URINE METABOLIC SCREEN REFERENCE INTERVALS

CHEMISTRY

Analyte*	Reference	Analysis
Glucose	negative	Ketostix
Ketones	negative	Ketostix
Reducing substances	negative	Clinitest
Sugar chromatography	not indicated	**Thin layer chromatography

* Semi-quantitative results

** TLC only done if positive reducing substances

CREATINE

	age <4 reference interval limit umol/L		age 4-13 reference interval limit umol/L		age >13 reference interval limit umol/L		unspecified age reference interval limit umol/L	
Analyte	**lower**	**upper**	**lower**	**upper**	**lower**	**upper**	**lower**	**upper**
Creatinine	304	7690	1392	15520	1823	25560	596	19107
Creatine	9	6621	27	5591	14	2522	14	5198

	age <4 reference interval limit mmol/mol		age 4-13 reference interval limit mmol/mol		age >13 reference interval limit mmol/mol		unspecified age reference interval limit mmol/mol	
Analyte	**lower**	**upper**	**lower**	**upper**	**lower**	**upper**	**lower**	**upper**
Creatine / creatinine	11	1830	6	1171	4	320	4	1301

Analysis by Liquid chromatography - Tandem mass spectrometry

*Note **age categories** are different for creatine and creatinine versus all other quantitative analytes

CRYSTALURIA

		age <2 reference interval limit umol/L		age 2-18 reference interval limit umol/L		age >18 reference interval limit umol/L		unspecified age reference interval limit umol/L	
Analyte		**lower**	**upper**	**lower**	**upper**	**lower**	**upper**	**lower**	**upper**
Cystine	*	4	82	5	117	7	182	6	134
Orotic acid	**	0.3	5.6	0.4	7.1	0.6	9.5	0.4	7.9
Uric acid	**	512	1428	554	1444	624	1505	577	1458
Xanthine	**	7	104	15	140	8	136	9	138

*Analysis by Ultra performance liquid chromatography (UPLC)

**Analysis by Liquid chromatography - Tandem mass spectrometry

AMINO ACID

Analyte	age <2 reference interval limit mmol/mol lower	upper	age 2-18 reference interval limit mmol/mol lower	upper	age >18 reference interval limit mmol/mol lower	upper	unspecified age reference interval limit mmol/mol lower	upper
1-methyl-histidine / Cr	27	131	22	105	18	62	20	99
3-methyl-histidine / Cr	3	197	0	289	1	262	0	266
Alpha-aminoadipic acid / Cr	13	118	4	45	2	12	2	62
Alpha-aminobutyric acid / Cr	1	12	0	9	0	6	0	10
Alanine / Cr	26	173	15	113	9	68	12	132
Alloisoleucine / Cr	0	1	0	0	0	0	0	0
Anserine / Cr	0	136	0	83	0	29	0	84
Arginine / Cr	0	15	0	11	0	6	0	13
Asparagine / Cr	14	87	6	51	3	38	4	53
Aspartic acid / Cr	0	13	0	8	0	7	0	10
Beta-alanine / Cr	0	29	0	21	0	17	0	20
Beta-aminoisobutyric acid / Cr	12	212	4	152	2	117	2	158
Carnosine / Cr	2	140	1	54	0	15	0	79
Citrulline / Cr	0	15	0	7	0	4	0	8
Cystathionine / Cr	1	21	0	9	0	8	0	12
Cystine / Cr	4	28	2	16	2	22	2	21
Ethanolamine / Cr	44	223	27	131	17	82	18	141
Gamma-aminobutyric acid / Cr	0	17	0	15	0	9	0	15
Glutamic acid / Cr	4	44	2	22	2	16	2	28
Glutamine / Cr	64	291	31	203	13	101	17	232
Glycine / Cr	72	761	68	584	26	437	40	558
Histidine / Cr	68	442	27	317	15	181	16	328
Homocystine / Cr	0	1	0	0	0	0	0	0
Hydroxylysine / Cr	2	23	1	11	0	7	0	14
Hydroxyproline / Cr	0	252	0	7	0	6	0	66
Isoleucine / Cr	0	10	0	5	0	3	0	6
Leucine / Cr	2	20	2	11	0	7	0	14
Lysine / Cr	7	83	4	61	2	67	2	69
Methionine / Cr	1	10	1	6	0	5	0	7
Ornithine / Cr	2	12	1	10	0	9	0	10
Phenylalanine / Cr	5	39	3	21	2	13	2	24
Phosphoethanolamine / Cr	0	39	0	20	0	8	0	26
Phosphoserine / Cr	0	9	0	11	0	6	0	10
Proline / Cr	1	138	0	28	0	12	0	51
Sarcosine / Cr	0	19	0	18	0	21	0	20
Serine / Cr	33	300	20	124	3	67	7	173
Taurine / Cr	14	758	7	355	3	219	4	439
Threonine / Cr	16	100	8	59	2	44	4	64
Tryptophan / Cr	4	34	3	22	2	12	2	24
Tyrosine / Cr	6	58	4	42	1	25	1	42
Valine / Cr	4	29	3	16	1	10	1	21

Analysis by Ultra performance liquid chromatography (UPLC)

PURINES

Analyte	age <2 reference interval limit mmol/mol lower	upper	age 2-18 reference interval limit mmol/mol lower	upper	age >18 reference interval limit mmol/mol lower	upper	unspecified age reference interval limit mmol/mol lower	upper
Adenine / Cr	0.3	8.4	0.1	2.4	0.1	4.8	0.1	4.0
Adenosine / Cr	0.0	2.5	0.0	1.6	0.0	0.8	0.0	1.8
Adenylosuccinic acid / Cr	0.00	0.42	0.00	0.72	0.00	0.48	0.00	0.54
Deoxyadenosine / Cr	0.00	0.09	0.00	0.04	0.00	0.03	0.00	0.05
Deoxyguanosine / Cr	0.00	0.16	0.00	0.02	0.00	0.01	0.00	0.06
Deoxyinosine / Cr	0.01	0.69	0.00	0.08	0.00	0.03	0.00	0.27
Guanine / Cr	0.0	2.2	0.0	1.4	0.0	0.7	0.0	1.6
Guanosine / Cr	0.1	1.3	0.0	0.3	0.0	0.2	0.0	0.7
Hypoxanthine / Cr	3	54	2	32	1	16	1	38
Inosine / Cr	0.4	5.1	0.1	1.7	0.0	0.9	0.1	2.6
Succinyladenosine / Cr	0.17	0.88	0.07	0.59	0.01	0.24	0.05	0.70
Uric Acid / Cr	161	2171	57	912	51	483	55	1352
Xanthine / Cr	5	63	2	40	2	22	2	48

Analysis by Liquid chromatography - Tandem mass spectrometry

PYRIMIDINES

Analyte	age <2 reference interval limit mmol/mol lower	upper	age 2-18 reference interval limit mmol/mol lower	upper	age >18 reference interval limit mmol/mol lower	upper	unspecified age reference interval limit mmol/mol lower	upper
5-hydroxymethyl-uracil / Cr	5	25	1	13	1	6	1	17
Dihydroorotic acid / Cr	0.00	0.36	0.00	0.21	0.00	0.17	0.00	0.29
Dihydrothymine / Cr	0	43	0	6	0	4	0	16
N-carbamyl-beta-alanine / Cr	2	26	1	7	0	5	1	17
Orotic acid / Cr	0.2	5.6	0.1	2.0	0.1	1.4	0.1	3.1
Pseudouridine / Cr	45	257	15	96	9	55	11	198
Thymidine / Cr	0.03	0.79	0.01	0.31	0.00	0.17	0.01	0.42
Thymine / Cr	0.0	1.5	0.1	0.8	0.0	0.4	0.0	0.9
Uracil / Cr	0	35	1	28	0	11	0	26
Uridine / Cr	0.2	3.5	0.0	1.0	0.0	0.7	0.0	1.6

Analysis by Liquid chromatography - Tandem mass spectrometry