

**BLOOD SCIENCES
 DEPARTMENT OF CLINICAL BIOCHEMISTRY**

Title of Document: Age-related reference ranges: Biochemistry

 Q Pulse Reference N^o: BS/CB/DCB/GEN/7

Authoriser: Peter Beresford

 Version N^o: 12

Page 1 of 6

Age Related Reference Ranges

Please contact the Duty Biochemist (Mon-Fri 9am-5pm) on 01174 14 8437 if you require further information.

Alkaline Phosphatase (ALP) IU/L

| Gender | Age | Low | High |
|--------|-------------------|-----|------|
| Both | less than 14 days | 90 | 273 |
| Both | 14 days - <1 year | 134 | 518 |
| Both | 1 - 9 years | 156 | 369 |
| Both | 10 - 12 years | 141 | 460 |
| | | | |
| Male | 13 - 14 years | 127 | 517 |
| Male | 15 - 16 years | 89 | 365 |
| Male | 17 - 18 years | 59 | 164 |
| Male | 19+ years | 30 | 130 |
| | | | |
| Female | 13 - 14 years | 62 | 280 |
| Female | 15 - 16 years | 54 | 130 |
| Female | 17 - 18 years | 48 | 130 |
| Female | 19+ years | 30 | 130 |

Anti-Mullerian Hormone (AMH) IU/L

| Gender | Age | Low | High |
|--------|-------------------|-----|------|
| Female | less than 60 days | 0 | 25 |
| | | | |
| Male | Less than 60 days | 100 | 1900 |
| Male | 60 days - <2y | 500 | 2300 |
| Male | 2 - <4 years | 300 | 1900 |
| Male | 4 - <11 years | 200 | 1400 |
| Male | 11 - <13 years | 70 | 1000 |
| Male | 13 - <18 years | 30 | 600 |
| Male | 18+ years | 25 | 140 |

Aspartate aminotransferase (AST) IU/L

| Gender | Age | Low | High |
|--------|-------------------|-----|------|
| Both | 0 – 14 days | 0 | 150 |
| Both | 15 days - <1 year | 0 | 60 |
| Both | 1 - 7 years | 0 | 40 |
| | | | |
| Male | Adult | 0 | 50 |
| Female | Adult | 0 | 35 |

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Page 2 of 6

Creatinine (serum) $\mu\text{mol/L}$

| Gender | Age | Low | High |
|--------|-------------------|-----|------|
| Both | less than 2 weeks | 27 | 77 |
| Both | 2 weeks - <1 year | 14 | 34 |
| Both | 1 - 2 years | 15 | 31 |
| Both | 3 - 4 years | 23 | 37 |
| Both | 5 - 6 years | 25 | 42 |
| Both | 7 - 8 years | 30 | 47 |
| Both | 9 - 10 years | 29 | 56 |
| Both | 11 years | 36 | 64 |
| Both | 12 years | 36 | 67 |
| | | | |
| Male | 13 years | 38 | 76 |
| Male | 14 years | 40 | 83 |
| Male | 15 years | 47 | 98 |
| Male | 16 years | 54 | 99 |
| Male | 17+ years | 59 | 104 |
| | | | |
| Female | 13 years | 38 | 74 |
| Female | 14 years | 43 | 75 |
| Female | 15 years | 44 | 79 |
| Female | 16 years | 48 | 81 |
| Female | 17+ years | 45 | 84 |

FSH IU/L

| Gender | Age | Low | High |
|--------|----------------|-----|------|
| Female | <1 year | 0 | 16 |
| Female | 1 – 8 years | 0.6 | 6.4 |
| Female | 9 – 11 years | 0.9 | 7.8 |
| Female | Follicular | 3.9 | 8.8 |
| Female | Mid-cycle | 4.5 | 22.5 |
| Female | Luteal | 18 | 5.1 |
| Female | Post-menopause | 16 | - |
| | | | |
| Male | <1 year | 0 | 4 |
| Male | 1 – 8 years | 0.2 | 2.3 |
| Male | 9 – 11 years | 0.6 | 5 |
| Male | 12 – 17 years | 1.3 | 7.4 |
| Male | >18 years | 1.3 | 19.3 |

GGT U/L

| Gender | Age | Low | High |
|--------|------------------|-----|------|
| Both | 0 – 14 days | 0 | 160 |
| Both | 15 days – 1 year | 0 | 100 |
| | | | |
| Male | >1 year | 0 | 55 |
| Female | >1 year | 0 | 38 |

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Page 3 of 6

Iron umol/L

| Gender | Age | Low | High |
|--------|--------------|-----|------|
| Both | 0 – 13 years | 3 | 25 |
| Both | >14 years | 11 | 32 |

LDH U/L

| Gender | Age | Low | High |
|--------|------------------|-----|------|
| Both | 0 - 14 days | 0 | 1020 |
| Both | 15 days - 1 year | 0 | 380 |
| Both | 1 - <10 years | 0 | 270 |
| Both | >10 years | 0 | 250 |

LH U/L

| Gender | Age | Low | High |
|--------|----------------|------|------|
| Female | <1 year | 0 | 3.3 |
| Female | 1 – 8 years | 0 | 2 |
| Female | 9 – 11 years | 0 | 8 |
| Female | Follicular | 2.1 | 10.9 |
| Female | Mid-cycle | 19.2 | 103 |
| Female | Luteal | 1.2 | 12.9 |
| Female | Post-menopause | 16 | - |
| | | | |
| Male | <1 year | 0 | 6.8 |
| Male | 1 – 8 years | 0 | 2 |
| Male | 9 - 13 years | 0 | 3.3 |
| Male | >14 years | 1.2 | 8.6 |

Lipase U/L

| Gender | Age | Low | High |
|--------|---------------|-----|------|
| Both | 0 – 9 years | 0 | 30 |
| Both | 10 – 17 years | 0 | 40 |
| Both | >18 years | 0 | 67 |

Free T3 pmol/L

| Gender | Age | Low | High |
|--------|--------------------|-----|------|
| Both | 0 – 14 days | 4.3 | 6.9 |
| Both | 15 days - <3 years | 4.0 | 6.2 |
| Both | >3 years | 3.8 | 6.0 |

Free T4 pmol/L

| Gender | Age | Low | High |
|--------|--------------------|-----|------|
| Both | 0 – 14 days | 17 | 57 |
| Both | 15 days - <3 years | 9.5 | 17.8 |
| Both | >3 years | 8.0 | 18.0 |

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Page 4 of 6

Galactitol $\mu\text{mol}/\text{mmol}$ creatinine

| Gender | Age | Low | High |
|--------|--------------------|-----|------|
| Both | less than 3 months | 3 | 80 |
| Both | 3 - 12 months | 10 | 65 |
| Both | 1 year | 6 | 22 |
| Both | 2 - 5 years | 3 | 17 |
| Both | 6 - 14 years | 2 | 10 |
| Both | 15+ years | 2 | 4 |

Galactokinase $\mu\text{mol}/\text{h/g}$ Hb

| Gender | Age | Low | High |
|--------|--------------|-----|------|
| Both | 0 - 6 months | 3.7 | 9.0 |
| Both | 6+ months | 1.5 | 4.0 |

Methylmalonic acid (Urine MMA) $\mu\text{mol}/\text{mmol}$ creatinine

| Gender | Age | Low | High |
|--------|------------------|-----|------|
| Both | less than 1 year | 0.4 | 23 |
| Both | 1 - 16 years | 2 | 5.1 |
| Both | 16+ years | 0.7 | 3.2 |

Mucopolysaccharide screen: Urine Glycosaminoglycans (mg GAG/ mmol creatinine)

| Gender | Age | Low | High |
|--------|---------------|-----|------|
| Both | 0 - 6 months | 0 | 30 |
| Both | 6 - 12 months | 0 | 26 |
| Both | 1 - 2 years | 0 | 21 |
| Both | 3 - 4 years | 0 | 14 |
| Both | 5 - 7 years | 0 | 11 |
| Both | 8 - 15 years | 0 | 9 |
| Both | 16+ years | 0 | 3 |

Oestradiol pmol/L

| Gender | Age | Low | High |
|--------|----------------|-----|------|
| Both | < 1 year | 0 | 200 |
| Both | 1 – 11 years | 0 | 80 |
| Male | >12 years | 0 | 120 |
| | | | |
| Female | Follicular | 80 | 420 |
| Female | Mid-cycle | 120 | 1900 |
| Female | Luteal | 130 | 900 |
| Female | Post-menopause | 0 | 110 |

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Page 5 of 6

Phenylalanine targets in PKU patients (bloodspots) $\mu\text{mol/L}$

| Gender | Age | Low | High |
|--------|--------------------|-----|------|
| Both | Up to 12 years | 120 | 360 |
| Both | 12+ years | 120 | 600 |
| | | | |
| Female | Trying to conceive | 120 | 250 |
| Female | Pregnant | 120 | 250 |

Phosphate mmol/L

| Gender | Age | Low | High |
|--------|------------------|------|------|
| Both | <1 month | 1.3 | 2.6 |
| Both | 1 month – 1 year | 1.3 | 2.4 |
| Both | 1 - 15 years | 0.90 | 1.80 |
| Both | 16+ years | 0.80 | 1.50 |

Phytanic acid $\mu\text{mol/L}$ Usually measured as part of VLCFA profile

| Gender | Age | Low | High |
|--------|------------------|-----|------|
| Both | <1 month | 0 | 5.4 |
| Both | 1 month – 1 year | 0 | 10.8 |
| Both | >1 year | 0 | 12.3 |

Potassium mmol/L

| Gender | Age | Low | High |
|--------|-------------------|-----|------|
| Both | Less than 4 weeks | 3.4 | 6.0 |
| Both | 4 weeks - 1 year | 3.5 | 5.7 |
| Both | 1 - 15 years | 3.5 | 5.3 |
| Both | 16+ years | 3.5 | 5.3 |

Progesterone nmol/L

| Gender | Age | Low | High |
|--------|----------------|-----|------|
| Male | <1 year | 0 | 20 |
| Male | >1 year | 0 | 5 |
| | | | |
| Female | <1 year | 0 | 30 |
| Female | 1 – 11 years | 0 | 5 |
| Female | Follicular | 0 | 4 |
| Female | Luteal | 12 | - |
| Female | Post-menopause | 0 | 2 |

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Page 6 of 6

Testosterone nmol/L

| Gender | Age | Low | High |
|--------|---------------|-----|-------------------------------|
| Male | <1 year | 0 | 10 |
| Female | <1 year | 0 | 2.2 |
| Both | 1 – 8 years | 0 | 0.7 |
| | | | |
| Male | 9 – 12 years | 0 | 1.7 |
| | 13 – 17 years | 0 | 20 (pubertal stage dependent) |
| | <18 years | 6 | 27 |
| | | | |
| Female | 9 – 11 years | 0 | 1.7 |
| Female | >12 years | 0 | 2.9 |

Triglycerides mmol/L

| Gender | Age | Low | High |
|--------|------------------|-----|------|
| Both | 0 – 14 days | 1 | 3.1 |
| Both | 15 days – 1 year | 0.6 | 3.1 |
| Both | 1 – 14 years | 0.5 | 2.4 |
| Both | 14+ years | 0.5 | 1.7 |

TSH mU/L

| Gender | Age | Low | High |
|--------|-------------|------|------|
| Both | 0 – 14 days | 0.79 | 5.9 |
| Both | >15 days | 0.38 | 5.33 |

Urea mmol/L

| Gender | Age | Low | High |
|--------|------------------|-----|------|
| Both | < 28 days | 0.8 | 5.5 |
| Both | 28 days – 1 year | 1.0 | 5.5 |
| Both | 1 – 16 years | 2.5 | 6.5 |
| Both | >16 years | 2.5 | 7.8 |

Urate (Uric acid) µmol/L

| Gender | Age | Low | High |
|--------|---------------|-----|------|
| Male | < 8 years | 60 | 240 |
| Male | 8 – 10 years | 70 | 350 |
| Male | 11 – 15 years | 120 | 460 |
| Male | >16 years | 200 | 430 |
| | | | |
| Female | < 8 years | 60 | 240 |
| Female | 8 – 10 years | 130 | 370 |
| Female | 11 – 15 years | 150 | 390 |
| Female | 16 – 49 years | 190 | 360 |
| Female | >50 years | 140 | 360 |