

## Non-Abbott Test Comparison: Chemistry Tests

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Albumin BCG	3.5 - 5.5 g/dL	<table border="1"> <thead> <tr> <th colspan="3">Serum<sup>7</sup>/Plasma</th> </tr> <tr> <th></th> <th>Range (g/dL)</th> <th>Range (g/L)</th> </tr> </thead> <tbody> <tr> <td>0 to 4 days</td> <td>2.8 to 4.4</td> <td>28 to 44</td> </tr> <tr> <td>4 days to 14 years</td> <td>3.8 to 5.4</td> <td>38 to 54</td> </tr> <tr> <td>14 to 18 years</td> <td>3.2 to 4.5</td> <td>32 to 45</td> </tr> <tr> <td>20 to 60 years</td> <td>3.5 to 5.2</td> <td>35 to 52</td> </tr> <tr> <td>60 to 90 years</td> <td>3.2 to 4.6</td> <td>32 to 46</td> </tr> <tr> <td>&gt; 90 years</td> <td>2.9 to 4.5</td> <td>29 to 45</td> </tr> </tbody> </table>	Serum <sup>7</sup> /Plasma				Range (g/dL)	Range (g/L)	0 to 4 days	2.8 to 4.4	28 to 44	4 days to 14 years	3.8 to 5.4	38 to 54	14 to 18 years	3.2 to 4.5	32 to 45	20 to 60 years	3.5 to 5.2	35 to 52	60 to 90 years	3.2 to 4.6	32 to 46	> 90 years	2.9 to 4.5	29 to 45	0.99	-1.43%	1.01	-0.08																																						
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AST	0 - 35 U/L	5 - 34 U/L	1.00	0.90%	1.00	1.60																																																														
Bilirubin, Direct	< 0.4 mg/dL	0.0 - 0.5 mg/dL	0.99	1.42%	0.97	0.16																																																														
Bilirubin, Total	0.1 - 1.2 mg/dL	0-6 days: Refer to <a href="http://www.bilitool.org">www.bilitool.org</a> for information on age-specific (postnatal hour of life) serum bilirubin values.  7-14 days: <15.0 mg/dL 15 days to 17 years: ≤1.0 mg/dL ≥18 years: ≤1.2 mg/ dL	1.00	0.63%	1.01	-0.02																																																														

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Calcium	1.1 Urine: 100–321 mg/24h (corresponding to 6.8-21.3 mg/dL) 1.2 Blood a. Males 1-14 years: 9.6-10.6 mg/dL 15-16 years: 9.5-10.5 mg/dL 17-18 years: 9.5-10.4 mg/dL 19-21 years: 9.3-10.3 mg/dL ≥ 22 years: 8.9-10.1 mg/dL Reference values have not been established for patients who are <12 months of age. b. Females 1-11 years: 9.6-10.6 mg/dL 12-14 years: 9.5-10.4 mg/dL 15-18 years: 9.1-10.3 mg/dL ≥ 19 years: 8.9-10.1 mg/dL Reference values have not been established for patients who are <12 months of age.	Serum/Plasma <sup>10</sup> <table border="1"> <thead> <tr> <th></th> <th>Range (mg/dL)</th> <th>Range (mmol/L)</th> </tr> </thead> <tbody> <tr> <td>Cord</td> <td>8.2 to 11.2</td> <td>2.06 to 2.80</td> </tr> <tr> <td>Newborn</td> <td></td> <td></td> </tr> <tr> <td>  Premature</td> <td>6.2 to 11.0</td> <td>1.55 to 2.75</td> </tr> <tr> <td>  0 to 10 days</td> <td>7.6 to 10.4</td> <td>1.90 to 2.60</td> </tr> <tr> <td>  10 days to 24 months</td> <td>9.0 to 11.0</td> <td>2.25 to 2.75</td> </tr> <tr> <td>Child, 2 to 12 years</td> <td>8.8 to 10.8</td> <td>2.20 to 2.70</td> </tr> <tr> <td>Adult</td> <td>8.4 to 10.2</td> <td>2.10 to 2.58</td> </tr> <tr> <td>Male &gt; 60 years</td> <td>8.8 to 10.0</td> <td>2.20 to 2.60</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th></th> <th>Range (mg/day)</th> <th>Range (mmol/day)</th> </tr> </thead> <tbody> <tr> <td>Calcium in diet</td> <td>5 to 40</td> <td>0.13 to 1.00</td> </tr> <tr> <td>Low to average</td> <td>50 to 150</td> <td>1.26 to 3.75</td> </tr> <tr> <td>Average (800 mg/day or 20 mmol/day)</td> <td>100 to 300</td> <td>2.50 to 7.50</td> </tr> </tbody> </table>		Range (mg/dL)	Range (mmol/L)	Cord	8.2 to 11.2	2.06 to 2.80	Newborn			Premature	6.2 to 11.0	1.55 to 2.75	0 to 10 days	7.6 to 10.4	1.90 to 2.60	10 days to 24 months	9.0 to 11.0	2.25 to 2.75	Child, 2 to 12 years	8.8 to 10.8	2.20 to 2.70	Adult	8.4 to 10.2	2.10 to 2.58	Male > 60 years	8.8 to 10.0	2.20 to 2.60		Range (mg/day)	Range (mmol/day)	Calcium in diet	5 to 40	0.13 to 1.00	Low to average	50 to 150	1.26 to 3.75	Average (800 mg/day or 20 mmol/day)	100 to 300	2.50 to 7.50	0.99	-1.42	0.99	-0.06
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Cholesterol	Desirable less than 200 mg/dL Borderline-high 200-239 mg/dL High greater than 240 mg/dL	Desirable <200 mg/dL Borderline 170 - 199 mg/dL High ≥ 240 mg/dL	1.00	1.60%	1.04	-4.30																																							
Creatine Kinase	Male: < 171 U/L    Female: < 145 U/L	Male: 30 - 200 U/L Female: 29 - 168 U/L	1.00	5.50%	1.08	-4.60																																							
Carbon Dioxide	Adults: 23 - 31 mmol/L	Adult: 22 - 31 mmol/L	1.00	-6.70%	1.08	-3.10																																							
Creatinine	Serum and Plasma a. Male 1-2 years: 0.1-0.4mg/dL 3-4 years: 0.1-0.5 mg/dL 5-9 years: 0.2-0.6 mg/dL 10-11 years: 0.3-0.7 mg/dL 12-13 years: 0.4-0.8 mg/dL 14-15 years: 0.5-0.9 mg/dL > or =16 years: 0.8-1.3 mg/dL Female 1-3 years: 0.1-0.4 mg/dL 4-5 years: 0.2-0.5 mg/dL 6-8 years: 0.3-0.6 mg/dL 9-15 years: 0.4-0.7 mg/dL > or =16 years: 0.6-1.1 mg/dL Reference values have not been established for patients who are less than 12 months of age. Urine: 1 – 2 g/24h TV Abdominal fluid: No reference range established	Serum/Plasma <table border="1"> <thead> <tr> <th></th> <th>Range (mg/dL)</th> <th>Range (μmol/L)</th> </tr> </thead> <tbody> <tr> <td>Adult, Male</td> <td>0.72 to 1.26</td> <td>63.6 to 110.5</td> </tr> <tr> <td>Adult, Female</td> <td>0.57 to 1.11</td> <td>50.4 to 96.1</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th></th> <th>Adult Male</th> <th>Adult Female</th> </tr> </thead> <tbody> <tr> <td>Concentration<sup>11</sup></td> <td>63 to 166 mg/dL (5.6 to 14.7 mmol/L)</td> <td>47 to 110 mg/dL (4.2 to 9.7 mmol/L)</td> </tr> <tr> <td>Range</td> <td>12.1 to 28.9 mg/kg/day (107 to 256 μmol/kg/day)</td> <td>10.7 to 26.0 mg/kg/day (95 to 230 μmol/kg/day)</td> </tr> <tr> <td>24 Hour Excretion<sup>12</sup></td> <td>950 to 2,460 mg/day (8.4 to 22.0 mmol/day)</td> <td>710 to 1,650 mg/day (6.3 to 14.6 mmol/day)</td> </tr> <tr> <td>Creatinine Clearance<sup>13</sup></td> <td>Adult Male: 66 to 163 mL/min/1.73 m<sup>2</sup> BSA (1.10 to 2.72 mL/sec/1.73 m<sup>2</sup> BSA)</td> <td>Adult Female: 66 to 165 mL/min/1.73 m<sup>2</sup> BSA (1.10 to 2.76 mL/sec/1.73 m<sup>2</sup> BSA)</td> </tr> </tbody> </table>		Range (mg/dL)	Range (μmol/L)	Adult, Male	0.72 to 1.26	63.6 to 110.5	Adult, Female	0.57 to 1.11	50.4 to 96.1		Adult Male	Adult Female	Concentration <sup>11</sup>	63 to 166 mg/dL (5.6 to 14.7 mmol/L)	47 to 110 mg/dL (4.2 to 9.7 mmol/L)	Range	12.1 to 28.9 mg/kg/day (107 to 256 μmol/kg/day)	10.7 to 26.0 mg/kg/day (95 to 230 μmol/kg/day)	24 Hour Excretion <sup>12</sup>	950 to 2,460 mg/day (8.4 to 22.0 mmol/day)	710 to 1,650 mg/day (6.3 to 14.6 mmol/day)	Creatinine Clearance <sup>13</sup>	Adult Male: 66 to 163 mL/min/1.73 m <sup>2</sup> BSA (1.10 to 2.72 mL/sec/1.73 m <sup>2</sup> BSA)	Adult Female: 66 to 165 mL/min/1.73 m <sup>2</sup> BSA (1.10 to 2.76 mL/sec/1.73 m <sup>2</sup> BSA)	1.00	2.84%	1.03	-0.01															
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CRP	< 5 mg/L	< 5 mg/L	Method comparison in progress																																										
HSCRp	ADDED THIS ROW	Low risk < 1.0 mg/L Average risk = 1.0 to 3.0 mg/L High risk > 3.0 mg/L If >10.0 mg/L consider evaluating further for non-cardiovascular causes of inflammation	Method comparison in progress																																										
GGT	<57 U/L	Female: 9-36 U/L    Male: 12-64 U/L	1.00	11.40%	1.09	2.9																																							

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<b>Glucose</b>	<b>Serum/Plasma</b> - Fasting: 70 - 99 mg/dL Random: 70 - 140 mg/dL <b>Urine:</b> <500 mg/24h TV <b>CSF:</b> 45 - 80 mg/dL	<b>Reference Range</b> The American Diabetes Association recommends use of a fasting glucose concentration of 99 mg/dL (5.5 mmol/L) as the upper limit of "normal". <sup>10,11</sup> Population reference ranges in various texts and publications may differ. <b>Serum/Plasma</b> <sup>12</sup> <table border="1" style="font-size: small;"> <thead> <tr> <th>Fasting</th> <th>Range (mg/dL)</th> <th>Range (mmol/L)</th> </tr> </thead> <tbody> <tr><td>Cord</td><td>45 to 96</td><td>2.50 to 5.33</td></tr> <tr><td>Premature</td><td>20 to 60</td><td>1.11 to 3.33</td></tr> <tr><td>Neonate</td><td>30 to 60</td><td>1.67 to 3.33</td></tr> <tr><td>Newborn, 1 day</td><td>40 to 60</td><td>2.22 to 3.33</td></tr> <tr><td>Newborn, &gt; 1 day</td><td>50 to 80</td><td>2.78 to 4.44</td></tr> <tr><td>Child</td><td>60 to 100</td><td>3.33 to 5.55</td></tr> <tr><td>Adult</td><td>70 to 105</td><td>3.89 to 5.83</td></tr> <tr><td>&gt; 60 years</td><td>80 to 115</td><td>4.44 to 6.38</td></tr> <tr><td>&gt; 70 years</td><td>83 to 110</td><td>4.61 to 6.10</td></tr> </tbody> </table> <b>Urine</b> <sup>12</sup> <table border="1" style="font-size: small;"> <thead> <tr> <th></th> <th>Range</th> <th>Range</th> </tr> </thead> <tbody> <tr> <td>Random</td> <td>1 to 15 mg/dL</td> <td>0.1 to 0.8 mmol/L</td> </tr> <tr> <td>24 hour</td> <td>&lt; 0.5 g/day</td> <td>&lt; 2.8 mmol/day</td> </tr> </tbody> </table> <b>Cerebrospinal Fluid</b> <sup>12</sup> <table border="1" style="font-size: small;"> <thead> <tr> <th></th> <th>Range (mg/dL)</th> <th>Range (mmol/L)</th> </tr> </thead> <tbody> <tr><td>Infant, Child</td><td>60 to 80</td><td>3.33 to 4.44</td></tr> <tr><td>Adult</td><td>40 to 70</td><td>2.22 to 3.89</td></tr> </tbody> </table>	Fasting	Range (mg/dL)	Range (mmol/L)	Cord	45 to 96	2.50 to 5.33	Premature	20 to 60	1.11 to 3.33	Neonate	30 to 60	1.67 to 3.33	Newborn, 1 day	40 to 60	2.22 to 3.33	Newborn, > 1 day	50 to 80	2.78 to 4.44	Child	60 to 100	3.33 to 5.55	Adult	70 to 105	3.89 to 5.83	> 60 years	80 to 115	4.44 to 6.38	> 70 years	83 to 110	4.61 to 6.10		Range	Range	Random	1 to 15 mg/dL	0.1 to 0.8 mmol/L	24 hour	< 0.5 g/day	< 2.8 mmol/day		Range (mg/dL)	Range (mmol/L)	Infant, Child	60 to 80	3.33 to 4.44	Adult	40 to 70	2.22 to 3.89	1.00	-0.20%	1.03	-4.00
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Infant, Child	60 to 80	3.33 to 4.44																																																				
Adult	40 to 70	2.22 to 3.89																																																				
<b>HDL</b>	> 39 mg/dL	Major risk factor for heart disease: <40 mg/dL  Negative risk factor for heart disease: ≥60 mg/dL	0.99	-5.50%	0.99	-2.50																																																
<b>Iron</b>	30 - 160 µg/dL	Female: 60 - 170 µg/dL Male: 65 - 175 µg/dL	Method comparison in progress																																																			
<b>UIBC</b>	No range; Not reported	Female: 70 - 310 µg/dL Male: 69 - 240 µg/dL	Method comparison in progress																																																			
<b>ICT Chloride</b>	Blood: 96-108 mmol/L Urine (24h): 110-250 mmol/24h	Blood Chloride: 98 - 107 mmol/L Urine: 110 - 250 mmol/L	0.98	6.60%	0.92	15.30																																																
<b>ICT Potassium</b>	Blood: 3.5 - 5.0 mmol/L Urine (24h): 25-125 mmol/24h	<table border="1" style="font-size: small;"> <thead> <tr> <th>Serum/Plasma</th> <th>Range (mmol/L)</th> </tr> </thead> <tbody> <tr><td>Potassium</td><td></td></tr> <tr><td>Premature, Cord</td><td>5.0 to 10.2</td></tr> <tr><td>Premature, 48 hours</td><td>3.0 to 6.0</td></tr> <tr><td>Newborn, Cord</td><td>6.8 to 12.0</td></tr> <tr><td>Newborn</td><td>3.7 to 5.9</td></tr> <tr><td>Infant</td><td>4.1 to 5.3</td></tr> <tr><td>Child</td><td>3.9 to 4.7</td></tr> <tr><td>Thereafter</td><td>3.5 to 5.1</td></tr> <tr><td>Plasma, Male</td><td>3.6 to 4.6</td></tr> <tr><td>Plasma, Female</td><td>3.4 to 4.4</td></tr> </tbody> </table> <table border="1" style="font-size: small;"> <thead> <tr> <th>Urine</th> <th>Range (mmol/day)</th> </tr> </thead> <tbody> <tr><td>Potassium</td><td></td></tr> <tr><td>General</td><td>25 to 125</td></tr> <tr><td>Varies with diet.</td><td></td></tr> </tbody> </table>	Serum/Plasma	Range (mmol/L)	Potassium		Premature, Cord	5.0 to 10.2	Premature, 48 hours	3.0 to 6.0	Newborn, Cord	6.8 to 12.0	Newborn	3.7 to 5.9	Infant	4.1 to 5.3	Child	3.9 to 4.7	Thereafter	3.5 to 5.1	Plasma, Male	3.6 to 4.6	Plasma, Female	3.4 to 4.4	Urine	Range (mmol/day)	Potassium		General	25 to 125	Varies with diet.		1.00	-0.91%	0.97	0.10																		
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## Non-Abbott Test Comparison: Chemistry Tests

\*Reference Range chosen for the assay is highlighted in yellow.

Analyte	Current Reference Range*	Abbott Reference Range*	Corr Coef ( R )	Bias	Slope	Y-Intercept																																							
Urea Nitrogen	Serum/Plasma: 5 - 25 mg/dL Urine: 12 - 24 g/TV	<p><b>Reference Range Serum/Plasma<sup>9</sup></b></p> <table border="1"> <thead> <tr> <th>Age</th> <th>Urea Nitrogen Range (mg/dL)</th> <th>Urea Range (mmol/L)</th> </tr> </thead> <tbody> <tr> <td>Children</td> <td></td> <td></td> </tr> <tr> <td>1 to 3 years</td> <td>5.1 to 16.8</td> <td>1.8 to 6.0</td> </tr> <tr> <td>4 to 13 years</td> <td>7.0 to 16.8</td> <td>2.5 to 6.0</td> </tr> <tr> <td>14 to 19 years</td> <td>8.4 to 21.0</td> <td>3.0 to 7.5</td> </tr> <tr> <td>Adult, Male</td> <td></td> <td></td> </tr> <tr> <td>&lt; 50 years</td> <td>8.9 to 20.6</td> <td>3.2 to 7.4</td> </tr> <tr> <td>&gt; 50 years</td> <td>8.4 to 25.7</td> <td>3.0 to 9.2</td> </tr> <tr> <td>Adult, Female</td> <td></td> <td></td> </tr> <tr> <td>&lt; 50 years</td> <td>7.0 to 18.7</td> <td>2.5 to 6.7</td> </tr> <tr> <td>&gt; 50 years</td> <td>9.8 to 20.1</td> <td>3.5 to 7.2</td> </tr> </tbody> </table> <p>Values in the cited reference were converted from urea (mg/dL) to urea nitrogen (mg/dL), and subsequently converted to SI units for urea (mmol/L).</p> <p><b>NOTE:</b> The <b>REF</b> 7D75 Urea Nitrogen assay reports concentrations of urea nitrogen (mg/dL) in conventional units and concentrations of urea (mmol/L) in SI units.</p> <p><b>Mass Conversion of Urea Nitrogen to Urea</b>  mg/dL urea nitrogen × 2.14 = mg/dL urea  mg/dL urea ÷ 100 = g/L urea</p> <p><b>SI Unit Conversion of Urea</b>  g/L urea ÷ 60.0 g/mol = mol/L urea  mol/L urea × 1000 = mmol/L urea</p> <p><b>Urea<sup>10</sup></b></p> <table border="1"> <thead> <tr> <th></th> <th>Urea Nitrogen Range (g/day)</th> <th>Urea Range (mmol/day)</th> </tr> </thead> <tbody> <tr> <td>All</td> <td>12 to 20</td> <td>428 to 714</td> </tr> </tbody> </table>	Age	Urea Nitrogen Range (mg/dL)	Urea Range (mmol/L)	Children			1 to 3 years	5.1 to 16.8	1.8 to 6.0	4 to 13 years	7.0 to 16.8	2.5 to 6.0	14 to 19 years	8.4 to 21.0	3.0 to 7.5	Adult, Male			< 50 years	8.9 to 20.6	3.2 to 7.4	> 50 years	8.4 to 25.7	3.0 to 9.2	Adult, Female			< 50 years	7.0 to 18.7	2.5 to 6.7	> 50 years	9.8 to 20.1	3.5 to 7.2		Urea Nitrogen Range (g/day)	Urea Range (mmol/day)	All	12 to 20	428 to 714	1.00	1.40%	1.03	-0.90
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Uric Acid	Serum/Plasma: 2.0 - 8.0 mg/dL Urine: 250 - 750 mg/day	Male: 3.5 - 7.2 mg/dL Female: 2.6 - 6.0 mg/dL  Urine: 250 - 750 mg/day	1.00	2.02%	0.99	0.23																																							
U/CSF Total Protein	CSF: 15 - 45 mg/dL Urine - Random: <12 mg/dL Urine - 24 hr: <150 mg/TV	CSF: 15 - 45 mg/dL  Urine-Random: 1 - 14 mg/dL Urine-24 hr: <300 mg/day	Method comparison in progress																																										