

Procedure: Chemistry Reference Ranges Version 2.0	Rev. 10	Section: CCO100
Site: Main Laboratory	Manual: Chemistry	
Distribution: Kelowna , Osoyoos, Penticton Vernon	Controlled Document: 1of 14	
Reviewed:		
Written by: John Krol	Date: November 3, 2014	
Approved by:	Date:	

**TITLE: Chemistry Adult and Pediatric Reference Ranges**

TEST NAME	TEST ABBRV	RANGE	UNITS
<b>ROUTINE CHEMISTRY</b>			
Normal Fasting Blood Sugar Impaired Fasting Blood Sugar Diabetic Fasting Blood Sugar	FBS	3.9-6.0 6.1-6.9 (on 2 occasions) ≥ 7.0 (on 2 occasions)	mmol/L
Normal Random Blood Sugar Diabetic Random Blood Sugar	RBS	3.9- 11.0 ≥11.1(+ diabetic symptoms)	mmol/L
2 Hour 75G Glucose 2 Hour 75 G (Impaired Glucose Tolerance) 2 Hour 75 G (Diabetic)	2 H75	<7.8 7.8 – 11.0 ≥ 11.1	mmol/L
2 Hour Meal Glucose	2HML	<11.1	mmol/L
1 Hr 50G Glucose	1HR50	<7.8	mmol/L
2 HR GDM DOSE 75g Revised: November 15, 2010 based on HAPO(2008) & IADPSG recommendations.	2HGD	FBS: <5.1 1 Hr: <10.0 2 Hr: <8.5	mmol/L
Albumin	ALB	35 – 50	g/L
A/G Ratio March 14, 2011	A/G Ratio	1.0 - 2.5	
Alkaline Phosphatase	ALP	M/F: 0-5 days <300 6 dys-6 mos <320 7 mos – 1 yr <460 1 yr – 3 yrs <320 4- 11 yrs <400 F: 12-13 yrs <400 M: 12-13 yrs <420 F: 14-15 yrs <230 M: 14-15 yrs <470 F: 16-17 yrs <190 M: 16-17 yrs <390	U/L

Alkaline Phosphatase	ALP	F: >18 yrs <105 M: >18 yrs <130	U/L
Alanine Aminotransferase	ALT	M/F: <1 yr <50 F: >1 yr <30 M: >1 yr <50	U/L
Amylase	AMY	<110	U/L
Anion Gap	ANION	5 – 14	mmol/L
APO B-100	APOB If patient is:	Low Risk: <1.25 Moderate to High Risk: <0.80	g/L
AST	AST	<1 yr <72 >1 yr <30	U/L
Bicarbonate(HCO <sub>3</sub> )	BICAR	23 – 28	mmol/L
Bilirubin – Direct (Conjugated)	BILID	< 14 days <20 >14 days <7 >1 yr <6	umol/L
Bilirubin – Total  * Please refer to Bhutani Nomogram for Assessment of risk of neonatal hyperbilirubinemia, available on request	BILIT	*12 – 24 hrs <85 *1-2 days <120 *2-5 days <190 *5- 10 days <255 >10 days <17	umol/L
Calcium * <10 days Hold for Path Comment	CA	* <sub>≥</sub> 10 days 2.12 - 2.62	mmol/L
Cholesterol	CHOL	F: < 9 yrs <4.89 <14 yrs <4.94 <19 yrs <5.12 M: < 9 yrs <4.73 <14 yrs <4.94 <19 yrs <4.73 M/F: >19 yrs <4.60 M/F: >30 yrs <5.20	mmol/L
Chloride	CL	98 – 109	mmol/L
Creatine Kinase (CK)	CK	<175	U/L
Creatinine	CREAT	0-30 days 10-90 31 days- 3 yrs 10-50 4 – 9 yrs 10-60 10 – 13 yrs 40-90 M: >14 yrs 64-100 F: > 14 yrs 52-84	umol/L

C-Reactive Protein	CRP	0.00 - 5.00	mg/L
Gamma Glutamyl Transferase	GGT	<55	U/L
High Density Lipoprotein *not reported if TRIG >20.00	HDL	F: < 9 yrs >0.98 <14 yrs >1.03 <19 yrs >0.98 M: < 9 yrs >1.11 <14 yrs >1.03 <19 yrs >0.88 M/F: >19 yrs >0.90	mmol/L
IgA	IgA	<= 1 yr <1.03 2-3 yr 0.38-1.81 4-6 yr 0.40-2.15 7-9 yr 0.45-2.37 10-15 yr 0.56-2.87 16-17 yr 0.65-3.38 >18 yr 0.70-4.00	g/L
IgG	IgG	<=3 m 2.2-15.5 4-6 m 3.1-13.6 7-9 m 4.1 -11.7 10m - 3 yr 3.4-11.6 4-6 yr 4.9-12.1 7-9 yr 5.3 -12.8 10-15 yr 5.7-14.3 >19 yr 6.3-14.9	g/L
IgM	IgM	<= 2 m 0.32-1.28 3m - 4 yr 0.40-1.61 5 - 19 yr 0.56-2.14 >20 yr 0.40-2.30	g/L
Iron Total Iron Binding Capacity Fraction Saturation	FE TIBC FRSAT	6 - 31 35 - 70 0.20-0.45	umol/L umol/L
Lactate Dehydrogenase  <i>Note: The LDH methodology changed effective Nov. 3, 2014. The new reference values are approximately 50% of the old method reference values.</i>	LDH	M/F: < 1 day <743 < 5 days <969 < 6 mos. <545 <1 yr. <615 <3 yr <475 <6 yr <344 F: 7 - 12 yr <324 M: 7 - 12 yr <427 F: 13-17 yr <244 M: 13 - 17 yr <382 M/F: > 17 yr <250	U/L

Lipase	LIPA	< 12 yrs <35 ≥ 12 yrs <60	U/L
Low Density Lipoprotein  *INVALID IF TRIG>4.50 (calculation using CHOL, HDL AND TRIG)	LDL	F: < 9 yrs <3.23 <14 yrs <3.26 <19 yrs <3.34 M: < 9 yrs <3.03 <19 yrs <3.18 M/F: >19 yrs <3.40	mmol/L
Magnesium	MG	0.70-1.00	mmol/L
Phosphorus	PO4	1-30 days 1.25-2.50 1-12 mos 1.15-2.15 1-18 yrs 1.00-1.90 > 18 yrs 0.80-1.45	mmol/L
Potassium	K	3.5 - 5.0	mmol/L
Rheumatoid Factor	RA	<14	kU/L
Sodium	NA	135-145	mmol/L
Total Protein	PROT	60 – 80	g/L
Triglyceride	TRIG	F: < 9 yrs <1.16 <14 yrs <1.18 <19 yrs <1.27 M: < 9 yrs <0.79 <14 yrs <1.06 <19 yrs <1.41 M/F: >19 yrs <2.26	mmol/L
Urate	URATE	F: 119- 386 M: <12 yrs 119- 386 M ≥ 12 yrs 178- 476	umol/L
Urea	UREA	2.0-7.0	mmol/L

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<u>TEST NAME</u>	<u>TEST ABBRV</u>	<u>RANGE</u>	<u>UNITS</u>
<u>IMMUNOASSAY</u> <u>CHEMISTRY</u>			
<b>ANTI-TPO</b> <b>April 20, 2012</b>	<b>ATPO</b>	<b>&lt;50</b>	<b>kIU/L</b>
BHCG Quant.	BHCGQ	>25 Pregnant 5-25 Consistent with early pregnancy <5 Not pregnant M: <5	IU/L
<b>Cortisol – AM 8 – 10 a.m.</b> <b>Nov. 25, 2011</b>	<b>CORTA</b>	<b>&lt; 16 yrs 83-580</b> <b>≥16 yrs 138-690</b>	<b>nmol/L</b>
Cortisol – PM 4 – 5 p.m.	CORTP	½ AM result	nmol/L
Cortisol Random	CORTR	55 – 690	nmol/L
Dex. Supression Test –Cort.AM	ACORT	<80	nmol/L
DHEA Sulphate Nov. 16, 2010	DHEA-S	Female: <5 yrs <1.5 6-9 yrs 0.1-3.8 10-11yrs 0.4-7.0 12-17yrs 0.5-14.4 18-50yrs 1.4-14.7 >50 yrs 0.8-7.0 Male: <5 yrs <1.1 6-9 yrs 0.1-3.9 10-11yrs 0.4-3.1 12-17yrs 0.5-15.0 18-50yrs 4.6-18.2 >50yrs 0.5-11.1	umol/L
Estradiol	ESTRA	Female: Prepubertal: <90 Mid-follicular: 110-184 Ovulatory peak: 550-1650 Mid- luteal: 550-845 Postmenopausal: <=220 Male: < 11 yrs <90 > 11 yrs <220	pmol/L
Ferritin March 30, 2006	FERR	F: 6 months -17 yrs: 40-200 >17 yrs: 40-200  M: 6 months -17 yrs: 40-200 >17: 40-300	ug/L

Follicle Stimulating Hormone	FSH	Female: Prepubertal: <3.0 Follicular/Luteal: <9.0 Mid-Cycle: 4.0-20.0 Postmenopausal: 20.0-135 Male: <10 yrs <3.0 >10 yrs <10.0	IU/L
Free T4 - Free Thyroxine	FT4	11.0 - 23.0	pmol/L
IgE May 4, 2010	IgE	<1 yr <282 1-4 yrs <752 5-10 yrs <1332 11-15 yrs <1154 >15 yrs <423	ug/L
Intact PTH	PTH	1.2 – 8.4	pmol/L
Luteinizing Hormone	LH	Female: Prepubertal: <3.0 Follicular/Luteal <13.0 Mid-Cycle: 14.0-100.0 Postmenopausal: 15.0-65.0 Male: <10 yrs <3.0 >10 yrs <10.0	IU/L
Progesterone	PROG	Female: Follicular: <5.0 Luteal: 16 - 95 Prepubertal: <5.0 Postmenopausal: <5.0 Male: <5.0	nmol/L
Prolactin	PROL	Female: 2.7 - 26 Postmenopausal: 1.8 - 17.9 Male: 2.0 - 14.5	ug/L
Prostate Specific Antigen	PSA PSAS	Age: 0-50.....<2.50 51-60.....<3.50 61-70.....<4.50 71-99.....<6.50	ug/L

Testosterone	TEST	<p>Female:</p> <p>1 month – 5 yrs &lt;0.4</p> <p>6 - 9 yrs &lt; 0.7</p> <p>10-11 yrs &lt;0.9</p> <p>12-14 yrs 0.4-1.4</p> <p>15-17 yrs 0.3-1.4</p> <p>&gt; 17 yrs 0.5 – 2.6</p> <p>Male:</p> <p>1 - 5 mos. &lt;6.1</p> <p>6 – 11 mos. &lt;0.4</p> <p>1 – 5 yrs &lt;0.9</p> <p>6 – 9 yrs &lt;1.0</p> <p>10-11 yrs 0.3 – 1.7</p> <p>12 – 14 yrs 0.4 – 19.8</p> <p>15-17 yrs 7.6 – 27.7</p> <p>&gt; 17 yrs 8.4-28.7</p>	nmol/L
Thyroid Stimulating Hormone	TSH	0.10- 5.00	mU/L
Free T3	FT3	3.5 – 6.5	pmol/L
Valproic Acid	VALP	350 - 700	umol/L
Vitamin B12	B12	>150	pmol/L
25 OH VITAMIN D	VitD	75 - 150	nmol/L

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<b><u>MISCELLANEOUS TESTS</u></b>			
A1C May 16, 2011	A1C	<6.5	%
3 month ABG	3mABG	<8.5	mmol/L
Beta HCG (Screen)	BHCGS	negative : <20 positive : >20	mIU/ml
Estimated Glomerular Filtration Rate (eGFR)	FEMC MALC	100 – 120	ml/min
Digoxin	DIG	1.2 - 2.6	nmol/L
Patient Risk Ratio CHOL/HDL	RRI	Male: < 5.2 Female: <4.7	
Lithium	LITH	0.80 - 1.40 November 14, 2011 Report result to 2 decimal places	mmol/L
Phenytoin	PHENY	40 - 80	umol/L
Serum Protein Electrophoresis	SPE ALBE ALPHA1 ALPHA2 BETA GAMMA	Total Protein 60 – 80 Albumin 35.0 – 50.0 Alpha 1 2.0 – 4.0 Alpha 2 5.0 – 8.3 Beta 6.0 – 10.0 Gamma 7.0 – 13.0	g/L



<u>TEST NAME</u>	<u>TEST ABBRV</u>	<u>RANGE</u>	<u>UNITS</u>
<b><u>URINE CHEMISTRY</u></b>			
Urine Creatinine	UR CRE 24	F: >15 yrs      5.0 - 16.0 M: >15 yrs      7.0 – 18.0 For Path. Reference: M/F: < 3yrs      0.071-0.177 3- <10 yrs    0.071-0.194 10- 15 yrs    0.071-0.265	mmol/d  mmol/Kg/day mmol/Kg/day mmol/Kg/day
24h Corrected Creat. Clearance	CCRCL	F: <=50 yrs      1.14 - 2.24 F: > 50 yrs      0.87 – 1.94 M: <= 50 yrs      1.25 - 2.44 M: > 50 yrs      0.92 – 2.10	ml/s
12 Corrected Creat. Clearance	CCRCL	F: <=50 yrs      1.14 - 2.24 F: > 50 yrs      0.87– 1.94 M: <= 50 yrs      1.25 - 2.44 M: > 50 yrs      0.92 – 2.10	ml/s
Urine Urate	UR URAT24	1.5 – 4.4	mmol/d
Urine Calcium	UR CA 24	2.50 – 7.50	mmol/d
Urine Calcium/Creatinine Ratio March 1, 2011	UCa/ Cr Ratio	<0.39	
Urine Phosphate	UR PO4 24	13 – 42	mmol/d
Urine Sodium	UR NA 24	40 – 220	mmol/d
Urine Potassium	UR K 24	25 – 125	mmol/d
Urine Protein/Creatinine Ratio March 1, 2011	UTP/Cr Ratio	<0.023	g/mmol
Urine Protein	UR PROT24	< 0.114	g/d
Urine Urea	UR UREA24	210 – 610	mmol/d
Urine Chloride	UR CL 24	110 – 250	mmol/d
URINE MICROALBUMIN (24 hr)	UR MALB24	<30.0 MICROALBUMINURIA 30-300 NEPHROPATHY > 300	mg/d
URINE ALBUMIN / CREATININE RATIO * (ACR) • reported on random urines ONLY	RUMAL	Male      Female Normal: <2.0      <2.8 Microalbuminuria: 2.0-20.0    2.8-28.0 Nephropathy: >20.0      >28.0	mg/mmol or ug/umol

<u>TEST NAME</u>	<u>TEST ABBRV</u>	<u>RANGE</u>	<u>UNITS</u>
<b>URINE DRUG SCREENS</b>			
URINE ALCOHOL	URALC	Cut-off Level: 20	mg/dl
URINE AMPHETAMINE	URAMP	Cut-off Level: 1000	ng/ml
URINE BARBITURATE	URBAR	Cut-off Level: 200	ng/ml
URINE BENZODIAZEPINE	URBEN	Cut-off Level: 100	ng/ml
URINE CANNABINOIDS	URTHC	Cut-off Level: 50	ng/ml
URINE COCAINE	URCOC	Cut-off Level: 300	ng/ml
URINE METHADONE METABOLITE (EDDP)	URMTH	Cut-off Level: 100	ng/ml
URINE OPIATES	UROP	Cut-off Level: 300	ng/ml
URINE OXYCODONE	UROX	Cut-off Level: 100	ng/ml