

Hamilton Regional Laboratory Medicine Program

Laboratory Reference Intervals

Site: HHS (HGH, Juravinski & MUMC) and St. Joseph's Healthcare

Date Created: April 2002

Date of Review: February 2004

Date of Review: June 2006

Date of Review: July 2007, St. Joseph's Healthcare went live with Meditech as of June 18, 2007.

Date of Review: August 2009

Date of Review: December 2011; updates made June 2012;

further updates made due to New Chemistry Instrument November 2012

Date of Review: December 2014

Date of Review: December 2016

Date of Review: January 2019

Test Name	R.I.	Units	Comments	Effective Date
Leukocytes	4.0 - 11.0	x10 ⁹ /L		
Erythrocytes	4.50 - 6.50	x10 ¹² /L	Male	
	3.80 - 5.80	x10 ¹² /L	Female	
Hemoglobin	130 - 180	g/L	Male	
	115 - 165	g/L	Female	
Hematocrit	0.400 - 0.540	L/L	Male	
	0.370 - 0.470	L/L	Female	
MCV	82 - 99	fL		
MCH	27 - 32	pg		
MCHC	315 - 353	g/L		20/04/17
R.D.W.	11.5 - 15.0	%		31/01/08
Platelets	150 - 400	x10 ⁹ /L		
M.P.V.	9.3 - 12.5	fL		20/04/17

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Absolute Neutrophils	2.0 - 7.5	x10 ⁹ /L		24/01/08
Absolute Lymphocytes	1.5 - 4.0	x10 ⁹ /L		
Absolute Monocytes	0.2 - 0.8	x10 ⁹ /L		
Absolute Eosinophils	0.0 - 0.4	x10 ⁹ /L		
Absolute Basophils	0.0 - 0.1	x10 ⁹ /L		
Reticulocyte Count	10 - 86	x10 ⁹ /L		
Erythrocyte Sedimentation Rate	0 - 15 0 - 20	mm/h mm/h	Male Female	28/06/07
Vitamin B12	138 - 652	pmol/L		28/11/12
ERC Folate	<317	nmol/L	Deficient	17/01/13
PT in INR	0.8 - 1.2		Therapeutic Range: 2.0-3.0 Mechanical mitral and high-risk aortic values: 2.5-3.5	23/02/05 (Mechanical valve 06/06/06)
APTT	22 - 35	s	Heparin Therapeutic Range: 60-85s	17/11/04
Clauss Fibrinogen	1.6 - 4.2	g/L		
TCT 2 unit	20 - 30	s		
D-Dimer	<500	ug/L FEU	Quantitative Method	06/07/11
Albumin	35 - 50	g/L		
Alkaline Phosphatase	40 - 120	U/L		
Alpha Fetoprotein	<10	ug/L		20/01/13
ALT	≤40 ≤28	U/L U/L	Male Female	28/11/12
Ammonia	18 - 72	umol/L		28/11/12
Amylase	<100	U/L		28/11/12
Apolipoprotein A1	0.99 - 1.86 1.09 - 2.04	g/L g/L	Male Female Ratio of Apo B/Apo A1 is important for CVD risk	27/06/14

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Apolipoprotein B		g/L	Intermediate and High Risk CVD target Apo B is <0.80g/L	27/06/14
AST	<35	U/L		
Beta-hCG, Total	<5	IU/L		28/11/12
Bile Acid, Total	<6.7	umol/L		21/04/11
Bilirubin, Conjugated	≤9.0	umol/L		25/01/13
Bilirubin, Total	<21	umol/L		28/11/12
Blood Gases:				
H+ Arterial	35 - 45	nmol/L		
pH Arterial	7.35 - 7.45			
pCO2 Arterial	35 - 45	mmHg		
pO2 Arterial	80 - 100	mmHg		
Bicarbonate Calculated	22 - 26	mmol/L		23/10/09
Base Excess	-2 to +3	mmol/L		
O2 Saturation Measured Arterial	0.94 - 0.98	Fract		
Carboxyhemoglobin, Arterial	0.00 - 0.04	Fract	Heavy smokers may show up to 0.10	
Methemoglobin	0.000 - 0.020	Fract	Methemoglobin levels >0.1 are compatible with cyanosis	
CA125	≤35	kU/mL		20/01/13
Calcium (total)	2.15 - 2.55	mmol/L		
Carotene	0.9 – 3.7	umol/L		06/01/09
Chloride	98 - 107	mmol/L		
Cholesterol		mmol/L	Target Values: Desirable Total Cholesterol: <5.20 mmol/L High Risk / Secondary CVD Prevention: ≤4.00 mmol/L	20/06/12
CK (Creatine Kinase)	<200 <168	U/L U/L	Male Female	28/11/12

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Test Name	R.I.	Units	Comments	Effective Date
CK-2 (CKMB)	≤7.2 ≤3.4	ug/L ug/L	Male Female	28/11/12 Study use only. No longer available.
Total CO2	22 - 29	mmol/L		28/11/12
Cortisol	200 - 660 80 - 400 <140	nmol/L nmol/L nmol/L	0800h Specimen 1600h Specimen 2400h Specimen	
C-Peptide	298 -2350	pmol/L		15/10/07
Creatinine	64 - 111 50 - 98	umol/L umol/L	Male Female	28/11/12
C-Reactive Protein	≤5.0	mg/L		28/11/12
DHEA-Sulphate	2.8 - 12.4 2.1 - 9.1 1.5 - 6.6 1.1 - 4.8 0.8 - 3.5 0.0 - 2.6 1.0 - 8.7 0.0 - 6.7 0.0 - 5.1 0.0 - 3.9 0.0 - 3.0 0.0 - 2.3	umol/L umol/L umol/L umol/L umol/L umol/L umol/L umol/L umol/L umol/L umol/L umol/L	Male, 19-29 years Male, 30-39 years Male, 40-49 years Male, 50-59 years Male, 60-69 years Male, ≥70 years Female, 19-29 years Female, 30-39 years Female, 40-49 years Female, 50-59 years Female, 60-69 years Female, ≥70 years	
Digoxin		nmol/L	Therapeutic Range in Heart Failure: 0.7 - 1.4 nmol/L Toxic (>6 hours post-ingestion): ≤2.6 nmol/L	06/10/15

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Test Name	R.I.	Units	Comments	Effective Date
Estradiol	<162	pmol/L	Male Female Follicular: 77 - 921 pmol/L Mid Cycle: 139 - 2382 pmol/L Luteal: 77 - 1145 pmol/L Post Menopausal (no HRT): <103 pmol/L Post Menopausal (on HRT): <529 pmol/L	05/01/17
Ferritin	<23 24 - 50 51 - 140 141 - 400 >400	ug/L ug/L ug/L ug/L ug/L	Probably iron deficient Possibly iron deficient Probably not iron deficient Not iron deficient Possibly iron overload	12/07/04
Follicle Stimulating Hormone	1.0- 12.0	IU/L	Male Female Follicular: 3.0 - 8.1 IU/L Mid-cycle: 2.6 - 16.7 IU/L Luteal: 1.4 - 5.5 IU/L Postmenopausal: 26.7 - 133.4 IU/L	28/11/12
Fructosamine	205 - 285	umol/L		03/07/14
Gastrin, Fasting	13 - 115	ng/L		01/12/04
GGT (Gamma Glutamyl Transpeptidase)	<65 <37	U/L U/L	Male Female	28/11/12
Glucose, Fasting	3.8 - 6.0	mmol/L	3.8 – 6.0 Normal 6.1 – 6.9 Impaired FBG ≥7.0 Abnormal FBG	
Glucose, Random	3.8 - 11.0	mmol/L		20/06/12
HbA1C	0.040 - 0.060	Fract.		

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Test Name	R.I.	Units	Comments	Effective Date
HDL -Cholesterol		mmol/L	Target Values: ≥1.30 mmol/L Desirable <1.04 mmol/L Low HDL-C (Increases risk of CVD) ≥1.55 mmol/L High HDL-C (Optimal)	20/06/12
Human Growth Hormone	≤3.0 ≤8.0	ug/L ug/L	Male Female	19/04/11
IgA	0.70 - 3.52	g/L		
IgD	7.7 - 132.1	mg/L		19/08/13
IgE	<87	KIU/L		21/11/18
IgG	6.35 - 14.65	g/L		
IgM	0.41 - 2.07	g/L		
Insulin	<120	pmol/L	Fasting	21/07/10
Iron	12 - 31 9 - 30	umol/L umol/L	Male Female	08/05/12
Iron Binding Capacity	40 - 80	umol/L		
Lactate	0.5 - 2.2	mmol/L		
LD (Lactate Dehydrogenase)	100 - 220	U/L		
LDL - Cholesterol		mmol/L	Target Values: Desirable Total Cholesterol: <5.20 mmol/L High Risk/Secondary CVD Prevention: ≤4.00 mmol/L	25/01/13
Lipase	<79	U/L		28/11/12
Lithium	0.5 - 1.1	mmol/L	Toxic: >1.5 mmol/L	20/06/12
Magnesium	0.66 - 1.07	mmol/L		28/11/12
Osmolality	280 - 300	mmol/kg		

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Parathyroid Hormone (PTH Intact)	2.0 - 9.4	pmol/L		07/07/14
Phosphate	0.80 - 1.45	mmol/L		28/11/12
Potassium	3.5 - 5.0	mmol/L		
Prealbumin	0.18 – 0.38	g/L		20/06/14
Progesterone	<0.7	nmol/L	Male Female Progesterone reference interval varies with menstrual cycle. Follicular Phase: <1.0 nmol/L Luteal Phase: 3.8 - 50.6 nmol/L Postmenopausal: <0.7 nmol/L 1st Trimester: 8.9 - 468.4 nmol/L 2nd Trimester: 71.6 - 303.1 nmol/L 3rd Trimester: 88.7 - 771.2 nmol/L	28/11/12
17-Hydroxy Progesterone	1.5 – 6.4	nmol/L	Male Female – Reproductive age: Follicular: 0.3 – 2.4 mmol/L Luteal: 1.8 – 7.0 mmol/L Ovulation: 0.9 – 4.2 mmol/L Post Menopausal: 0.4 – 1.5 mmol/L	24/08/10
PSA, Total	<4.0	ug/L	Male	
Sodium	135 - 145	mmol/L		
Calculated Testosterone, Free	320 - 800 250 - 700 210 - 600 190 - 500 170 - 500 160 - 400	pmol/L pmol/L pmol/L pmol/L pmol/L pmol/L	Male, 20-29 years Male, 30-39 years Male, 40-49 years Male, 50-59 years Male, 60-69 years ≥70 years Female, Menstrual Cycle: Oral Contraceptive Use: 3 - 26 pmol/L No Oral Contraceptive Use: 7 - 53 pmol/L	20/02/15

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Test Name	R.I.	Units	Comments	Effective Date
Testosterone, Total	5.5 – 25.2 4.5 - 26.6 ≤2.5 ≤1.5	nmol/L nmol/L nmol/L nmol/L	Male, 20-49 years Male, ≥50 years Female, Ovulating Female, Post-menopausal	17/03/11
Theophylline		umol/L	Bronchodilation: 55 - 110 umol/L Premature Apnea: 33 - 70 umol/L Toxic: >110 umol/L	26/02/18
Thyroxine (T4)	58 - 154	nmol/L		
Thyroxine, Free	9.0 - 19.0	pmol/L		28/11/12
T3 Triiodothyronine, Free (T3, Free)	2.76 - 6.45	pmol/L		26/02/14
T3 Triiodothyronine (Total T3)	0.9 - 2.4	nmol/l		28/11/12
Total Protein	60 - 80	g/L		
Transferrin	1.74 - 3.64 1.80 - 3.82	g/L g/L	Male Female	28/11/12
Triglycerides	<1.70	mmol/L	High Triglycerides increases risk for CVD; >10 mmol/L increases risk for pancreatitis	20/06/12
Troponin T			Not available	28/11/12
Troponin I			Not available	25/11/14
Troponin I - HS		ng/L	≤30 ng/L No evidence of Myocardial Injury >30 ng/L Evidence of Myocardial Injury	25/11/14
TSH (Thyrotropin)	0.35 - 4.90	mIU/L		16/10/14
Urate (Uric Acid)	208 - 428 155 - 357	umol/L umol/L	Male Female	28/11/12
Urea	3.2 - 7.4 2.5 - 6.7 3.0 - 9.2 3.5 - 7.2	mmol/L mmol/L mmol/L mmol/L	Male, 19-49 years Female, 19-49 years Male, ≥50 years Female, ≥50 years	14/12/12
Valporic Acid	350 - 700	umol/L		

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25-Hydroxy Vitamin D		nmol/L	<25 nmol/L Vitamin D deficiency 25-75 nmol/L Sub-optimal Vitamin D Status >75 nmol/L Desirable Vitamin D Status >250 nmol/L Potential Adverse Effects	01/04/12
Urinalysis:				
Routine:				
Glucose	Negative			
Ketones	Negative			
Specific Gravity	1.005 - 1.030			20/06/12
Blood	Negative			
pH	5.0 - 8.0			
Protein	Negative			
Nitrates	Negative			
Leukocyte Screen	Negative			
Microscopic:				
Ercs	0 - 3	/HPF		
Lkcs	0 - 5	/HPF		
Epithelial Cells	No Defined Reference Range			
Urine Bilirubin	Negative			
Urobilinogen		EU/dL	Normally present in urine at concentrations up to 1 EU/dL	

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Test Name	R.I.	Units	Comments	Effective Date
Sputum	No Defined Reference Range		Cultures are processed and reported for pathogens clinically significant for the site collected; normal (colonizing) flora is not considered clinically significant.	

Josephine Baldwin

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Laboratory Research Coordinator