

Cavan General Hospital Department of Clinical & Laboratory Sciences			
Q-Pulse Doc No:	MEMO231	Date of Issue	19/09/2022
Reference Range Adjustment			

MEMORANDUM

Originating Department Pathology Laboratory
Issued By: Brian O'Malley, Laboratory Manager
Issued To: All Users
Subject: Reference Range Adjustment

Details:

Dear Colleagues,

As a result of our instrumentation upgrade earlier this year we have reviewed all assay reference ranges. There have been small changes to some assay ranges and these have now been amended on all reporting platforms.

Further detail on ranges are available in the Laboratory User Manual and by contacting the Biochemistry lab directly on ext 6297/6298.

BIOCHEMISTRY ASSAY INFORMATION

Reference to Associated Procedure: LP-BIO-0010

Analyte	Method	Reference Range	Units	Source	Telephone limits	Autovalidation on Range
Albumin	BCG	0 – 4 days 28 – 44 4d – 14y 38 - 54 Adult 14- 59y 35 – 50 60 – 90y 32 - 46 90+y 29 - 45	g/L	Abbott	<20 (paeds only)	All >21

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Analyte	Method	Reference Range	Units	Source	Telephone limits	Autovalidation Range
Alk Phosphatase	PNP hydrolysis	0 -14d 70 -380 14d-16 years 60 -425 Adult 30 - 130	IU/L	Pathology Harmony	N/A	All <1001
Alpha Fetoprotein	CMIA Immunoassay	0.75 – 7.4	IU/ml	Abbott	N/A	All
Direct bilirubin	Diazo sulphanic acid	0 – 8.6	µmol/L	Abbott	N/A	All
ALT	NADH (w/o PP)	0 - 55	IU/L	Abbott	>825 (GP only)	All <601
Amikacin	Petinia	4 - 8	mg/l	Abbott	N/A	All
Amylase	CNPG3 substrate	28 - 100	IU/L	Abbott	>250	All <251
AST	NADH (w/o PP)	5 - 34	IU/L	Abbott	>510 (GP only)	All <601
NT Pro BNP	CMIA Immunoassay	<75y < 125 >75y <450	pg/ml	Abbott	N/A	All
CA125	CMIA Immunoassay	0 - 35	IU/ml	Abbott	N/A	All
CA15-3	CMIA Immunoassay	0 - 31	IU/ml	Abbott	N/A	All
CA19-9	CMIA Immunoassay	0 - 37	IU/ml	Abbott	N/A	All
Calcium Total	Arsenazo III	0 -10d 1.9 – 2.6 10d – 2y 2.25 – 2.75 2y – 12y 2.20 – 2.7 Adult 2.1 – 2.55	mmol/L	Abbott	<1.8 & >2.85	All between 1.8 – 2.6
Calcium Adjusted	Calculation	2.2 – 2.6	mmol.L	Source of evidence Path Harmonisation	<1.8 & >2.85	N/A
CEA	CMIA Immunoassay	0 - 5	ug/L	Abbott	N/A	All

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Chloride	Indirect ISE	98 - 107	mmol/L	Abbott	N/A	All between 85 - 128
Cholesterol	Cholesterol esterase	0 - 5	mmol/L	ESC guide 2019	N/A	All between 2.5 – 10.0
Creatine Kinase	NAC	Male 30 – 200 Female 29 - 168	IU/L	Abbott	>5000 (GP only)	All below 501
Creatinine.	Enzymatic	< 2 wk 27- 81 2 wk–5 yr 14 – 37 5 – 9 yr 25 – 48 9 – 15y 30- 72 Adult Male 64- 104 Female 49- 90	umol/L	Abbott	>400 (GP Only)	All below 501
Creatinine Clearance	Calculation	80 - 120	ml/min		N/A	N/A
CRP	Immunoturbidimetry	<5	mg/l	Abbott	>300 (GP only)	All below 351
CSF Glucose	Hexokinase	<16y 3.3 – 4.5 >16y 2.2 – 3.9 Interpret with regard to plasma glucose.	mmol/l			All
Ethanol	Alcohol dH		mg/dl	N/A	>300	All
Ferritin	CMIA Immunoassay	Male 22-275 Female 5-205	ug/l	Abbott	N/A	All
Folic Acid	CMIA Immunoassay	7.0 – 46.4	nmol/l	Abbott	N/A	All
Free PSA	CMIA Immunoassay	None	ug/l		N/A	All
Free T3	CMIA Immunoassay	2.42 – 6.00	pmol/l	Abbott	>10	All below 10
Free T4	CMIA Immunoassay	9.0 – 19.0	pmol/l	Abbott	<8 & >40	All between 8 - 40

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FSH	CMIA Immunoassay	Follicular 3.0 – 8.1 Mid cycle 2.5 – 16.7 Luteal 1.4 – 5.5 Male 0.95 – 11.95	IU/l	Abbott	N/A	All
Gamma GT	Carboxy-nitroanillide	Male 0 - 55 Female 0 - 38	IU/L	Abbott	N/A	All
Gentamicin	Petinia	<1 (Trough)	mg/l	BNF	N/A	All below 5.1
Glucose (fasting)	Hexokinase G6PdH	3.9 – 5.6	mmol/L	WHO	<2.5 & >20 <2.5 & >20 GP	All between 2.5 – 20.0
Glucose (post prandial)	Hexokinase G6PdH	3.9 – 7.8	mmol/L	WHO	<2.5 & >20 <2.5 & >20 GP	All between 2.5 – 20.0
HbA1C	HPLC	<42		National	N/A	All
HCG	CMIA Immunoassay	0 – 5.0	IU/l	Abbott	N/A	All
HDL-Cholesterol	Direct measurement CE/CO	>1.0	mmol/l	ESC guide 2019	N/A	All
Iron	Ferene	Male 11-31 Female 9-30	µmol/L	Abbott	>60	All below 60.0
LDH	L → P IFCC	125 - 220	u/l	Abbott	N/A	All below 751
LDL-Cholesterol	Cholesterol esterase	<3.0	mmol/l	ESC guide 2019	N/A	All
LH	CMIA Immunoassay	Follicular 1.8 – 11.8 Midcycle 7.6 – 89.1 Luteal 0.6 – 14.0 Male 0.6 – 12.1	pmol/l	Abbott	N/A	All

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Lithium	Colourimetric	0.5 – 1.0	mmol/L	Nolen et al. 2019	>1.2 >1.5 GP	All below 1.2
Magnesium	Isocitrate dH	0.7 – 1.0	mmol/L	Pathology Harmony	<0.5 & >1.8	All between 0.6 – 1.8
Micro Protein CSF	Benzethonium Chloride	0 – 1mt 0.2 – 0.8 Thereafter 0.15 – 0.45	g/l	Abbott		All
Micro Protein Urine	Benzethonium Chloride	0.000– 0.14 0.3	g/l g/24h	Abbott	N/A	All
Microalbumin	Immunoturbidimetry	0 - 30	mg/l	Abbott	N/A	All
Non HDL cholesterol	Calculation	<3.4	mmol/L	ESC guide 2019		N/A
Oestradiol	CMIA Immunoassay	Follicular 77 - 921 Mid cycle 139 - 2381 Luteal 77 – 1140 Male 40 - 161	pmol/l	Abbott	N/A	All
Osmolality serum	Depression of freezing point	275 - 300	mOsm/Kg			All
Osmolality urine	Depression of freezing point	300 - 900	mOsm/Kg			All
Paracetamol	Acyl Aminohydrolase	Interpret with NPIS nomogram	mg/L	Irish Medicines Board, 2021	>50	All below 50.1
Phosphate	Phosphomolybdate	0.8 – 1.5	mmol/L	Pathology Harmony	<0.3 & >4.5	
Potassium	Indirect ISE	0 – 14 d 3.4 – 6.0 15d – 1y 3.5 – 5.7 1y – 16y 3.5 – 5.0 Adult 3.5 – 5.3	mmol/L	Pathology Harmony	>6 In house >6.3 GP	All between 2.51 – 5.9
Procalcitonin	CMIA Immunoassay	0 – 0.25	ug/l	Abbott		All

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Progesterone	CMIA Immunoassay	Luteal 4 – 50	nmol/l	Abbott	N/A	All
Protein/Creatinine Ratio	Calculation		Mg/mmol		N/A	N/A
PSA(Total)	CMIA Immunoassay	<49 y <2 50 – 59y <3 60 – 69 <4 >70 y <5	µg/l	National Guideline	N/A	All
PSA Ratio	Calculation		None		N/A	N/A
Rheumatoid Factor	Immunoturbidimetry	<30	IU/ml	Abbott	N/A	All
Salicylate	Salicylate dH	150 - 300	mg/L	Abbott		All below 250
Sodium	Indirect ISE	133 - 146	mmol/L	Pathology Harmony	<120 & >155 <120 & >155 GP	All between 120 - 155
Sweat chloride	Ag/AgCl		mmol/L	ACB	N/A	N/A
Tobramycin	Petinia	<2	mg/l	BNF	N/A	All
Total Bilirubin	Diazonium salt	0– 7 day 0-171 Adult 3 -21	µmol/L	Abbott	>300	All below 301
Total Protein	Biuret	60-80	g/L	Pathology Harmony	>120	All below 96

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Transferrin	Turbidimetry	0 – 14 y Male 1.86 – 3.88 Female 1.80 – 3.91 15 – 60y Male 1.74 – 3.64 Female 1.80 - 3.82 61 – 120yr Male 1.63 – 3.44 Female 1.73 – 3.60	g/L	Abbott	N/A	All																				
Transferrin Saturation%	Calculation	<table border="1"> <tr> <td></td> <td>Male</td> <td>Female</td> <td>%</td> </tr> <tr> <td><1 year</td> <td>4.1 - 59</td> <td></td> <td></td> </tr> <tr> <td>1 – 14y</td> <td>6.5 - 39</td> <td></td> <td></td> </tr> <tr> <td>14 – 19y</td> <td>9.6 - 58</td> <td>5.2 - 44</td> <td></td> </tr> <tr> <td>>19y</td> <td>19 - 55</td> <td>10 - 50</td> <td></td> </tr> </table>		Male	Female	%	<1 year	4.1 - 59			1 – 14y	6.5 - 39			14 – 19y	9.6 - 58	5.2 - 44		>19y	19 - 55	10 - 50			CALIPER & NMGC (adult)	N/A	All
	Male	Female	%																							
<1 year	4.1 - 59																									
1 – 14y	6.5 - 39																									
14 – 19y	9.6 - 58	5.2 - 44																								
>19y	19 - 55	10 - 50																								
Triglyceride	GK/GPO	0 -1.7	mmol/L	ESC guide 2019	>10	All below 10.1																				
Troponin	CMIA Immunoassay	Male 0 – 34 Female 0 - 16	nmol/L	Abbott	M >34 F >16	All below 16																				
TSH	CMIA Immunoassay	0.35 – 4.94	mIU/L	Abbott	>30	All below 30																				
Urate	Uricase/POD	210 – 430 (M) 140 – 360 (F)	μmol/L	Abbott	>400 (obs)	All below 401																				

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Urea	Urease / GLdH Kinetic	0 -14d 0.8 – 5.5 15d – 1y 1.0 – 5.5 2y – 16y 2.5 – 6.5 Adult 2.5 – 7.8	mmol/L	Pathology Harmony	>30 (GP only)	All between 2.0 – 50.0
Urinary Calcium	Arsenazo III	2.5 – 7.5 (24h)	mmol/day	Abbott	N/A	All
Urinary Creatinine	Enzymatic	M: 5100-14200 F: 3900-9400	µmol/L	Abbott	N/A	All
Urinary Potassium	Indirect ISE	25 – 125 Interpret relative to intake/serum	mmol/L	Abbott	N/A	All
Urinary Protein 24 h	Benzethonium Chloride	<0.3	g/24H	Abbott	N/A	N/A
Urinary Sodium	Indirect ISE	40 – 220 Interpret relative to intake/serum	mmol/L	Abbott	N/A	N/A
Urinary Urate	Uricase	1500– 4500 (24h) (Normal diet)	µmol/day	Pathology Harmony	N/A	All
Urate/Creatinine Ratio	Calculation	0 – 6 w 0.2 – 3.0 6w– 2y 0.2 – 2 2 – 6y 0.2 – 1.5 6 – 14y 0.2 – 1.0 Adult 0.15 – 0.6	mmol/mmol	Vademecum Metabolicum	N/A	N/A
Vancomycin	Petinia	<15 (Trough)	mg/l	BNF	N/A	All
Vit.B12	CMIA Immunoassay	139 - 651	pmol/l	Abbott	<120	All above 121

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Vitamin D	CMIA Immunoassay (Recommended threshold)	>50	nmol/l	Natl. Osteoporosis Society	N/A	All
ACR	Calculation	< 2.5 male < 3.5 female	mg/L	Abbott	N/A	N/A

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