Procedure: **Chemistry Adult and Pediatiric Reference Ranges V2.16**	Section: CC0100
Site: Main Laboratory	Manual: Chemistry
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Approved by: Dr.L.Argatoff	Date: November 22,2016

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

TEST NAME	TEST ABBREV.	RANGE	UNITS
ROUTINE CHEMISTRY			
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(HCO3)	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	*≥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	< 5.0	mg/L
Gamma Glutamyl Transferase	GGT	< 55	U/L
High Density Lipoprotein	HDL	F: < 9 yrs >0.98	mmol/L

*not reported if TRIG >20.00		<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	
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 *Note: The LDH methodology changed effective Nov. 3, 2014.* *The new reference values are approximately 50% of the old method reference values.*	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	U/L

		M: 7 – 12 yr <427 F: 13-17 yr <244 M: 13 – 17 yr <382 M/F: > 17 yr <250	
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

TEST NAME	**TEST ABBRV**	**RANGE**	**UNITS**
IMMUNOASSAY CHEMISTRY			
Anti-TPO April 20, 2012	**ATPO**	**<50**	**kIU/L**
BHCG Quant.	BHCGQ	>25 Pregnant 5–25 Consistent with early pregnancy <5 Not pregnant M: <5	IU/L
Cortisol – AM 8 – 10 a.m. Nov. 25, 2011	**CORTA**	**< 16 yrs 83-580** **≥16 yrs 138-690**	**nmol/L**
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: <50…..……..<2.50 50-59……..<3.50 60-69……..<4.50 >70……<6.50	ug/L

Testosterone	TEST	Female: 1 month – 5 yrs <0.4 6 - 9 yrs < 0.7 10-11 yrs <0.9 12-14 yrs 0.4-1.4 15-17 yrs 0.3-1.4 > 17 yrs 0.5 – 2.6 Male: 1 - 5 mos. <6.1 6 – 11 mos. <0.4 1 – 5 yrs <0.9 6 – 9 yrs <1.0 10-11 yrs 0.3 – 1.7 12 – 14 yrs 0.4 – 19.8 15-17 yrs 7.6 – 27.7 > 17 yrs 8.4-28.7	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

References

1. Adult reference intervals derived from Siemens Instructions for use.
2. Adult reference intervals derived from Roche Instructions for use.
3. Pediatric reference intervals have been adopted from BC Women's and Children's Hospital
4.

1.

TEST NAME	**TEST ABBRV**	**RANGE**	**UNITS**
MISCELLANEOUS TESTS			
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 (eGFR) Filtration Rate	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

TEST NAME	**TEST ABBRV**	**RANGE**	**UNITS**
URINE CHEMISTRY			
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 Corrrected 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

TEST NAME	**TEST ABBRV**	**RANGE**	**UNITS**
URINE DRUG SCREENS			
URINE ALCOHOL	URALC	Cut-off Level: 20	mg/dl
URINE AMPHETAMINE	URAMP	Cut-off Level: 1000	ng/ml
URINE BENZODIAZEPINE	URBEN	Cut-off Level: 200	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