may reflect the absence of drug or drug present below the assay's limit of quantitation. The detection of drugs in urine is dependent on several factors including the amount of drug ingested, time since exposure, individual metabolism, kidney and liver function, urine concentration, and the assay's limit of detection. Drug concentrations in urine cannot determine the dose, route of administration, or exact time of exposure.	Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)		Oxycodone: 25-5,000 ng/mL Oxymorphone: 25-5,000 ng/mL Noroxycodone: 25-5,000 ng/mL	Oxycodone: 25-50,000 ng/mL Oxymorphone: 25-20,000 ng/mL Noroxycodone: 25-50,000 ng/mL
Phencyclidine (PCP), Urine, Confirmation	None Detected Cutoff concentrations by liquid chromatography-tandem mass spectrometry: <25 ng/mL	Numeric results (positive) indicate the measured concentration of drug in the urine sample. Negative results may reflect the absence of drug or drug present below the assay's limit of quantitation. The detection of drugs in urine is dependent on several factors including the amount of drug ingested, time since exposure, individual metabolism, kidney and liver function, urine concentration, and the assay's limit of detection. Drug concentrations in urine cannot determine the dose, route of administration, or exact time of exposure.	Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)		25-2,000 ng/mL	25-2,000 ng/mL
Phenytoin Free Level	Therapeutic Range: 0.6–2.4 mcg/mL		Chemiluminescent microparticle immunoassay	OSU Pharmacy	0.5-40.0 mcg/mL	0.5-40.0 mcg/mL
Pregabalin, Urine	None Detected Cutoff concentrations by liquid chromatography-tandem mass spectrometry: <100 ng/mL	Numeric results (positive) indicate the measured concentration of drug in the urine sample. Negative results may reflect the absence of drug or drug present below the assay's limit of quantitation. The detection of drugs in urine is dependent on several factors including the amount of drug ingested, time since exposure, individual metabolism, kidney and liver function, urine concentration, and the assay's limit of detection. Drug concentrations in urine cannot determine the dose, route of administration, or exact time of exposure.	Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)		100-10,000 ng/mL	100-10,000 ng/mL
Quetiapine, Urine	None Detected Cutoff concentrations by liquid chromatography-tandem mass spectrometry: <25 ng/mL	Numeric results (positive) indicate the measured concentration of drug in the urine sample. Negative results may reflect the absence of drug or drug present below the assay's limit of quantitation. The detection of drugs in urine is dependent on several factors including the amount of drug ingested, time since exposure, individual metabolism, kidney and liver function, urine concentration, and the assay's limit of detection. Drug concentrations in urine cannot determine the dose, route of administration, or exact time of exposure.	Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)		Quetiapine: 25-5,000 ng/mL Quetiapine Carboxylic Acid: 25-5,000 ng/mL	Quetiapine: 25-5,000 ng/mL Quetiapine Carboxylic Acid: 25-5,000 ng/mL
Sirolimus (Rapamycin) Level, Random	Bone Marrow Transplant: 3-12 Kidney/Pancreas Transplant: 0 to 3 months: 7-10; 3 to 12 months: 5-8; >12 months: 4-8		Chemiluminescent microparticle immunoassay	OSU Pharmacy	2.0-30.0 ng/mL	2.0-60.0 ng/mL
Sirolimus (Rapamycin) Level, Trough (Pre Drug Level)	Bone Marrow Transplant: 3-12 Kidney/Pancreas Transplant: 0 to 3 months: 7-10; 3 to 12 months: 5-8; >12 months: 4-8		Chemiluminescent microparticle immunoassay	OSU Pharmacy	2.0-30.0 ng/mL	2.0-60.0 ng/mL
Tacrolimus Level, Trough (Pre Drug Level)	Bone Marrow Transplant: 5-15 Kidney/Pancreas Transplant: 0 to 3 months: 8-10; 3 to 12 months: 6-8; >12 months: 4-6		Chemiluminescent microparticle immunoassay	OSU Pharmacy	2.0-30.0 ng/mL	2.0-60.0 ng/mL
Tacrolimus, Random	Bone Marrow Transplant: 5-15 Kidney/Pancreas Transplant: 0 to 3 months: 8-10; 3 to 12 months: 6-8; >12 months: 4-6		Chemiluminescent microparticle immunoassay	OSU Pharmacy	2.0-30.0 ng/mL	2.0-60.0 ng/mL
Toxicology, Umbilical Cord Segment	None Detected Cutoff concentrations: Amphetamine: 0.2 ng/g Methamphetamine: 0.5 ng/g 2-Hydroxyethylflurazepam: 1.0 ng/g 7-Aminoclonazepam: 0.2 ng/g 7-Aminoflunitrazepam: 0.2 ng/g alpha-Hydroxyalprazolam: 1.0 ng/g alpha-Hydroxymidazolam: 0.2 ng/g Alprazolam: 0.1 ng/g Clonazepam: 10 ng/g Diazepam: 0.2 ng/g Flurazepam: 0.1 ng/g Lorazepam: 50 ng/g Midazolam: 0.2 ng/g Nordiazepam: 0.5 ng/g Oxazepam: 2.5 ng/g Temazepam: 0.5 ng/g Buprenorphine: 0.5 ng/g Norbuprenorphine: 0.5 ng/g Cocaine: 0.2 ng/g Benzoylecgonine: 0.5 ng/g Fentanyl: 0.5 ng/g Norfentanyl: 0.5 ng/g Gabapentin: 10 na/e	Drugs and/or metabolites reported "Positive" were detected above the cutoff and indicate exposure to that drug/parent drug during gestation up to birth.	Liquid Chromatography Tandem Mass Spectrometry (LC-			None Detected, Positive

	6-Monoacetylmorphine: 0.1 ng/g Ketamine: 0.1 ng/g Norketamine: 0.2 ng/g Methadone: 0.1 ng/g EDDP Methadone: 0.2 ng/g Methylphenidate: 0.1 ng/g Ritalinic Acid: 50 ng/g Codeine: 0.5 ng/g Morphine: 0.5 ng/g Hydrocodone: 0.2 ng/g Hydromorphone: 0.1 ng/g Naloxone: 0.2 ng/g Meperidine: 0.1 ng/g Normeperidine: 0.1 ng/g Nalbuphine: 0.5 ng/g Noroxycodone: 0.2 ng/g Oxycodone: 0.2 ng/g Oxymorphone: 0.5 ng/g Phencyclidine: 0.2 ng/g Pregabalin: 50 ng/g Tramadol: 0.1 ng/g Quetiapine: 0.2 ng/g Mitragynine: 0.5 ng/g Xylazine: 0.2 ng/g Zolpidem: 0.1 ng/g Zopiclone: 0.2 ng/g	Drug and/or metabolites reported "None Detected" were not detected above the cutoff. These results do NOT preclude the possibility that the mother used this drug during pregnancy.	MS/MS)			
Tramadol, Urine	None Detected Cutoff concentrations by liquid chromatography-tandem mass spectrometry: <25 ng/mL	Numeric results (positive) indicate the measured concentration of drug in the urine sample. Negative results may reflect the absence of drug or drug present below the assay's limit of quantitation. The detection of drugs in urine is dependent on several factors including the amount of drug ingested, time since exposure, individual metabolism, kidney and liver function, urine concentration, and the assay's limit of detection. Drug concentrations in urine cannot determine the dose, route of administration, or exact time of exposure.	Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)		25-5,000 ng/mL	25-5,000 ng/mL
Urine Drug Screen 10	None Detected Cutoff concentrations by immunoassay detection: Amphetamine/Methamphetamine: 500 ng/mL Barbiturates: 200 ng/mL	Presumptive positive results indicate the presence of a compound within the specified class of drugs or a structurally related compound in the urine sample. Negative results may reflect the absence of drug or drug present below the assay's limit of detection. The detection of drugs in urine is dependent on several factors such as the amount of drug ingested, time since exposure, individual metabolism, kidney and liver function, urine concentration, and the assay's limit of detection.	Beckman Coulter DxC700AU: Emit® II Plus Amphetamines Assay, Barbiturates Assay, Benzodiazepine Assay, Buprenorphine Assay, Cannabinoids Assay, Cocaine Metabolite Assay, Methadone Assay, and Opiates Assay. ARK™ Fentanyl II Assay. DRI® Oxycodone Assay.			Negative, Positive, Presumptive Positive. Confirmation to follow.
Urine Drug Screen 10 with Confirmation	None Detected Cutoff concentrations by immunoassay detection: Amphetamine/Methamphetamine: 500 ng/mL Barbiturates: 200 ng/mL Benzodiazepines: 200 ng/mL Buprenorphine: 5 ng/mL Cannabinoids: 50 ng/mL	Presumptive positive results indicate the presence of a compound within the specified class of drugs or a structurally related compound in the urine sample. Negative results may reflect the absence of drug or drug present below the assay's limit of quantitative. The detection of drugs in urine is dependent on several factors including the amount of drug ingested, time since exposure, individual metabolism, kidney and liver function, urine concentration, and the assay's limit of detection.	**Screen:** Beckman Coulter DxC700AU: Emit® II Plus Amphetamines Assay, Barbiturates Assay, Benzodiazepine Assay, Buprenorphine Assay, Cannabinoids Assay, Cocaine Metabolite Assay, Methadone Assay, and Opiates Assay. ARK™ Fentanyl II Assay. DRI® Oxycodone Assay. **Confirmation:** Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)			See individual reflex tests
Valproic Acid, Free	Therapeutic Range: 5-55 mcg/mL		Chemiluminescent microparticle immunoassay	OSU Pharmacy	2-150 mcg/mL	2-150 mcg/mL
Valproic Acid, Total	Therapeutic Range: 50-120 mcg/mL		Chemiluminescent microparticle immunoassay		2-150 mcg/mL	2-1500 mcg/mL
Volatile Alcohol Panel, Blood	**METHANOL** <10 mg/dL **ETHYL ALCOHOL** <10 mg/dL		Gas Chromatography (GC) Flame Ionization Detection (FID)		METHANOL: 10-400 mg/dL ETHYL ALCOHOL: 10-400 mg/dL ACETONE: 10-400 mg/dL ISOPROPANOL: 10-400 mg/dL	METHANOL: 10-400 mg/dL ETHYL ALCOHOL: 10-400 mg/dL ACETONE: 10-400 mg/dL ISOPROPANOL: 10-400 mg/dL
Zaleplon, Zolpidem, Zopiclone, Urine	None Detected Cutoff concentrations by liquid chromatography-tandem mass spectrometry: Zaleplon: <25 ng/mL Zolpidem: <25 ng/mL	Numeric results (positive) indicate the measured concentration of drug in the urine sample. Negative results may reflect the absence of drug or drug present below the assay's limit of quantitation. The detection of drugs in urine is dependent on several factors including the amount of drug ingested, time since exposure, individual metabolism, kidney and liver function, urine concentration, and the assay's limit of detection. Drug concentrations in urine cannot determine the dose, route of administration, or exact time of exposure.	Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)		Zaleplon: 25-5,000 ng/mL Zolpidem: 25-5,000 ng/mL Zolpidem, Phenyl-4-Carboxyl Acid: 25-5,000 ng/mL Zolpiclone: 5-2,000 ng/mL	Zaleplon: 25-5,000 ng/mL Zolpidem: 25-5,000 ng/mL Zolpidem, Phenyl-4-Carboxyl Acid: 25-5,000 ng/mL Zolpiclone: 5-2,000 ng/mL
Adrenal Vein Sampling Pre Stimulation	**CORTISOL LEFT AV1** 3.09-22.40 mcg/dL **CORTISOL RIGHT AV1** 3.09-22.40 mcg/dL **CORTISOL IVC1** 3.09-22.40 mcg/dL **CORTISOL LEFT AV2** 3.09-22.40 mcg/dL **CORTISOL RIGHT AV2** 3.09-22.40 mcg/dL **CORTISOL IVC2** 3.09-22.40 mcg/dL **CORTISOL LEFT AV3** 3.09-22.40 mcg/dL **CORTISOL RIGHT AV3** 3.09-22.40 mcg/dL **CORTISOL IVC3** 3.09-22.40 mcg/dL **ALDOSTERONE LEFT AV1** <23.20 ng/dL **ALDOSTERONE RIGHT AV1** <23.20 ng/dL **ALDOSTERONE IVC1** <23.20 ng/dL **ALDOSTERONE LEFT AV2** <23.20 ng/dL **ALDOSTERONE RIGHT AV2** <23.20 ng/dL **ALDOSTERONE IVC2** <23.20 ng/dL **ALDOSTERONE LEFT AV3** <23.20 ng/dL **ALDOSTERONE RIGHT AV3** <23.20 ng/dL **ALDOSTERONE IVC3** <23.20 ng/dL	**Aldosterone Reference Range** Plasma Upright: <35.30 ng/dL Plasma Supine: <23.60 ng/dL Serum Upright: <39.20 ng/dL Serum Supine: <23.20 ng/dL	Chemiluminescent immunoassay	See individual analytes	See individual analytes	See individual analytes
AVS Additional Pre-Panel	**CORTISOL LEFT AV4** 3.09-22.40 mcg/dL **CORTISOL RIGHT AV4** 3.09-22.40 mcg/dL **CORTISOL IVC4** 3.09-22.40 mcg/dL **CORTISOL LEFT AV5** 3.09-22.40 mcg/dL **CORTISOL RIGHT AV5** 3.09-22.40 mcg/dL **CORTISOL IVC5** 3.09-22.40 mcg/dL **CORTISOL LEFT AV6** 3.09-22.40 mcg/dL **CORTISOL RIGHT AV6** 3.09-22.40 mcg/dL **CORTISOL IVC6** 3.09-22.40 mcg/dL **ALDOSTERONE LEFT AV4** <23.20 ng/dL **ALDOSTERONE RIGHT AV4** <23.20 ng/dL	**Aldosterone Reference Range** Plasma Upright: <35.30 ng/dL Plasma Supine: <23.60 ng/dL Serum Upright: <39.20 ng/dL Serum Supine: <23.20 ng/dL	Chemiluminescent immunoassay	See individual analytes	See individual analytes	See individual analytes

Adrenal Vein Sampling Post Stimulation	**ALDOSTERONE 5 MIN LEFT AV** <23.20 ng/dL **ALDOSTERONE 5 MIN RIGHT AV** <23.20 ng/dL **ALDOSTERONE 5 MIN IVC AV** <23.20 ng/dL **ALDOSTERONE 10 MIN LEFT AV** <23.20 ng/dL **ALDOSTERONE 10 MIN RIGHT AV** <23.20 ng/dL **ALDOSTERONE 10 MIN IVC AV** <23.20 ng/dL **ALDOSTERONE 15 MIN LEFT AV** <23.20 ng/dL **ALDOSTERONE 15 MIN RIGHT AV** <23.20 ng/dL **ALDOSTERONE 15 MIN IVC AV** <23.20 ng/dL **CORTISOL 5 MIN LEFT AV** 3.09-22.40 mcg/dL **CORTISOL 5 MIN RIGHT AV** 3.09-22.40 mcg/dL **CORTISOL 5 MIN IVC AV** 3.09-22.40 mcg/dL **CORTISOL 10 MIN LEFT AV** 3.09-22.40 mcg/dL **CORTISOL 10 MIN RIGHT AV** 3.09-22.40 mcg/dL **CORTISOL 10 MIN IVC AV** 3.09-22.40 mcg/dL **CORTISOL 15 MIN LEFT AV** 3.09-22.40 mcg/dL **CORTISOL 15 MIN RIGHT AV** 3.09-22.40 mcg/dL **CORTISOL 15 MIN IVC AV** 3.09-22.40 mcg/dL			Chemiluminescent immunoassay	See individual analytes	See individual analytes	See individual analytes
AFP Tumor Marker	<8.1 ng/mL			Two-site sandwich immunoassay chemiluminescent	Siemens AFP Package Insert 10995310 EN Rev. 03, 2020-02	2.2-1,000.0 ng/mL	2.2-1,000,000.0 ng/mL
Aldosterone			**Reference Range:** Plasma Upright: <35.30 ng/dL Plasma Supine: <23.60 ng/dL Serum Upright: <39.20 ng/dL Serum Supine: <23.20 ng/dL	Chemiluminescent immunoassay	Package Insert	4.00-100.00 ng/dL	4.00-100,000.00 ng/dL
ANA Multiplex Screen			Negative	Multiplex flow immunoassay	Package Insert Textbook		Negative, Positive
ANA Multiplex Scrn with Reflex			Negative	Multiplex flow immunoassay	Package Insert Textbook		Negative, Positive
ANA Screen IFA			Negative	Indirect immunofluorescence antibody	INOVA IFU 2018 Revision 7		SCREEN: Negative, Positive QUANTITATIVE: 1:80, 1:160, 1:320, 1:640, 1:1280, ≥1:2560
ANCA Ind Scrn (ANCA, PR3AB, MPO)			Negative	**ANCA: Indirect fluorescent antibody** **MPO & PR3: Multiplex flow immunoassay**	INOVA IFU 2019 Revision 3 (ANCA). Instructions for use manual (MPO & PR3)		See individual analytes
Anti Microsomal Antibody	<60.0 IU/mL			Chemiluminescent immunoassay	Siemens Anti-Thyroid Peroxidase Package Insert 10995280 EN Rev. 02, 2019-07	28.0-1,300.0 IU/mL	28.0-130,000.0 IU/mL
Anti Mitochondrial Antibody			Negative	Indirect immunofluorescence antibody	INOVA IFU 2019 Revision 21		SCREEN: Negative, Positive, Indeterminate TITER: 1:20, 1:40, 1:80, 1:160, >1:320
Anti Mullerian Hormone	18-19 years: 0.530-10.580 ng/mL 20-24 years: 1.530-16.460 ng/mL 25-29 years: 0.910-13.520 ng/mL 30-34 years: 0.480-11.000 ng/mL 35-39 years: ≤10.160 ng/mL 40-44 years: ≤7.360 ng/mL 45-49 years: ≤3.300 ng/mL 50+ years: ≤0.900 ng/mL	18+ years: ≤18.000 ng/mL		One-step sandwich immunoassay	Siemens Insulin Package Insert 10998438_EN Rev. 01, 2023-06	0.043-24.000 ng/mL	0.043-24.000 ng/mL
Anti Neutrophil Cytoplasmic Antibody			Negative	Indirect immunofluorescence antibody	INOVA IFU 2019 Revision 3		SCREEN: Negative, Positive, Atypical fluorescence present TITER: 1:20, 1:40, 1:80, 1:160, 1:320, 1:640, >1:1280
Anti Parietal Antibody			Negative	Indirect immunofluorescence antibody	INOVA IFU 2019 Revision 21		SCREEN: Negative, Positive, Indeterminate TITER: 1:20, 1:40, 1:80, 1:160, ≥1:320
Anti Smooth Muscle Antibody			Negative	Indirect immunofluorescence antibody	INOVA IFU 2019 Revision 21		SCREEN: Negative, Positive, Indeterminate TITER: 1:20, 1:40, 1:80, 1:160, ≥1:320
Anti-Proteinase 3 Ab			Negative	Multiplex flow immunoassay	IFU		Negative, Positive
Anti-Scleroderma Ab (SCL70)			Negative	Multiplex flow immunoassay	Package Insert Textbook		Negative, Positive
Beta 2 Microglobulin Serum	0.80-2.34 mg/L			Turbidimetry	Package insert (Insert Code: IN5043.OPT.A, Version: 09th August 2018)	0.30-20.00 mg/L	0.30-40.00 mg/L
Calcitonin	≤9.53 pg/mL	≤13.38 pg/mL		Two-site sandwich immunoassay chemiluminescent	Siemens Calcitonin Package Insert 10981130 IH1 Rev. 01, 2019-04	5.00-1,800.00 pg/mL	5.00-180,000.00 pg/mL
Centromere B Antibody			Negative	Multiplex flow immunoassay	Package Insert Textbook		Negative, Positive
Chromatin Antibody			Negative	Multiplex flow immunoassay	Package Insert Textbook		Negative, Positive
Chronic Hepatitis Panel (Dialysis, ESRD, AKI)			**HBSAG:** Negative **HBSAB:** Negative **HBCCM:** Negative **HCAB:** Neative	Chemiluminescent immunoassay	See individual analytes	See individual analytes	See individual analytes
CMV IgG Ab			Negative	Chemiluminescent immunoassay	Package Insert		Negative, Positive, Indeterminate
CMV IgM Ab			Negative	Chemiluminescent immunoassay	Package Insert		Negative, Positive, Indeterminate
CMVG, CMVM, EBV, HSVG12, HSVM			**CMVG:** Negative **CMVM:** Negative **EBV:** Negative **HSVG12:** Negative **HSVM:** Negative	**CMVM & CMVG:** Chemiluminescent immunoassay **EBV & HSVG12:** Multiplex flow immunoassay **HSVM:** ELISA manual method	See individual analytes	See individual analytes	See individual analytes
C-Peptide	0.81-3.85 ng/mL			Two-site sandwich immunoassay chemiluminescent	Siemens C-Peptide Package Insert 10997742_EN Rev. 03, 2021-06	0.05-25.00 ng/mL	0.05-5,000.00 ng/mL
C-Peptide Tolerance (Part of the Insulin Glucose Tolerance Battery): -5 Minutes	0.81-3.85 ng/mL			Two-site sandwich immunoassay chemiluminescent	Siemens C-Peptide Package Insert 10997742_EN Rev. 03, 2021-06	0.05-25.00 ng/mL	0.05-5,000.00 ng/mL
C-Peptide Tolerance (Part of the Insulin Glucose Tolerance Battery): 0 Minute	0.81-3.85 ng/mL			Two-site sandwich immunoassay chemiluminescent	Siemens C-Peptide Package Insert 10997742_EN Rev. 03, 2021-06	0.05-25.00 ng/mL	0.05-5,000.00 ng/mL
C-Peptide Tolerance (Part of the Insulin Glucose Tolerance Battery): 2 Minutes	0.81-3.85 ng/mL			Two-site sandwich immunoassay chemiluminescent	Siemens C-Peptide Package Insert 10997742_EN Rev. 03, 2021-06	0.05-25.00 ng/mL	0.05-5,000.00 ng/mL
C-Peptide Tolerance (Part of the Insulin Glucose Tolerance Battery): 5 Minutes	0.81-3.85 ng/mL			Two-site sandwich immunoassay chemiluminescent	Siemens C-Peptide Package Insert 10997742_EN Rev. 03, 2021-06	0.05-25.00 ng/mL	0.05-5,000.00 ng/mL
C-Peptide Tolerance (Part of the Insulin Glucose Tolerance Battery): 10 Minutes	0.81-3.85 ng/mL			Two-site sandwich immunoassay chemiluminescent	Siemens C-Peptide Package Insert 10997742_EN Rev. 03, 2021-06	0.05-25.00 ng/mL	0.05-5,000.00 ng/mL
C-Peptide Tolerance (Part of the Insulin Glucose Tolerance Battery): 30 Minutes	0.81-3.85 ng/mL			Two-site sandwich immunoassay chemiluminescent	Siemens C-Peptide Package Insert 10997742_EN Rev. 03, 2021-06	0.05-25.00 ng/mL	0.05-5,000.00 ng/mL
Cryptococcal Antigen			Negative	Lateral flow assay	Package Insert		SCREEN: Negative, Positive TITER: 1:2, 1:5, 1:10, 1:20, 1:40, 1:80, 1:160, 1:320, 1:640, 1:1280, ≥1:2560
Cryptococcus, Antigen CSF			Negative	Lateral flow assay	Package Insert		SCREEN: Negative, Positive TITER: 1:2, 1:5, 1:10, 1:20, 1:40, 1:80, 1:160, 1:320, 1:640, 1:1280, ≥1:2560
Cyclic Citrullinated Peptide Ab	<5.00 U/mL			Chemiluminescent microparticle immunoassay	Siemens ACCP Package Insert Rev. 06, 2022-05	0.54-200.00 U/mL	0.54-20,000.00 U/mL
DHEA-Sulfate	25.90-460.20 ng/dL	34.50-568.90 ug/dL		Chemiluminescent immunoassay	Siemens DHEAS Package Insert 11200382 EN	1.50-1,500.00 ug/dL	1.50-3,000.00 ug/dL
dsDNA Antibody			Negative	Multiplex flow immunoassay	Package Insert Textbook	QUANTITATIVE: 1-300 IU/mL	QUALITATIVE: Negative, Positive, Indeterminate QUANTITATIVE: 1-30,000 IU/mL
EBV VCA IgG Ab			Negative	Multiplex flow immunoassay	Package Insert Textbook		Negative, Positive, Indeterminate
EBV VCA IgG and IgM			**EBVG:** Negative **EBVM:** Negative	Multiplex flow immunoassay	See individual analytes	See individual analytes	See individual analytes
EBV VCA IgM Ab			Negative	Multiplex flow immunoassay	Package Insert Textbook		Negative, Positive, Indeterminate
ENA Battery (SSA, SSB, SM, RNP)			**RNP:** Negative **SMT:** Negative **SSAT:** Negative **SSBT:** Negative	Multiplex flow immunoassay	See individual analytes	See individual analytes	See individual analytes
Erythropoietin	2.6-18.5 mIU/mL			One-step sandwich immunoassay	Adapted from Mayo Clinic Laboratory	1.0-600.0 mIU/mL	1.0-6,000.0 mIU/mL
Free Hemoglobin, Plasma	≤5.0 mg/dL			Photometric	HemoCue Omnirange Manual	30.0-2,100.0 mg/dL	≥50.0 mg/dL
G6PD, Qualitative			Enzyme Activity Present	Visual Fluorescence	Package Insert		Enzyme Activity Absent, Enzyme Activity Present, Enzyme Activity Indeterminate
Anti-Glomerular Basement Mem Ab			Negative	Multiplex flow immunoassay	Bio-Rad IFU Viaculitis Revision:665-0516E		Negative, Positive
Growth Hormone	≤6.88 ng/mL	≤1.23 ng/mL		Chemiluminescent immunoassay	Package Insert	0.05-80.00 ng/mL	0.05-1,600.00 ng/mL
Hemoglobin A1C	4.3-5.8 %			High-Performance Liquid Chromatography (HPLC)	Textbook	3.5-15.0 %	3.5-15.0 %
Hemoglobin, Fetal	<1.0 %			High-Performance Liquid Chromatography (HPLC)	Package Insert Textbook	1.0-40.0 %	1.0-40.0 %

Hemoglobinopathy Eval	**HEPB:** **HGBA** ≥95.0% **HGBA2** 2.1-3.3 % **HGBF** <1.0 % **HGBC** ≤0.0% **HGBS** ≤0.0% **HGB OTHER** <0.0% **GCBCH:** **RBC** 0-14 days: 4.12-5.74 M/uL 15-30 days: 3.32-4.80 M/uL 31-60 days: 2.93-3.87 M/uL 61-179 days: 3.45-4.75 M/uL 180 days-2 years: 3.97-5.01 M/uL 2-5 years: 3.84-4.92 M/uL 6-11 years: 3.90-4.98 M/uL 12-17 years: 3.93-4.90 M/uL 18+ years: 3.91-5.04 M/uL **HGB** 0-7 days: 13.4-20.0 g/dL 8-14 days: 13.4-20.0 g/dL 15-30 days: 10.8-14.6 g/dL 31-60 days: 9.2-11.4 g/dL 61-179 days: 9.9-12.4 g/dL 180 days-2 years: 10.2-12.7 g/dL 2-5 years: 10.2-12.7 g/dL 6-11 years: 10.6-13.2 g/dL 12-17 years: 10.8-13.3 g/dL 18+ years: 11.4-15.2 g/dL **MCHC** 0-14 days: 33.4-35.4 g/dL 15-30 days: 33.2-35.0 g/dL 31-60 days: 32.5-34.9 g/dL 61-179 days: 32.1-34.4 g/dL 180 days-2 years: 31.9-34.2 g/dL 2-5 years: 31.8-34.6 g/dL 6-11 years: 31.8-34.6 g/dL 12-17 years: 31.5-34.2 g/dL 18+ years: 31.4-35.9 g/dL **MCV** 0-14 days: 92.7-106.4 fL 15-30 days: 90.1-103.0 fL 31-60 days: 83.4-96.4 fL 61-179 days: 74.8-88.5 fL 180 days-2 years: 71.3-82.6 fL 2-5 years: 72.3-85.0 fL 6-11 years: 75.9-87.6 fL 12-17 years: 76.9-90.6 fL 18+ years: 79.6-97.7 fL **RDW** 0-14 days: 14.6-17.3 % 15-30 days: 14.4-16.2 % 31-60 days: 13.6-15.8 % 61-179 days: 12.2-14.3 % 180 days-2 years: 12.7-15.1 % 2-5 years: 12.4-14.9 % 6-11 years: 12.2-14.4 % 12-17 years: 12.3-14.6 % 18+ years: 10.8-14.9 %	**HEPB:** **HGBA** ≥95.0% **HGBA2** 2.1-3.3 % **HGBF** <1.0 % **HGBC** ≤0.0% **HGBS** ≤0.0% **HGB OTHER** <0.0% **GCBCH:** **RBC** 0-14 days: 4.10-5.55 M/uL 15-30 days: 3.16-4.63 M/uL 31-60 days: 3.02-4.22 M/uL 61-179 days: 3.43-4.80 M/uL 180 days-2 years: 4.03-5.07 M/uL 2-5 years: 3.89-4.97 M/uL 6-11 years: 3.96-5.01 M/uL 12-17 years: 4.05-5.29 M/uL 18+ years: 4.38-5.83 M/uL **HGB** 0-7 days: 13.9-19.1 g/dL 8-14 days: 13.9-19.1 g/dL 15-30 days: 10.0-15.3 g/dL 31-60 days: 8.9-12.7 g/dL 61-179 days: 9.6-12.4 g/dL 180 days-2 years: 10.1-12.5 g/dL 2-5 years: 10.2-12.7 g/dL 6-11 years: 10.7-13.4 g/dL 12-17 years: 11.0-14.5 g/dL 18+ years: 13.4-16.8 g/dL **MCHC** 0-14 days: 33.0-35.7 g/dL 15-30 days: 32.7-35.1 g/dL 31-60 days: 32.1-34.8 g/dL 61-179 days: 31.9-34.4 g/dL 180 days-2 years: 31.6-34.4 g/dL 2-5 years: 32.0-34.7 g/dL 6-11 years: 32.2-34.9 g/dL 12-17 years: 31.8-34.8 g/dL 18+ years: 31.9-36.5 g/dL **MCV** 0-14 days: 91.3-103.1 fL 15-30 days: 89.4-99.7 fL 31-60 days: 84.3-94.2 fL 61-179 days: 74.1-87.5 fL 180 days-2 years: 69.5-81.7 fL 2-5 years: 71.3-84.0 fL 6-11 years: 74.4-86.1 fL 12-17 years: 76.7-89.2 fL 18+ years: 79.0-94.5 fL **RDW** 0-14 days: 14.8-17.0 % 15-30 days: 14.3-16.8 % 31-60 days: 13.8-16.1 % 61-179 days: 12.4-15.3 % 180 days-2 years: 12.9-15.6 % 2-5 years: 12.5-14.9 % 6-11 years: 12.3-14.1 % 12-17 years: 12.4-14.5 % 18+ years: 10.9-14.3 %	HEPB High-Performance Liquid Chromatography (HPLC) GCBCH The Sysmex XN performs hematology analysis according to the hydrodynamic focusing (DC detection), flow cytometry method (semiconductor laser), and sodium lauryl sulfate (SLS)-hemoglobin method	Package Insert Textbook	HGBA2: 1.0-7.0 % HGBF: 1.0-40.0 % RBC: See individual analyte HGB: See individual analyte MCHC: See individual analyte MCV: See individual analyte RDW: See individual analyte	HGBA2: 1.0-7.0 % HGBF: 1.0-40.0 % RBC: See individual analyte HGB: See individual analyte MCHC: See individual analyte MCV: See individual analyte RDW: See individual analyte
Hepatitis A Ab, Total (IgG + IgM)			Negative	Competitive direct chemiluminescent immunoassay	Package Insert		Negative, Positive, Indeterminate
Hepatitis A IgM Ab			Negative	Two-step IgM capture immunoassay	Package Insert		Negative, Positive, Indeterminate
Hepatitis B Core Ab, Total (IgG + IgM)			Negative	Two-w-ash antigen sandwich immunoassay	Package Insert		Negative, Positive, Indeterminate
Hepatitis B Core IgM Ab			Negative	Two-step IgM capture immunoassay	Package Insert		Negative, Positive, Indeterminate
Hepatitis B Surface Antibody			Negative	Sandwich direct chemiluminescent immunoassay	Package Insert		Negative, Positive
Hepatitis B Surface Antigen			Negative	Sandwich direct chemiluminescent immunoassay	Package Insert		Negative, Positive, Initially reactive, to be confirmed by neutralization
Hepatitis Battery, Acute			**HBSAG:** Negative **HBCGM:** Negative **HBCBM:** Negative **HAABM:** Negative **HCAB:** Negative	Chemiluminescent immunoassay	See individual analytes	See individual analytes	See individual analytes
Hepatitis Battery, Chronic			**HBSAG:** Negative **HBSAB:** Negative **HBCGM:** Negative **HCAB:** Negative	Chemiluminescent immunoassay	See individual analytes	See individual analytes	See individual analytes
Hepatitis Be Antibody			Non Reactive	Chemiluminescent immunoassay	Package Insert		Nonreactive, Reactive
Hepatitis Be Antigen			Negative	Two-step sandwich immunoassay	Package Insert		Negative, Positive
Hepatitis C Antibody			Negative	Indirect sandwich immunoassay	Package Insert		Negative, Positive, Indeterminate
Hepatitis Infectious			**HBSAG:** Negative **HBCGM:** Negative **HBSAB:** Negative	Chemiluminescent immunoassay	See individual analytes	See individual analytes	See individual analytes
Histoplasma Antigen, Urine			Not Detected	Enzyme Immunoassay	Package Insert	0.20-25.00	Not Detected, Detected
HIV-1/HIV-2 Differentiation			**HIV-1:** Non Reactive **HIV-2:** Non Reactive	Immunochromatographic assay	Package Insert		HIV-1: Non Reactive, Reactive, Indeterminate HIV-2: Non Reactive, Reactive, Indeterminate
HSV 1 and 2 IgG Antibody			**HSVG1:** Negative **HSVG2:** Nonative	Multiplex flow immunoassay	Package Insert Textbook		HSVG1: Negative, Positive, Indeterminate HSVG2: Nonative, Positive, Indeterminate
HSV 2 IgG Antibody			Negative	Multiplex flow immunoassay	Package Insert Textbook		Negative, Positive, Indeterminate
HSV IgM Antibody			Negative	ELISA manual method	Textbooks, HSV-1&2 IgG procedure, Package Insert		Negative, Positive, Equivocal
IgG4 (Immunoglobulin G Subclass 4)	0-4 months: ≤19.8 mg/dL			Turbidimetry	Adopted from Mayo Clinic Laboratory Reference Range	5.4-270.0 mg/dL	0.4-4,440.0 mg/dL
Immune Status Hepatitis Battery			**HBCGM:** Negative **HBSAB:** Negative **HCAB:** Nonitive	Chemiluminescent immunoassay	See individual analytes	See individual analytes	See individual analytes
Immunofixation, Serum	**MPRO1** ≤0.0 mg/dL **MPRO2** ≤0.0 mg/dL **MPRO3** ≤0.0 mg/dL **MPRO4** ≤0.0 mg/dL			Capillary electrophoresis	Package Insert		MPRO1: ≤0.0 mg/dL MPRO2: ≤0.0 mg/dL MPRO3: ≤0.0 mg/dL MPRO4: ≤0.0 mg/dL
Immunoglobulin Free Chains	**KFLC** 3.9-26.0 mg/L **LFLC** 6.4-22.1 mg/L **RATIO** 0.51-1.72			Turbidimetry	2017 OSU Study	KFLC: 2.9-127.0 mg/L LFLC: 5.2-139.0 mg/L	KFLC: 0.6-63,590.0 mg/L LFLC: 1.4-139,000.0 mg/L
Immunoglobulin IgE	≤165.3 IU/mL			Two-site sandwich direct chemiluminescent immunoassay	Reference Range Study 11.3.2016	2.5-3,000.0 IU/mL	2.5-3,000.0 IU/mL
Insulin	3.0-25.0 uIU/mL			Two-site sandwich chemiluminescent immunoassay	Siemens Insulin Package Insert 10997752 EN Rev. 05, 2021-06	0.5-300.0 uIU/mL	0.5-1,500.0 uIU/mL
Insulin Glucose Tolerance Mins 5 Min	3.0-25.0 uIU/mL			Two-site sandwich chemiluminescent immunoassay	Siemens Insulin Package Insert 10997752 EN Rev. 05, 2021-06	0.5-300.0 uIU/mL	0.5-1,500.0 uIU/mL
Insulin Glucose Tolerance 0 Minute	3.0-25.0 uIU/mL			Two-site sandwich chemiluminescent immunoassay	Siemens Insulin Package Insert 10997752 EN Rev. 05, 2021-06	0.5-300.0 uIU/mL	0.5-1,500.0 uIU/mL
Insulin Glucose Tolerance 2 Minute	3.0-25.0 uIU/mL			Two-site sandwich chemiluminescent immunoassay	Siemens Insulin Package Insert 10997752 EN Rev. 05, 2021-06	0.5-300.0 uIU/mL	0.5-1,500.0 uIU/mL
Insulin Glucose Tolerance 5 Minute	3.0-25.0 uIU/mL			Two-site sandwich chemiluminescent immunoassay	Siemens Insulin Package Insert 10997752 EN Rev. 05, 2021-06	0.5-300.0 uIU/mL	0.5-1,500.0 uIU/mL
Insulin Glucose Tolerance 10 Minute	3.0-25.0 uIU/mL			Two-site sandwich chemiluminescent immunoassay	Siemens Insulin Package Insert 10997752 EN Rev. 05, 2021-06	0.5-300.0 uIU/mL	0.5-1,500.0 uIU/mL
Insulin Glucose Tolerance 30 Minute	3.0-25.0 uIU/mL			Two-site sandwich chemiluminescent immunoassay	Siemens Insulin Package Insert 10997752 EN Rev. 05, 2021-06	0.5-300.0 uIU/mL	0.5-1,500.0 uIU/mL
Insulin Like Growth Factor 1	See Reference Ranges			Chemiluminescent immunoassay	Package Insert	10.0-1,000.0 ng/mL	10.0-1,000.0 ng/mL
Intact PTH (Intraoperative)	14.0-72.0 pg/mL			Two-site sandwich immunoassay	Atellica product insert tPTH REV 4, 2020/11	6.3-2,000.0 pg/mL	6.3-160,000.0 pg/mL
JO-1 Antibody			Negative	Multiplex flow immunoassay	Package Insert Textbook		Negative, Positive
Lyme Antibody			Negative	Chemiluminescent immunoassay	Package Insert		Negative, Positive
Legionella Urinary Ag			Negative	Enzyme Immunoassay (EIA)	Package Insert		Negative, Positive

M Tuberculosis By Quantiferon			Negative	Chemiluminescent immunoassay	Package Insert		MITIBERQUANT: Negative, Positive, Indeterminate MTB TB1-NIL: 0.00-10.00 IU/mL MTB TB2-NIL: 0.00-10.00 IU/mL MTB MITOGEN-NIL: 0.00-10.00 IU/mL MTB NIL: 0.00-10.00 IU/mL
Maternal Hepatitis B Surface Ag			Negative	Sandwich direct chemiluminescent immunoassay	Package Insert		Negative, Positive, Initially reactive, to be confirmed by neutralization
Maternal Rubella, IgG/Hep B Ag			**MHBSAG:** Negative **RUBAG:** Positive	Multiplex flow immunoassay	See individual analytes	See individual analytes	See individual analytes
Monoclonal Prot Imfx, Urine 24 Hr	**MPROU1** <50 mg/24hrs **MPROU2** <50 mg/24hrs **MPROU3** <50 mg/24hrs **PROT4** 40-225 mg/24 hrs			Electrophoresis	Package Insert		
Monoclonal Prot Immuno, Serum	**PROTEIN** 0-30 days: 4.2-6.2 g/dL 31-182 days: 4.4-6.6 g/dL 183-365 days: 5.6-7.9 g/dL 1-18 years: 5.7-8.0 g/dL 19+ years: 6.4-8.3 g/dL **ALBUMIN** 3.5-5.0 g/dL **ALPHA 1** 0.2-0.4 g/dL **ALPHA 2** 0.5-1.0 g/dL **BETA** 0.5-1.1 g/dL **GAMMA** 0.6-1.5 g/dL **IGA** 0-30 days: 0-10 mg/dL 31-182 days: ≤42 mg/dL 183-365 days: 6-68 mg/dL 1-3 years: 15-111 mg/dL 4-6 years: 33-166 mg/dL 7-9 years: 28-180 mg/dL 10-12 years: 55-193 mg/dL 13-15 years: 62-241 mg/dL 16-18 years: 69-262 mg/dL 19-59 years: 66-433 mg/dL 60+ years: 90-410 mg/dL **IGG** 0-30 days: 162-872 mg/dL 31-182 days: 311-664 mg/dL 183-365 days: 325-647 mg/dL 1-3 years: 451-1,202 mg/dL 4-6 years: 560-1,319 mg/dL 7-9 years: 485-1,473 mg/dL 10-12 years: 586-1,609 mg/dL 13-15 years: 749-1,640 mg/dL 16-18 years: 804-1,817 mg/dL 19-59 years: 600-1,714 mg/dL 60+ years: 600-1,560 mg/dL **IGM** 0-29 days: 1-57 mg/dL 30-182 days: <128 mg/dL 183-365 days: <131 mg/dL 1-3 years: 35-184 mg/dL 4-6 years: 42-184 mg/dL 7-9 years: 30-165 mg/dL 10-12 years: 42-211 mg/dL 13-15 years: 34-225 mg/dL 16-18 years: 45-224 mg/dL 19-59 years: 45-281 mg/dL 60+ years: 30-360 mg/dL **MPRO1** ≤0.0 mg/dL **MPRO2** ≤0.0 mg/dL **MPRO3** ≤0.0 mg/dL **MPRO4** ≤0.0 mg/dL	**PROTEIN** 0-30 days: 4.1-6.3 g/dL 31-182 days: 4.3-6.7 g/dL 183-365 days: 5.5-7.9 g/dL 1-18 years: 5.7-8.0 g/dL 19+ years: 6.4-8.3 g/dL **ALBUMIN** 3.5-5.0 g/dL **ALPHA 1** 0.2-0.4 g/dL **ALPHA 2** 0.5-1.0 g/dL **BETA** 0.5-1.1 g/dL **GAMMA** 0.6-1.5 g/dL **IGA** 0-30 days: ≤11 mg/dL 31-182 days: ≤40 mg/dL 183-365 days: 1-82 mg/dL 1-3 years: 9-137 mg/dL 4-6 years: 44-187 mg/dL 7-9 years: 58-204 mg/dL 10-12 years: 66-218 mg/dL 13-15 years: 29-251 mg/dL 16-18 years: 68-259 mg/dL 19-59 years: 66-433 mg/dL 60+ years: 90-410 mg/dL **IGG** 0-30 days: 197-833 mg/dL 31-182 days: 140-533 mg/dL 183-365 days: 130-823 mg/dL 1-3 years: 413-1,112 mg/dL 4-6 years: 468-1,328 mg/dL 7-9 years: 582-1,441 mg/dL 10-12 years: 685-1,620 mg/dL 13-15 years: 590-1,600 mg/dL 16-18 years: 522-1,703 mg/dL 19-59 years: 600-1,714 mg/dL 60+ years: 600-1,560 mg/dL **IGM** 0-29 days: 0-65 mg/dL 30-182 days: 6-84 mg/dL 183-365 days: 15-117 mg/dL 1-3 years: 30-146 mg/dL 4-6 years: 31-151 mg/dL 7-9 years: 21-140 mg/dL 10-12 years: 27-151 mg/dL 13-15 years: 26-184 mg/dL 16-18 years: 28-179 mg/dL 19-59 years: 45-281 mg/dL 60+ years: 30-360 mg/dL **MPRO1** ≤0.0 mg/dL **MPRO2** ≤0.0 mg/dL **MPRO3** ≤0.0 mg/dL **MPRO4** ≤0.0 mg/dL	Capillary electrophoresis	See individual analytes	See individual analytes	See individual analytes
Mumps, IgG Ab, Immune Status			Positive	Multiplex flow immunoassay	Package Insert Textbook		Negative, Positive, Indeterminate
Myeloperoxidase Antibodies			Negative	Multiplex flow immunoassay	IFU		Negative, Positive
Insulin: Post-Distal Splenic Artery	3.0-25.0 uIU/mL			Two-site sandwich chemiluminescent immunoassay	Siemens Insulin Package Insert 10997752 EN Rev. 05, 2021-06	0.5-300.0 uIU/mL	0.5-1,500.0 uIU/mL
Insulin: Post-Gastroduodenal Artery	3.0-25.0 uIU/mL			Two-site sandwich chemiluminescent immunoassay	Siemens Insulin Package Insert 10997752 EN Rev. 05, 2021-06	0.5-300.0 uIU/mL	0.5-1,500.0 uIU/mL
Insulin: Post-Miscellaneous Artery	3.0-25.0 uIU/mL			Two-site sandwich chemiluminescent immunoassay	Siemens Insulin Package Insert 10997752 EN Rev. 05, 2021-06	0.5-300.0 uIU/mL	0.5-1,500.0 uIU/mL
Insulin: Post-Proximal Splenic Artery	3.0-25.0 uIU/mL			Two-site sandwich chemiluminescent immunoassay	Siemens Insulin Package Insert 10997752 EN Rev. 05, 2021-06	0.5-300.0 uIU/mL	0.5-1,500.0 uIU/mL
Insulin: Post-Superior Mesenteric Artery	3.0-25.0 uIU/mL			Two-site sandwich chemiluminescent immunoassay	Siemens Insulin Package Insert 10997752 EN Rev. 05, 2021-06	0.5-300.0 uIU/mL	0.5-1,500.0 uIU/mL
Insulin: Pre-Distal Splenic Artery	3.0-25.0 uIU/mL			Two-site sandwich chemiluminescent immunoassay	Siemens Insulin Package Insert 10997752 EN Rev. 05, 2021-06	0.5-300.0 uIU/mL	0.5-1,500.0 uIU/mL
Insulin: Pre-Gastroduodenal Artery	3.0-25.0 uIU/mL			Two-site sandwich chemiluminescent immunoassay	Siemens Insulin Package Insert 10997752 EN Rev. 05, 2021-06	0.5-300.0 uIU/mL	0.5-1,500.0 uIU/mL
Insulin: Pre-Miscellaneous Artery	3.0-25.0 uIU/mL			Two-site sandwich chemiluminescent immunoassay	Siemens Insulin Package Insert 10997752 EN Rev. 05, 2021-06	0.5-300.0 uIU/mL	0.5-1,500.0 uIU/mL
Insulin: Pre-Proximal Splenic Artery	3.0-25.0 uIU/mL			Two-site sandwich chemiluminescent immunoassay	Siemens Insulin Package Insert 10997752 EN Rev. 05, 2021-06	0.5-300.0 uIU/mL	0.5-1,500.0 uIU/mL
Insulin: Pre-Superior Mesenteric Artery	3.0-25.0 uIU/mL			Two-site sandwich chemiluminescent immunoassay	Siemens Insulin Package Insert 10997752 EN Rev. 05, 2021-06	0.5-300.0 uIU/mL	0.5-1,500.0 uIU/mL
Protein Electrophoresis Serum, with Reflex	**PROTEIN** 0-30 days: 4.2-6.2 g/dL 31-182 days: 4.4-6.6 g/dL 183-365 days: 5.6-7.9 g/dL 1-18 years: 5.7-8.0 g/dL 19+ years: 6.4-8.3 g/dL **ALBUMIN** 3.5-5.0 g/dL **ALPHA 1** 0.2-0.4 g/dL **ALPHA 2** 0.5-1.0 g/dL **BETA** 0.5-1.1 g/dL **GAMMA** 0.6-1.5 g/dL	**PROTEIN** 0-30 days: 4.1-6.3 g/dL 31-182 days: 4.3-6.7 g/dL 183-365 days: 5.5-7.9 g/dL 1-18 years: 5.7-8.0 g/dL 19+ years: 6.4-8.3 g/dL **ALBUMIN** 3.5-5.0 g/dL **ALPHA 1** 0.2-0.4 g/dL **ALPHA 2** 0.5-1.0 g/dL **BETA** 0.5-1.1 g/dL **GAMMA** 0.6-1.5 g/dL	**PSE** Capillary electrophoresis **PROTEIN** Colorimetric with cupric ions in an alkaline solution	Package Insert	PROTEIN: 3.0-12.0 g/dL ALBUMIN: ≤0.0 g/dL ALPHA 1: ≤0.0 g/dL ALPHA 2: ≤0.0 g/dL BETA: ≤0.0 g/dL GAMMA: ≤0.0 g/dL	PROTEIN: 3.0-24.0 g/dL ALBUMIN: >0.0 g/dL ALPHA 1: >0.0 g/dL ALPHA 2: >0.0 g/dL BETA: >0.0 g/dL GAMMA: >0.0 g/dL
PTH Intact	14.0-72.0 pg/mL			Two-site sandwich immunoassay	Atellica product insert (PTH) REV 4, 2020/11	6.3-2,000.0 pg/mL	6.3-160,000.0 pg/mL
Renin	0-39 years: 4.2-52.2 pg/mL 40+ years: 3.6-81.6 pg/mL			Chemiluminescent immunoassay	Package Insert	2.1-300.0 pg/mL	2.1-3,000.0 pg/mL
Ribosomal P Antibody			Negative	Multiplex flow immunoassay	Package Insert Textbook		Negative, Positive
RNP Antibody			Negative	Multiplex flow immunoassay	Package Insert Textbook		Negative, Positive
RPR			Non Reactive	Macroscopic nontreponemal flocculation	Package Insert		SCREEN: Non Reactive, Reactive TITER: 1:1, 1:2, 1:4, 1:8, 1:16, 1:32, 1:64, 1:128, 1:256, 1:512, 1:1024, ≥1:2048
RPR with Titer			Non Reactive	Macroscopic nontreponemal flocculation	Package Insert		SCREEN: Non Reactive, Reactive TITER: 1:1, 1:2, 1:4, 1:8, 1:16, 1:32, 1:64, 1:128, 1:256, 1:512, 1:1024, ≥1:2048
Rubella IgG With Reflex To IgM			Positive	Multiplex flow immunoassay	Package Insert Textbook		Negative, Positive, Indeterminate
Rubella Immune Status IgG Antibody			Positive	Multiplex flow immunoassay	Package Insert Textbook		Negative, Positive, Indeterminate
Rubeola IgG Ab (Immune Status)			Positive	Multiplex flow immunoassay	BioPlex 2200 MMRV IgG Procedure Manch 2010		Negative, Positive, Indeterminate
Sex Hormone Binding Globulin	18.00-144.00 nmol/L	10.00-57.00 nmol/L		Sandwich immunoassay	Siemens IMMULITE 2000 SHBG (PIL2KSH-20_2018-03-15)	1.60-180.00 nmol/L	1.60-360.00 nmol/L
Sm Antibody			Negative	Multiplex flow immunoassay	Package Insert Textbook		Negative, Positive
Sm/RNP Antibody			Negative	Multiplex flow immunoassay	Package Insert Textbook		Negative, Positive
SS-A/RO Antibody			Negative	Multiplex flow immunoassay	Package Insert Textbook		Negative, Positive

SS-B/LA Antibody			Negative	Multiplex flow immunoassay	Package Insert Textbook		Negative, Positive
Syphilis Ab w/ Reflex RPR			Non Reactive	Direct sandwich assay	Package Insert		SYPHG: Non Reactive, Reactive, Equivocal RPR SCREEN: Non Reactive, Reactive RPR TITER: 1:1, 1:2, 1:4, 1:8, 1:16, 1:32, 1:64, 1:128, 1:256, 1:512, 1:1024, ≥1:2048
Toxoplasma IgG Antibody			Negative	Sandwich direct chemiluminescent immunoassay	Package Insert		Negative, Positive, Equivocal
Urine Immunofixation, Random				Electrophoresis	Package Insert		
Varicella IgG Ab (Immune Status)			Positive	Multiplex flow immunoassay	Package Insert Textbook		Negative, Positive, Indeterminate
Vitamin D (25-Hydroxy, Total)	30.0-100.0 ng/mL			Chemiluminescent immunoassay	Package Insert	4.0-150.0 ng/mL	4.0-150.0 ng/mL
Vitamin D, (1,25 Dihydroxy)	20.0-79.0 pg/mL			In vitro chemiluminescent immunoassay	Package Insert	5.0-180.0 pg/mL	5.0-540.0 pg/mL
ABO/Rh(D) Typing			Standard ABO/Rh(D) type will be reported: Routine ABO Types include: A, B, O, AB. Rh(D) types include: Negative and Positive. Any relevant discrepancies resulting in an undeterminant type will be noted.	Hemagglutination	Technical Manual. Current Edition. AABB		
ABO/RH - Not Valid for Transfusion			Standard ABO/Rh(D) type will be reported: Routine ABO Types include: A, B, O, AB. Rh(D) types include: Negative and Positive. Any relevant discrepancies resulting in an undeterminant type will be noted.	Hemagglutination	Technical Manual. Current Edition. AABB.		
Antibody Titer	Negative		The specificity of the maternal alloantibody will be stated. The titer result is the reciprocal of the highest dilution at which macroscopic agglutination (1+) is observed.	Hemagglutination	Alloimmunization Committee		
Antigen Testing			Each antigen typed will be listed by name, followed by "POS" indicating that the antigen is present, or by "NEG" indicating that the antigen is absent.	Hemagglutination	Technical Manual. Current Edition. AABB		
Baby Type and DAT (Direct Antiglobulin Test)	DAT Negative		ABO/Rh(D): Standard ABO/Rh(D) type will be reported. Routine ABO Types include: A, B, O, AB. Routine Rh(D) types include: Negative and Positive. DAT, Polyspecific: Negative: No IgG or complement detected on the surface of the red cell. Positive: IgG and/or complement detected on the surface of the red cell. Monospecific direct antiglobulin testing will be performed.	Hemagglutination	Technical Manual. Current Edition. AABB.		
Cold Agglutinin Titer	<32		Titers above 64 are considered elevated, but hemolytic anemia resulting from cold-reactive autoagglutinins rarely occurs unless the titer is 1000 or above. Titers below 1000 may be obtained when the autoantibody has a different specificity (eg, anti-i) or if the cold agglutinin is of the less-common low-titer, high-thermal-amplitude type. The test is not a direct measure of clinical significance and must be used in conjunction with other in vitro and in vivo parameters	Titration/Red Cell Agglutination			
Cord Blood Evaluation	**DAT** Negative		ABO/Rh(D): Standard ABO/Rh(D) type will be reported. Routine ABO Types include: A, B, O, AB. Routine Rh(D) types include: Negative and Positive. DAT, Polyspecific: Negative: No IgG or complement detected on the surface of the red cell. Positive: IgG and/or complement detected on the surface of the red cell. Monospecific direct antiglobulin testing will be performed.	Hemagglutination	Technical Manual. Current Edition. AABB		
Cordocentesis	**DAT** Negative		ABO/Rh(D): Standard ABO/Rh(D) type will be reported. Routine ABO Types include: A, B, O, AB. Routine Rh(D) types include: Negative and Positive. DAT, Polyspecific: Negative: No IgG or complement detected on the surface of the red cell. Positive: IgG and/or complement detected on the surface of the red cell. Monospecific direct antiglobulin testing will be performed	Hemagglutination	Technical Manual. Current Edition. AABB.		
Direct Antiglobulin Test (DAT)	Negative		Negative: No IgG or complement detected on the surface of the red cell. Positive: IgG and/or complement detected on the surface of the red cell. Monospecific direct antiglobulin testing will be performed.	Hemagglutination	Technical Manual. Current Edition. AABB.		
Rhoig Evaluation	**Fetal Screen** Negative		ABO/Rh(D): Standard ABO/Rh(D) type will be reported. Routine ABO Types include: A, B, O, AB. Routine Rh(D) types include: Negative and Positive. Fetal Screen: Negative: No Rh(D) cells detected. Positive: Rh(D) cells detected, testing will be sent to determin volume of fetal-to-maternal hemorrhage for the purpose of recommending an increased dose of Rh(D) immune globulin.	Hemagglutination	Technical Manual. Current Edition. AABB		
Transfusion Reaction Battery			See Transfusion Reaction Pathology Interpretation		Technical Manual. Current Edition. AABB		
Type and Screen	**ANTIBODY SCREEN** Negative		ABO/Rh(D): Standard ABO/Rh(D) type will be reported. Routine ABO Types include: A, B, O, AB. Routine Rh(D) types include: Negative and Positive. Antibody Screen: Negative: No antibody detected Positive: Antibody detected, an identification workup will be completed to establish the specificity and clinical significance	Hemagglutination	Technical Manual. Current Edition. AABB.		
Type and Screen - Not for Transfusion	**ANTIBODY SCREEN** Negative		ABO/Rh(D): Standard ABO/Rh(D) type will be reported. Routine ABO Types include: A, B, O, AB. Routine Rh(D) types include: Negative and Positive. Antibody Screen: Negative: No antibody detected Positive: Antibody detected, an identification workup will be completed to establish the specificity and clinical significance	Hemagglutination	Technical Manual. Current Edition. AABB.		
Type and Screen - Preadmission	**ANTIBODY SCREEN** Negative		ABO/Rh(D): Standard ABO/Rh(D) type will be reported. Routine ABO Types include: A, B, O, AB. Routine Rh(D) types include: Negative and Positive. Antibody Screen: Negative: No antibody detected Positive: Antibody detected, an identification workup will be completed to establish the specificity and clinical significance.	Hemagglutination	Technical Manual. Current Edition. AABB.		
BMT Panel 1				Flow cytometry immunophenotyping			
CD19 CAR T				Flow cytometry immunophenotyping	Known value, circulating CAR T can only be found in infused patients		CD3PERCENTTL: 0.1-100.0 % CD3PERTOT: 0.1-100.0 % CAR19PERTL: 0.1-100.0 % CARPLYM: 0.0-100.0 % CAR19PERCD3: 0.1-100.0 %
CD3EN				Flow cytometry immunophenotyping			
Helper/Suppressor Quant	**CD4/CD3 DUAL (T HELPER)%** 0-179 days: 30.0-57.0 % 180-365 days: 49.0-55.0 % 1-2 years: 46.0-51.0 % 2-3 years: 38.0-46.0 % 3+ years: 32.0-62.0 % **CD4/CD3 DUAL (T HELPER)** 266-2,213 ABS/mm3 **CD4/CD3 DUAL (T SUPPRESSOR)%** 11.0-40.0			Flow cytometry immunophenotyping	OSU Flow Lab established		
	CD3+: 59.0-92.0% **CD19+:** 2.0-21.0% **CD5616+/CD3-:** 3.0-25.0% **CD13+/HLA DR-:** No established reference range **CD13+/HLA DR+:** No established reference range **CD3+/CD69+:** 0.0-2.9% **CD3+/CD134+:** 0.0-0.5% **CD3+/HLADR+:** 0.0-5.6% **CD3+/CD69+/HLADR+:** 0.0-0.2% **CD3+/CD134+/HLADR+:** 0.0-0.1% **CD3+/CD69+/"CD134+:** 0.0-0.1% **CD3+/CD69+/CD134+/HLADR+:** 0.0-0.0% **CD3+/CD80+:** 0.0-0.2% **CD3+/CD86+:** 0.0-0.5% **CD3+/CD8b-:** 59.8-86.5% **CD3+/CD86-:** 59.7-86.3% **CD19+/CD80+:** 0.0-0.4% **CD19+/CD86+:** 0.0-0.5% **CD19+/CD8b-:** 3.6-20.5%	**CD3+:** 590-4416 ABS/mm3 **CD19+:** 17-750 ABS/mm3 **CD5616+/CD3-:** 25-893 ABS/mm3 **CD13+/HLA DR-:** No established reference range **CD13+/HLA DR+:** No established reference range **CD3+/CD69+:** 0-50 ABS/mm3 **CD3+/CD134+:** 0-95 ABS/mm3 **CD3+/HLADR+:** 0-139 ABS/mm3 **CD3+/CD69+/HLADR+:** 0-4 ABS/mm3 **CD3+/CD134+/HLADR+:** 0-2 ABS/mm3 **CD3+/CD69+/"CD134+:** 0-2 ABS/mm3 **CD3+/CD69+/CD134+/HLADR+:** 0-0 ABS/mm3 **CD3+/CD80+:** 0-5 ABS/mm3 **CD3+/CD86+:** 0-10 ABS/mm3 **CD3+/CD8b-:** 607-2519 ABS/mm3 **CD3+/CD86-:** 607-2517 ABS/mm3 **CD19+/CD80+:** 0-11 ABS/mm3 **CD19+/CD86+:** 0-14 ABS/mm3 **CD19+/CD8b-:** 121-557 ABS/mm3				

Immune Reconst Panel Flow Cytometry	**CD19+/CD86-:** 2.9-20.7% **CD19+/CD80-/CD86-:** 3.2-19.8% **CD19+/CD80+/CD86+:** 0.0-0.0% **CD3+/CD80-/CD86-:** 99.3-85.8% **CD3+/CD80+/CD86+:** 0.0-0.0% **CD4+/CD45RA+:** 6.4-36.3% **CD4+/CD45RO+:** 12.2-41.8% **CD8+/CD45RA+:** 14.3-45.8% **CD8+/CD45RO+:** 5.2-31.8% **CD4+/CD45RA+/*CD27-:** 0.0-0.8% **CD4+/*CD27+/CD45RA-/CD45RO-:** 0.0-12.7% **CD4+/CD45RA+/*CD27+:** 4.6-30.2% **CD4+/CD45RO+/*CD27-:** 0.0-8.0% **CD4+/CD45RO+/*CD27+:** 9.9-36.1% **CD8+/CD45RA+/*CD27-:** 0.0-15.0% **CD8+/*CD27+/CD45RA-/CD45RO-:** 0.0-0.1% **CD8+/CD45RA+/*CD27+:** 0.8-18.3% **CD8+/CD45RO+/*CD27-:** 0.0-4.7% **CD8+/CD45RO+/CD27+:** 0.0-12.9% **CD4+/CD45RA+/*CD29-:** 2.5-26.1% **CD4+/*CD29+/CD45RA-/CD45RO-:** 0.0-0.7% **CD4+/CD45RA+/*CD29+:** 0.3-5.9% **CD4+/CD45RO+/*CD29-:** 0.9-8.4% **CD4+/CD45RO+/*CD29+:** 8.7-34.6% **CD8+/CD45RA+/*CD29-:** 0.0-14.2% **CD8+/*CD29+/CD45RA-/CD45RO-:** 0.0-0.1% **CD8+/CD45RA+/*CD29+:** 2.6-18.1% **CD8+/CD45RO+/*CD29-:** 0.0-2.6% **CD8+/CD45RO+/*CD29+:** 0.0-14.4% **CD4+/CD31+:** No established reference range **CD8+/CD31+:** No established reference range **CD3+/CD49a+:** No established reference range **CD4+/CD49a+:** No established reference range **CD8+/CD49a+:** No established reference range **CD4+/*CD153+:** 0.0-0.1% **CD4+/*CD294+:** 0.0-0.8% **CD4+/*CD183+:** 6.7-30.5% **CD4+/*CD193+/*CD294+:** 0.0-0.0% **CD4+/*CD193+/*CD183+:** 0.0-0.0% **CD4+/*CD153+/*CD294+/*CD183+:** 0.0-0.0% **CD4+/*CD194+:** 0.0-27.8% **CD4+/*CD153+/*CD194+:** 0.0-0.0% **CD4+/*CD294+/*CD194+:** 0.0-0.2% **CD4+/*CD193+/*CD294+/*CD194+:** 8.9-32.5% **CD4+/CD25+:** 0.0-3.2% **CD4+/CD127+:** 30.6-53.9% **CD8+/CD25+:** 0.0-0.1% **CD8+/CD127+:** 6.7-24.6% **CD8+/CD127+/CD25-:** 6.3-24.3% **CD8+/CD25+/CD127-:** 0.0-0.0% **CD4+/CD25+/CD127-:** 0.0-2.1% **CD4+/CD25+/CD127+:** 0.0-1.4% **CD3+/AlphaBeta+:** 47.3-80.4% **CD3+/GammaDelta+:** 0.0-7.3% **CD3+/CD158b+:** 0.0-4.4% **CD3-/CD616-/CD69+:** 0.0-0.2% **CD3+/CD69+/CD158b+:** 0.0-0.1% **CD3-/CD616+/CD158b+:** 0.0-7.1% **CD3-/CD616+/CD69+:** 0.0-1.1% **CD3-/CD616+/CD69+/CD158b+:** 0.0-0.2% **CD3+/CD159a+:** 0.0-6.8% **CD3+/CD107a+/b+:** 0.0-0.3% **CD3+/CD159a+/CD107a+/b+:** 0.0-0.0% **CD3-/CD616+/CD107a+/b+:** 0.0-0.0% **CD3-/CD616+/CD159a+:** 0.0-11.6% **CD3-/CD616+/CD159a+/CD107a+/b+:** 0.0-0.0% **CD3+/CD314+:** 10.3-36.2% **CD3-/CD616-/CD63+:** 0.0-2.1% **CD3-/CD616-/CD314+:** 0.0-0.2% **CD3+/CD63+/CD314+:** 0.0-0.5% **CD3-/CD616+/CD314+:** 0.0-14.8% **CD3-/CD616+/CD63+/CD314+:** 0.0-0.2% **CD16-/CD56-/CD3-/CD17-:** 5.2-23.0% **CD16+/CD56-/CD3-/CD17-:** 0.0-5.2% **CD16-/CD56+/CD3-/CD17-:** 0.2-1.1% **CD16+/CD56+/CD3-/CD17-:** 0.0-17.9% **CD16-/CD56-/CD3+/CD17-:** 57.2-82.8% **CD16+/CD56-/CD3+/CD17-:** 0.0-1.6% **CD16-/CD56+/CD3+/CD17-:** 0.0-7.0% **CD16+/CD56+/CD3+/CD17-:** 0.0-2.1% **CD16+/CD56-/CD3+/CD17+:** 0.0-0.0% **CD16-/CD56+/CD3-/CD17+:** 0.0-0.2% **CD16+/CD56+/CD3-/CD17+:** 0.0-0.0% **CD16-/CD56-/CD3+/CD17+:** 0.0-0.0% **CD16-/CD56+/CD3+/CD17+:** 0.0-0.0% **CD16+/CD56+/CD3+/CD17+:** 0.0-0.0% □ □ □ □	**CD19+/CD86-:** 113-554 ABS/mm3 **CD19+/CD80-/CD86-:** 114-554 ABS/mm3 **CD19+/CD80+/CD86+:** 0-0 ABS/mm3 **CD3+/CD80-/CD86-:** 603-2502 ABS/mm3 **CD3+/CD80+/CD86+:** 0-0 ABS/mm3 **CD4+/CD45RA+:** 58-842 ABS/mm3 **CD4+/CD45RO+:** 146-1011 ABS/mm3 **CD8+/CD45RA+:** 187-1078 ABS/mm3 **CD8+/CD45RO+:** 133-816 ABS/mm3 **CD4+/CD45RA+/*CD27-:** 0-18 ABS/mm3 **CD4+/*CD27+/CD45RA-/CD45RO-:** 0-252 ABS/mm3 **CD4+/CD45RA+/*CD27+:** 0-783 ABS/mm3 **CD4+/CD45RO+/*CD27-:** 0-163 ABS/mm3 **CD4+/CD45RO+/*CD27+:** 94-901 ABS/mm3 **CD8+/CD45RA+/*CD27-:** 0-341 ABS/mm3 **CD8+/*CD27+/CD45RA-/CD45RO-:** 0-1 ABS/mm3 **CD8+/CD45RA+/*CD27+:** 0-426 ABS/mm3 **CD8+/CD45RO+/*CD27-:** 0-122 ABS/mm3 **CD8+/CD45RO+/CD27+:** 0-291 ABS/mm3 **CD4+/CD45RA+/*CD29-:** 131-666 ABS/mm3 **CD4+/*CD29+/CD45RA-/CD45RO-:** 0-17 ABS/mm3 **CD4+/CD45RA+/*CD29+:** 0-145 ABS/mm3 **CD4+/CD45RO+/*CD29-:** 2-201 ABS/mm3 **CD4+/CD45RO+/*CD29+:** 83-848 ABS/mm3 **CD8+/CD45RA+/*CD29-:** 0-331 ABS/mm3 **CD8+/*CD29+/CD45RA-/CD45RO-:** 0-2 ABS/mm3 **CD8+/CD45RA+/*CD29+:** 30-408 ABS/mm3 **CD8+/CD45RO+/*CD29-:** 0-56 ABS/mm3 **CD8+/CD45RO+/*CD29+:** 0-343 ABS/mm3 **CD4+/CD31+:** No established reference range **CD8+/CD31+:** No established reference range **CD3+/CD49a+:** No established reference range **CD4+/CD49a+:** No established reference range **CD8+/CD49a+:** No established reference range **CD4+/*CD153+:** 0-3 ABS/mm3 **CD4+/*CD294+:** 0-23 ABS/mm3 **CD4+/*CD183+:** 84-696 ABS/mm3 **CD4+/*CD193+/*CD294+:** 0-0 ABS/mm3 **CD4+/*CD193+/*CD183+:** 0-0 ABS/mm3 **CD4+/*CD153+/*CD294+/*CD183+:** 0-0 ABS/mm3 **CD4+/*CD194+:** 0-560 ABS/mm3 **CD4+/*CD153+/*CD194+:** 0-0 ABS/mm3 **CD4+/*CD294+/*CD194+:** 0-4 ABS/mm3 **CD4+/*CD193+/*CD294+/*CD194+:** 64-836 ABS/mm3 **CD4+/CD25+:** 0-68 ABS/mm3 **CD4+/CD127+:** 318-1487 ABS/mm3 **CD8+/CD25+:** 0-1 ABS/mm3 **CD8+/CD127+:** 55-624 ABS/mm3 **CD8+/CD127+/CD25-:** 50-616 ABS/mm3 **CD8+/CD25+/CD127-:** 0-0 ABS/mm3 **CD4+/CD25+/CD127-:** 0-43 ABS/mm3 **CD4+/CD25+/CD127+:** 0-30 ABS/mm3 **CD3+/AlphaBeta+:** 50-2158 ABS/mm3 **CD3+/GammaDelta+:** 0-135 ABS/mm3 **CD3+/CD158b+:** 0-89 ABS/mm3 **CD3-/CD616-/CD69+:** 0-5 ABS/mm3 **CD3+/CD69+/CD158b+:** 0-3 ABS/mm3 **CD3-/CD616+/CD158b+:** 0-178 ABS/mm3 **CD3-/CD616+/CD69+:** 0-24 ABS/mm3 **CD3-/CD616+/CD69+/CD158b+:** 0-6 ABS/mm3 **CD3+/CD159a+:** 0-170 ABS/mm3 **CD3+/CD107a+/b+:** 0-6 ABS/mm3 **CD3+/CD159a+/CD107a+/b+:** 0-0 ABS/mm3 **CD3-/CD616+/CD107a+/b+:** 0-0 ABS/mm3 **CD3-/CD616+/CD159a+:** 0-0 ABS/mm3 **CD3-/CD616+/CD159a+/CD107a+/b+:** 0-0 ABS/mm3 **CD3+/CD314+:** 80-929 ABS/mm3 **CD3-/CD616-/CD63+:** 0-48 ABS/mm3 **CD3-/CD616-/CD314+:** 1-6 ABS/mm3 **CD3+/CD63+/CD314+:** 0-11 ABS/mm3 **CD3-/CD616+/CD314+:** 0-356 ABS/mm3 **CD3-/CD616+/CD63+/CD314+:** 0-48 ABS/mm3 **CD16-/CD56-/CD3-/CD17-:** 1-619 ABS/mm3 **CD16+/CD56-/CD3-/CD17-:** 0-122 ABS/mm3 **CD16-/CD56+/CD3-/CD17-:** 3-24 ABS/mm3 **CD16+/CD56+/CD3-/CD17-:** 0-446 ABS/mm3 **CD16-/CD56-/CD3+/CD17-:** 570-2430 ABS/mm3 **CD16+/CD56-/CD3+/CD17-:** 0-36 ABS/mm3 **CD16-/CD56+/CD3+/CD17-:** 0-157 ABS/mm3 **CD16+/CD56+/CD3+/CD17-:** 0-49 ABS/mm3 **CD16+/CD56-/CD3+/CD17+:** 0-0 ABS/mm3 **CD16-/CD56+/CD3-/CD17+:** 0-3 ABS/mm3 **CD16+/CD56+/CD3-/CD17+:** 0-0 ABS/mm3 **CD16-/CD56-/CD3+/CD17+:** 0-0 ABS/mm3 **CD16+/CD56-/CD3+/CD17+:** 0-0 ABS/mm3 **CD16+/CD56+/CD3+/CD17+:** 0-0 ABS/mm3 □ □ □ □ □		Flow cytometry immunophenotyping	OSU Flow Lab established		
Immunodeficiency Batt Plus NK	**AlphaBeta** 47.0–80.0% **CD13** No established reference range **CD14** No established reference range **CD19** 2.0–21.0% **CD2** 70.0–92.0% **CD20** 2.0–21.0% **CD3** 59.0–92.0% **CD4** 32.0–62.0% **CD45RA** No established reference range **CD45RO** No established reference range **CD56/16** 3.0–25.0% **CD8** 11.0–40.0% **GammaDelta** 0.0–7.0% **HLA DR** No established reference range	**AlphaBeta** 550–2,158 ABS/mm3 **CD13** No established reference range **CD14** No established reference range **CD19** 17–750 ABS/mm3 **CD2** 581–3,284 ABS/mm3 **CD20** 17–750 ABS/mm3 **CD3** 490–3,284 ABS/mm3 **CD4** 266–2,213 ABS/mm3 **CD45RA** No established reference range **CD45RO** No established reference range **CD56/16** 25–893 ABS/mm3 **CD8** 91–1,425 ABS/mm3 **GammaDelta** 0–135 ABS/mm3 **HLA DR** No established reference range		Flow cytometry immunophenotyping			

Immunophenotyping	**CD10** No established reference range **CD13** No established reference range **CD14** No established reference range **CD19** 2.0-21.0% **CD2** 70.0-92.0% **CD20** 2.0-21.0% **CD23** No established reference range **CD3** 59.0-92.0% **CD4** 32.0-62.0% **CD5** No established reference range **CD56/16** 3.0-25.0% **CD7** No established reference range **CD8** 11.0-40.0% **HLA DR** No established reference range **KAPPA** No established reference range **LAMBDA** No established reference range	**CD10** No established reference range **CD13** No established reference range **CD14** No established reference range **CD19** 17-750 ABS/mm3 **CD2** 581-3,284 ABS/mm3 **CD20** 17-750 ABS/mm3 **CD23** No established reference range **CD3** 490-3,284 ABS/mm3 **CD4** 266-2,213 ABS/mm3 **CD5** No established reference range **CD56/16** 25-893 ABS/mm3 **CD7** No established reference range **CD8** 91-1,425 ABS/mm3 **HLA DR** No established reference range **KAPPA** No established reference range **LAMBDA** No established reference range		Flow cytometry immunophenotyping			
Transplant Battery	**CD4/CD3 DUAL (T HELPER)%** 0-179 days: 50.0-57.0 % 180-365 days: 49.0-55.0 % 1-2 years: 46.0-51.0 % 2-3 years: 38.0-46.0 % 3+ years: 32.0-62.0 % **CD4/CD3 DUAL (T HELPER)** 266-2,213 ABS/mm3 **CD4/CD3 DUAL (T SUPPRESSOR)%** 11.0-40.0 **CD4/CD3 DUAL (T SUPPRESSOR)** 91-1,428 ABS/mm3			Flow cytometry immunophenotyping	OSU Flow Lab established		
Transplant Battery Plus	**CD19** 2.0-21.0% 17-750 ABS/mm3 **CD2** 70.0-92.0% 581-3,284 ABS/mm3 **CD20** 2.0-21.0% 17-750 ABS/mm3 **CD3** 59.0-92.0% 490-3,284 ABS/mm3			Flow cytometry immunophenotyping	OSU Flow Lab established		
Acid Fast Culture	Smear: No acid fast bacillus seen Culture: No Growth		Organisms growing in pure culture are identified to the species level whenever possible.	Smear Culture Susceptibility (if appropriate)			**SMEAR:** No acid Fast Bacillus Seen Acid Fast Bacilli, Few Acid fast Bacilli, Rare Acid Fast Bacilli, Moderate Acid Fast Bacilli, Heavy
Anaerobic Culture	No growth			Culture Susceptibility (if appropriate)			
Bacterial Culture and Direct Smear, Lesion, Tissue, Device	No growth			Smear Culture Susceptibility (if appropriate)	Validation		
Bacterial Vaginosis Panel	Negative		This test was performed using Transcription Mediated Amplification for the detection of ribosomal RNA from bacteria associated with bacterial vaginosis.	Transcription-mediated amplification (TMA)	Package Insert Clinical Data		Negative, Positive
BAL Consult							BALQC: Acceptable, Unacceptable
Beta Strep, Vaginal Screen	Negative		This test was performed using a real-time PCR assay for the detection of Group B Streptococcus DNA.	Concentration in LIM broth for > 18 hours followed by real-time polymerase chain reaction (PCR) testing for Group B Streptococcus (GBS) DNA sequence	Package Insert Clinical Data		Negative, Positive
Beta Strep, Vaginal Screen, Reflex Susceptibility for Penicillin Allergy	Negative		This test was performed using a real-time PCR assay for the detection of Group B Streptococcus DNA.	Concentration in LIM broth for > 18 hours followed by real-time polymerase chain reaction (PCR) testing for Group B Streptococcus (GBS) DNA sequence	Package Insert Clinical Data		Negative, Positive
BK Virus DNA PCR, Quant, Urine	<200 IU/mL (<2.30 Log IU/mL)		This test was performed using a real time PCR assay. The dynamic range for this assay is 200-100,000,000 IU/mL (2.30-8.00 Log IU/mL).	Real-time polymerase chain reaction (RT-PCR)	Package Insert	BKSUT: 200-100,000,000 IU/mL (2.30-8.00 Log IU/mL)	BKSUT: 200-100,000,000 IU/mL (2.30-8.00 Log IU/mL)
BK Virus DNA Qn, PCR, Plasma	<21.5 IU/mL (<1.33 Log IU/mL)		This test was performed using a real time PCR assay. The dynamic range for this assay is 21.5-100,000,000 IU/mL (1.33 to 8.00 Log IU/mL).	Real-time polymerase chain reaction (RT-PCR)	Package Insert	BKSPT: 21.5-100,000,000.0 IU/mL BKVIRALP: 1.33-8.00 Log IU/mL	BKSPT: 21.5-100,000,000.0 IU/mL BKVIRALP: 1.33-8.00 Log IU/mL
Blood Culture	No growth			Culture Susceptibility (if appropriate)			
Blood Culture, AFB, Mycobacteria	Negative A final negative report will be issued after 42 days of incubation.		A positive result may support the diagnosis of mycobacteremia.	Culture PCR (if appropriate) Susceptibility (if appropriate)			
Blood Culture, Pediatric	No growth			Culture Susceptibility (if appropriate)			
Body Fluid Culture and Direct Smear	No growth			Smear Culture Susceptibility (if appropriate)			
C difficile 2 Step	Negative			Polymerase chain reaction (PCR) Toxin A/B: Rapid Membrane Enzyme Immunoassay	Package Insert		C DIFFICILE BY PCR: Negative, Positive C DIFFICILE TOXIN A/B: Negative, Positive
Candida Auris Screen by PCR	Not Detected		This test was performed using a real-time PCR assay.	Real-time polymerase chain reaction (RT-PCR)	Package Insert Literature		Not Detected, Detected
Candida/Trichomonas Panel	Not Detected (for all targets)		This test was performed using Transcription Mediated Amplification for the detection of ribosomal RNA from microorganisms associated with vulvovaginal candidiasis and trichomoniasis.	Transcription-mediated amplification (TMA)	Package Insert Clinical Data		Not Detected, Detected
CAPD Fluid Bacterial Culture	No growth			Gram Stain Culture Susceptibility (if appropriate)			
Chlamydia & Gonorrhea Amplified Probe	Not Detected (for all targets)			Transcription-mediated amplification (TMA)	Package Insert		Not Detected, Detected
CMV by PCR, Quantitative, Blood	<35.4 IU/mL (<1.54 Log IU/mL)		This test was performed using a real time CMV PCR assay. The dynamic range for this assay is 34.5-10,000,000 IU/mL (1.54-7.00 Log IU/mL). Results should be interpreted in conjunction with other clinical and laboratory.	Real-time polymerase chain reaction (RT-PCR)	Package Insert	34.5-10,000,000 IU/mL (1.54-7.00 Log IU/mL)	34.5-10,000,000 IU/mL (1.54-7.00 Log IU/mL)
EBV by PCR, Quantitative, Blood	<35 IU/mL (<1.54 Log IU/mL)		This test was performed using a real time PCR assay. The dynamic range for this assay is 35 IU/mL-100,000,000 IU/mL (1.54-8.00 Log IU/mL).	Real-time polymerase chain reaction (RT-PCR)	Package Insert	35-100,000,000 IU/mL (1.54-8.00 Log IU/mL)	35-100,000,000 IU/mL (1.54-8.00 Log IU/mL)
Fungus Culture	No growth		Positive cultures of yeast and filamentous fungi are reported with the organism identification.	Culture Susceptibility (if appropriate)			
Fungus Culture (Skin, Hair, Nails)	No growth		Positive cultures of yeast and filamentous fungi are reported with the organism identification.	Culture			
Fungus Smear				Smear			

Genital Culture, Bacterial	No growth	Isolation of anaerobes in significant numbers from well-collected specimens indicates infection with the identified organisms.	Culture Gram Stain (if appropriate) Susceptibility (if appropriate)			
H. Pylori Urea Breath Test	Negative		Infrared Spectrophotometry	Package Insert		Negative, Positive
Hepatitis B DNA	**HBV QUANT** <10 IU/mL	This test was performed using a real time HBV PCR assay. The dynamic range for this assay is 10-1,000,000,000 IU/mL (1.00-9.00 Logs).	Real-time polymerase chain reaction (RT-PCR)	Package Insert	HBDNA: 10-1,000,000,000 IU/mL HBDNAL: 1.00-9.00 IU/mL	HBDNA: ≥10 IU/mL HBDNAL: 1.00-9.00 IU/mL
Hepatitis C by PCR, Quant	**HCV QUANT** <15 IU/mL	This test was performed using a real time PCR assay. The dynamic range for this assay is 15-100,000,000 IU/mL (1.18-8.00 Logs).	Real-time polymerase chain reaction (RT-PCR)	Package Insert	HEPCQ: 15-100,000,000 IU/mL HEPCQL: 1.18-8.00 IU/mL	HEPCQ: ≥15 IU/mL HEPCQL: 1.18-8.00 IU/mL
HIV Viral Load RNA PCR Quant	**HIV QUANT** <20 copies/mL	This test was performed using a real time PCR assay. The dynamic range for this assay is 20-10,000,000 copies/mL (1.30-7.00 Logs)	Real-time polymerase chain reaction (RT-PCR)	Package Insert	HVRNA: 20-10,000,000 copies/mL HVRNAL: 1.30-7.00 copies/mL	HVRNA: ≥20 copies/mL HVRNAL: 1.30-7.00 copies/mL
HPV Human Papilloma Virus Genotyping w/o Pap Smear		**HPVG16:** Negative **HPVG18:** Negative **HPVGO:** Negative The assay detects HPV 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66, 68.	Polymerase chain reaction (PCR)	Package Insert		HPVG16: Negative, Positive HPVG18: Negative, Positive HPVGO: Negative, Positive
HPV Testing, Reflex to Cytology for All Positive Results		**HPVG16:** Negative **HPVG18:** Negative **HPVGO:** Negative The assay detects HPV 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66, 68.	Polymerase chain reaction (PCR)	Package Insert		HPVG16: Negative, Positive HPVG18: Negative, Positive HPVGO: Negative, Positive
HPV Testing, Reflex to Cytology for HPV Positive Other Category		**HPVG16:** Negative **HPVG18:** Negative **HPVGO:** Negative The assay detects HPV 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66, 68.	Polymerase chain reaction (PCR)	Package Insert		HPVG16: Negative, Positive HPVG18: Negative, Positive HPVGO: Negative, Positive
HSV by PCR, Fluid/Lesion	Not Detected (for all targets)	This test was performed using a real time PCR assay.	Real-time polymerase chain reaction (RT-PCR)	Package Insert Literature		HSV1: Not Detected, Detected HSV2: Not Detected, Detected
Immunocompromised Respiratory Panel	Not Detected (for all targets)	**NP** Results should be used in conjunction with other clinical and laboratory findings. This result does not rule out co-infections with pathogens that are not screened for by the Respiratory Panel(RP). This RP assay was performed using a Film Array multiplex nucleic acid assay. **BAL** Results should be used in conjunction with other clinical and laboratory findings. This result does not rule out co-infections with pathogens that are not screened for by the Respiratory Panel(RP). This RP assay was performed using a Film Array multiplex nucleic acid assay. This test was developed and its performance characteristics determined by The Clinical Microbiology Laboratory at The Ohio State University Wexner Medical Center. It has not been cleared or approved by the FDA. The laboratory is required under CLIA as qualified to perform high-complexity testing. This test is used for clinical purposes. It should not be regarded as investigational or for research.	Multiplex polymerase chain reaction (PCR)	Package Insert Literature		All Targets: Not Detected, Detected
Influenza A/B Rapid Molecular	Not Detected (for all targets)	This test utilizes isothermal nucleic amplification technology for the differential qualitative detection of influenza A and influenza B viral nucleic acids.	Isothermal nucleic acid amplification	Abbott ID NOW Influenza A & B 2 package insert		All Targets: Not Detected, Detected, Indeterminate
Influenza A/B, RSV By PCR	Not Detected (for all targets)	This test was performed using a multiplex real time PCR assay. This result does not rule out co-infections with pathogens that were not screened for by this test. Results should be used in conjunction with other clinical and laboratory findings.	Polymerase chain reaction (PCR)	Validation		All Targets: Not Detected, Detected, Indeterminate
Legionella Culture	No growth	Identification of Legionella species from respiratory specimens provides a definitive diagnosis of Legionnaires disease.	Culture			
Lower Respiratory Culture, Bacterial	No growth		Gram Stain Culture Susceptibility (if appropriate)			
M.Tuberculosis Complex by PCR	Not Detected	This test should always be performed in conjunction with AFB (acid fast bacilli) smear and culture. This test was performed using a Multiplex PCR Test.	Real-time polymerase chain reaction (RT-PCR)	Package Insert Reference Materials		Not Detected, Detected
Meningitis/Encephalitis Panel CSF	Not Detected (for all targets)	A negative result does not exclude the possibility of CNS infection and should not be used as the sole basis for diagnosis, treatment, or other management decisions. Negative results may occur when the concentration of organism(s), virus(es), or yeast in the specimen is below the limit of detection. The ME panel does not distinguish between latent and active herpesvirus infections(CMV, HHV-6). This test was performed using a film array method for the detection of: *Escherichia coli* K1, *Haemophilus influenza* , *Listeria monocytogenes* , *Neisseria meningitidis* , *Streptococcus agalactiae* , *Streptococcus pneumoniae* , Cytomegalovirus, Enterovirus, Herpes Simplex virus 1 and 2, Human Herpesvirus 6, Human parechovirus, Varicella zoster virus, and *Cryptococcus neoformans/gattii* .	Multiplex polymerase chain reaction (PCR)	Package Insert		All Targets: Not Detected, Detected
Molecular Enteric Panel, Stool	Negative (for all targets)	This test was performed using a real time PCR assay. Results should be interpreted in conjunction with clinical findings. A positive result does not necessarily indicate the presence of viable organisms. Positive results do not rule out co-infection with other organisms that are not detected by this assay. For Shiga toxin, this assay detects Shiga toxin 1 / Shiga toxin 2 genes (found in Shiga toxin-producing E. coli as well as Shigella dysenteriae). This test should not be used as a test of cure.	Real-time polymerase chain reaction (RT-PCR)	Package Insert		All Targets: Negative, Positive
Molecular Stool Parasite Panel	Negative (for all targets)	This test was performed using a real time PCR assay. Results should be interpreted in conjunction with clinical findings. A positive result does not necessarily indicate the presence of viable organisms. Positive results do not rule out co-infection with other organisms that are not detected by this assay. This test should not be used as a test of cure.	Real-time polymerase chain reaction (RT-PCR)	Package Insert Reference Materials		All Targets: Negative, Positive
Neisseria-Gonococcus Screen	No growth		Culture			
Novel Coronavirus PCR - Semi-Private Surveillance	Not Detected	Negative results do not preclude SARS-CoV-2 infection and should not be used as the sole basis for treatment or other patient management decisions. Optimum specimen types and timing for peak viral levels during infections caused by SARS-CoV-2 has not been determined. The possibility of a false negative result should especially be considered if the patient's recent exposures or clinical presentation suggest that SARS-CoV-2 infection is probable, and diagnostic tests for other causes of illness (e.g., other respiratory illness) are negative. Collection of a new specimen and re-testing may be necessary if the patient is critically ill or clinically deteriorating.	Real-time polymerase chain reaction (RT-PCR)	Package Insert		Not Detected, Detected
Novel Coronavirus PCR - Nasopharyngeal	Not Detected	Negative results do not preclude SARS-CoV-2 infection and should not be used as the sole basis for treatment or other patient management decisions. Optimum specimen types and timing for peak viral levels during infections caused by SARS-CoV-2 has not been determined. The possibility of a false negative result should especially be considered if the patient's recent exposures or clinical presentation suggest that SARS-CoV-2 infection is probable, and diagnostic tests for other causes of illness (e.g., other respiratory illness) are negative. Collection of a new specimen and re-testing may be necessary if the patient is critically ill or clinically deteriorating.	Real-time polymerase chain reaction (RT-PCR)	Package Insert		Not Detected, Detected
Plesiomonas/Aeromonas Screen, Stool	Negative for Aeromonas species Negative for Plesiomonas species		Culture Susceptibility (if appropriate)			
Quantitative Tissue Culture	No growth		Tissue is weighed, serially diluted, and cultured for exact colony count.			
Rapid Malaria	Negative for malaria antigens	Infection due to malaria cannot be entirely ruled out. Malaria antigen in the sample may be below the detection limit of the test. Results should be interpreted in conjunction with the thick and thin malaria preparation/microscopy.	Immunochromatographic membrane assay	Package Insert		Negative for malaria antigens, Positive rapid malaria test for P. falciparum protein antigen only. Positive rapid malaria test for malaria protein antigen, representing P. vivax or P. malariae or P. ovale or a mix of species, Positive rapid malaria test. Positive for P. falciparum protein antigen
Rapid Strep A, Molecular	Negative		Molecular in vitro diagnostic test utilizing isothermal nucleic acid amplification.	Abbott ID NOW Strep A 2 package insert		Negative, Positive
Rectal Screening for Cipro Resistance	Negative for Ciprofloxacin Resistant Enterobacterales		Culture Susceptibility (if appropriate)			
SARS-COV-2 Rapid	Not Detected	Negative results do not preclude SARS-CoV-2 infection and should not be used as the sole basis for treatment or other patient management decisions. Optimum specimen types and timing for peak viral levels during infections caused by SARS-CoV-2 has not been determined. The possibility of a false negative result should especially be considered if the patient's recent exposures or clinical presentation suggest that SARS-CoV-2 infection is probable, and diagnostic tests for other causes of illness (e.g., other respiratory illness) are negative. Collection of a new specimen and re-testing may be necessary if the patient is critically ill or clinically deteriorating.	Isothermal nucleic acid amplification	Abbott ID NOW Rapid Covid package insert		Not Detected, Detected
Screen: MRSA Only	Negative		Culture on select agar			Negative, Positive
Screen: MRSA/MSSA	**PCR** Negative	This test was performed using a real time PCR assay. Results should be interpreted in conjunction with other clinical and laboratory findings. A positive result does not necessarily indicate the presence of viable organism. This test should not be used as a test of cure.	Real-time polymerase chain reaction (RT-PCR)	Package Insert		Staphylococcus aureus by PCR: Negative, Positive Methicillin Resistant S. aureus by PCR: Negative, Positive
Screen, VRE	Negative		Culture on select agar			Negative, Positive
Screen, Yeast	Negative		Culture			
Sinus Culture	No growth		Gram Stain Culture Susceptibility (if appropriate)			
Strep Pneumoniae Antigen, Urine	Negative		Immunochromatographic membrane assay	Binax NOW Package Insert		Negative, Positive
Upper Respiratory Culture, Bacterial	No growth		Culture			
Urine Culture	Negative		Culture Susceptibility (if appropriate)			
Vaginal Infection Panel	BVAG: Negative CV: Not Detected TV: Not Detected CT: Not Detected NG: Not Detected	**BV:** This test was performed using Transcription Mediated Amplification for the detection of ribosomal RNA from bacteria associated with bacterial vaginosis. **CVTV:** This test was performed using Transcription Mediated Amplification for the detection of ribosomal RNA from microorganisms associated with vulvovaginal candidiasis and trichomoniasis. **CTNG:** This test was performed using Transcription Mediated Amplification for the detection of Chlamydia trachomatis and/or Neisseria gonorrhoeae nucleic acid. This assay is not intended for the evaluation of suspected sexual abuse or other medico-legal indications.	Transcription Mediated Amplification	See individual analytes		See individual analytes
Varicella Zoster By PCR, Skin	Not Detected	This test was performed using a real time PCR assay.	Real-time polymerase chain reaction (RT-PCR)	Package Insert Literature		Not Detected, Detected
ADAMTS13 Activity and IgG Ab w/ Reflex to Inhibitor	**ACTIVITY** No established reference range **IGG** ≤12.0 U/mL		Technozym enzyme-linked immunosorbent assay (ELISA)	Technozym kit	ACTIVITY: 2-100 % IGG: 6.0-104.0 U/mL	ACTIVITY: 2-100 % IGG: 6.0-104.0 U/mL
Alternative Activation Pathway	695-1,974 ng/mL		Quidel enzyme-linked immunosorbent assay (ELISA)	Biomarker Reference Lab		
Terminal Activation Pathway	6-598 ng/mL		Quidel enzyme-linked immunosorbent assay (ELISA)	Biomarker Reference Lab		