



Universitair Medisch Centrum
Utrecht

Laboratorium Klinische Chemie en Haematologie

REFERENTIEWAARDEN

(vanaf 1 maart 2013)

| | |
|--------------------------------|----------|
| Dienstdoende klinisch chemicus | #11-3510 |
| Centrale Balie | 58826 |
| Bloedtransfusie | 57672 |
| Polilaboratorium AZU | 57667 |
| Polilaboratorium WKZ | 54435 |
| Speciële Endocrinologie | 54336 |
| Speciële Haematologie | 57858 |
| Speciële Klinische Chemie | 58105 |

Klinisch chemici:

| | | |
|---------------------------------|-------------------------------------|----------|
| Prof. dr. Wouter W. van Solinge | Afdelingshoofd | 59594 |
| Dr. Hilde M. Dijkstra | Hoofd patiëntenzorg | #11-1775 |
| Dr. Maarten J. ten Berg | Klinische trials, pre-analyse | #11-3790 |
| Dr. Albert Huisman | Haematologie | #11-3457 |
| Dr. Hans Kemperman | Klinische chemie | #11-1519 |
| Dr. Eef G.W.M. Lentjes | Endocrinologie, speciële technieken | #11-1675 |
| Dr. Karen M.K. De Vooght | Bloedtransfusie, pediatrie en POC | #11-3792 |

Uitgebreide informatie over bepalingen, afnamecondities en referentiewaarden is te vinden op **www.lkch.nl**.

Chemie / Endocrinologie (SERUM/PLASMA)

| BEPALING | REFERENTIEWAARDE | EENHEID | OPMERKINGEN |
|---|--|---------|--|
| ACE (Ang.Conv.Enz.) | 8 – 21 | U/L | |
| ALAT | < 45 < 35 | U/L | M V |
| Albumine | 34 – 50 20 – 36 28 – 42 34 – 42 | g/L | 0 – 5 dgn 5 dgn – 1 jaar 1 – 3 jaar |
| Alfa-foetoproteïne | < 9 | µg/L | |
| Alkalische fosfatase | < 120 < 249 < 346 < 351 < 318 < 305 < 295 < 388 < 485 < 240 | U/L | 1 – 7 dgn 8 – 30 dgn 1 – 3 mnd 3 – 6 mnd 6 – 12 mnd 1 – 3 jaar 3 – 9 jaar 9 – 15 jaar 15 – 19 jaar |
| Ammoniak | < 35 | µmol/L | |
| Amylase | < 100 | U/L | |
| Apo AI | 1.10 – 2.05 1.25 – 2.15 | g/L | M V |
| Apo B | 0.55 – 1.40 0.55 – 1.25 | g/L | M V |
| ASAT | < 35 < 30 < 78 < 54 < 51 < 47 | U/L | M V 1 – 7 dgn 7 – 30 dgn 1 – 12 mnd 1 – 3 jaar |
| Bicarbonaat | 22 – 29 | mmol/L | |
| Bilirubine, totaal | 3 – 21 < 100 < 140 < 200 < 180 < 145 < 110 < 80 < 40 | µmol/L | 0 – 1 dag 1 – 2 dgn 3 – 5 dgn 5 – 10 dgn 10 – 15 dgn 15 – 20 dgn 20 – 25 dgn 25 – 30 dgn |
| Bilirubine, geconjugeerd (indien totaal bilirubine > 21) | < 5 < 10 | µmol/L | 0 – 10 dgn |
| BNP | < 30 | pmol/L | |

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|----------------------|---------------|---------------------------------|--------|--------------------|
| CA15.3 | | < 25 | U/mL | |
| CA19.9 | | < 35 | U/mL | |
| CA125 | | < 35 | U/mL | V |
| | | < 25 | | V, postmenopauzaal |
| Calcium, totaal | | 2.20 – 2.60 | mmol/L | |
| | | 1.96 – 2.64 | | 0 – 5 dgn |
| | | 2.17 – 2.64 | | 1 – 13 jaar |
| Calcium, geïoniseerd | | 1.15 – 1.32 | mmol/L | |
| | | 0.95 – 1.50 | | 0 – 6 mnd |
| CEA | | < 3.0 | µg/L | niet-rokers |
| | | < 10.0 | | rokers |
| Chloride | | 99 – 108 | mmol/L | |
| Cholesterol | | < 5.0 | mmol/L | streefwaarde |
| CK | | < 170 | U/L | M |
| | | < 145 | | V |
| | | 2 – 3 maal verhoogd | | neonaten |
| CK–MB massa | | < 8.0 | µg/L | |
| Cortisol | ochtend | 0.20 – 0.65 | µmol/L | |
| | middag | 0.10 – 0.35 | | |
| | korte remming | < 0.075 | | |
| Creatinine | | 64 – 104 | µmol/L | M |
| | | 49 – 90 | | V |
| | | 22 – 90 | | tot 2 mnd |
| | | 11 – 34 | | 2 mnd – 3 jaar |
| | | 21 – 65 | | 3 – 15 jaar |
| CRP | | < 10 | mg/L | |
| Ferritine | | 25 – 250 | µg/L | M |
| | | 20 – 150 | | V |
| Foliumzuur | | > 6.8 | nmol/L | nuchter |
| Fosfaat | | 0.80 – 1.50 | mmol/L | |
| | | 1.50 – 2.60 | | 1 – 5 dgn |
| | | 1.25 – 2.10 | | 1 – 3 jaar |
| | | 1.30 – 1.75 | | 3 – 6 jaar |
| | | 1.20 – 1.80 | | 6 – 11 jaar |
| | | 0.95 – 1.75 | | 11 – 15 jaar |
| | | 0.90 – 1.50 | | 15 – 19 jaar |
| FSH | | 3.0 – 12.0 | U/L | V, folliculair |
| | | 4.0 – 25.0 | | V, ovulatoir |
| | | 1.5 – 9.0 | | V, luteaal |
| | | 15.0 – 150.0 | | V, postmenopauzaal |
| | | 1.0 – 19.0 | | M |
| | | lager, afhankelijk van leeftijd | | kinderen |
| Galzuren | | < 12 | µmol/L | |

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|---------------------|---------------------------------|---------------------------|-----------------------------|
| Gamma-GT | < 55 | U/L | M |
| | < 40 | | V |
| | < 124 | | 1 – 7 dgn |
| | < 128 | | 7 – 30 dgn |
| | < 109 | | 1 – 3 mnd |
| | < 91 | | 3 – 6 mnd |
| | < 45 | | 6 – 12 mnd |
| GFR (geschat, MDRD) | > 60 | mL/min/1.73m ² | negroïde ras × 1.21 |
| Glucose | 3.6 – 5.6 | mmol/L | nuchter |
| | 3.6 – 6.4 | | neonaat |
| Haptoglobine | 0.3 – 2.0 | g/L | |
| HbA1c | 20 – 42 | mmol/mol | streefwaarde <53 |
| HCG | < 3 | IU/L | |
| HDL-cholesterol | 0.90 – 1.70 | mmol/L | M |
| | 1.10 – 2.00 | | V |
| Homocysteïne | 4 – 14 | µmol/L | >15 jaar |
| | 2 – 10 | | 0 – 15 jaar |
| | < 40 | | na methionine- belasting |
| Insuline | < 27 | mU/L | nuchter |
| Kalium | 3.8 – 5.0 | mmol/L | |
| | 3.2 – 5.5 | | tot 1 week |
| | 3.4 – 6.0 | | 1 week – 1 mnd |
| | 3.5 – 5.6 | | 1 – 6 mnd |
| | 3.5 – 6.1 | | 6 mnd – 1 jaar |
| Lactaat | < 2.2 | mmol/L | |
| LD | < 250 | U/L | |
| | < 765 | | 1 – 30 dgn |
| | < 450 | | 1 – 12 mnd |
| | < 395 | | 1 – 3 jaar |
| | < 345 | | 3 – 6 jaar |
| | < 325 | | 6 – 15 jaar |
| | < 235 | | 15 – 18 jaar |
| LDL-cholesterol | < 3.5 | mmol/L | streefwaarde |
| LH | 2.0 – 11.0 | U/L | V, folliculair |
| | 15.0 – 100.0 | | V, ovulatoir |
| | 1.0 – 13.0 | | V, luteaal |
| | 10.0 – 60.0 | | V, postmenopauzaal |
| | 1.0 – 9.0 | | M, < 70 jaar |
| | 3.0 – 30.0 | | M, > 70 jaar |
| | lager, afhankelijk van leeftijd | | kinderen |
| Lipase | < 67 | U/L | |
| Magnesium | 0.70 – 1.00 | mmol/L | |
| Myoglobine | < 100 | µg/L | |

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|------------------|-------------|--------------------|-----------|-----------------------|
| Natrium | | 136 – 146 | mmol/L | |
| Oestradiol | | 100 – 600 | pmol/L | V, folliculair |
| | | 400 – 2000 | | V, ovulair |
| | | 200 – 800 | | V, luteaal |
| | | 10 – 50 | | V, postmenopauzaal |
| | | 40 – 150 | | M, 20 – 50 jaar |
| | | 70 – 200 | | M, > 50 jaar |
| Osmolaliteit | | 280 – 295 | mOsmol/kg | |
| | | 275 – 305 | | tot 1 mnd |
| Procalcitonine | | < 0.5 | µg/L | |
| Progesteron | | 0.5 – 4.5 | nmol/L | V, folliculair |
| | | 3.0 – 9.0 | | V, ovulair |
| | | 15.0 – 60.0 | | V, luteaal |
| | | < 2.5 | | V, postmenopauzaal |
| | | 0.4 – 6.6 | | M |
| Prolactine | | 0.10 – 0.65 | U/L | M |
| | | 0.15 – 1.25 | | V, premenopauzaal |
| | | 0.10 – 0.95 | | V, postmenopauzaal |
| PSA, totaal | | < 2.0 | µg/L | tot 40 jaar |
| | | < 2.5 | | 40 – 50 jaar |
| | | < 3.5 | | 50 – 60 jaar |
| | | < 4.5 | | 60 – 70 jaar |
| | | < 6.5 | | 70 – 80 jaar |
| PTH | | 1 – 7 | pmol/L | bij normaal geïon. Ca |
| T3 | totaal | 1.0 – 3.0 | nmol/L | |
| | vrij | 3.0 – 7.0 | pmol/L | |
| T4 | totaal | 70 – 150 | nmol/L | |
| | vrij | 10 – 22 | pmol/L | |
| Totaal eiwit | | 60 – 80 | g/L | |
| Transferrine | | 2.0 – 4.0 | g/L | |
| | verzadiging | 0.25 – 0.60 | fractie | |
| Triglyceriden | | < 2.0 | mmol/L | nuchter |
| Troponine I | | < 60 | ng/L | |
| TSH | | 0.35 – 5.00 | mU/L | |
| Ureum | | 3.0 – 7.5 | mmol/L | |
| Urinezuur | | 0.30 – 0.50 | mmol/L | M |
| | | 0.15 – 0.47 | | V |
| Vitamine A | | 0.6 – 2.6 | µmol/L | |
| Vitamine B1 | | 65 – 200 | nmol/L | |
| Vitamine B6 | | 26 – 102 | nmol/L | |
| Vitamine B12 | | 130 – 700 | pmol/L | nuchter |
| 25-OH-Vitamine D | | 50 – 100 | nmol/L | streefwaarden |
| Vitamine E | | 12 – 42 | µmol/L | |

Bloedgassen (arterieel) (BLOEDGASSPUIT)

| BEPALING | REFERENTIEWAARDE | EENHEID | OPMERKINGEN |
|---------------------------|--------------------|---------|----------------------|
| pH | 7.37 – 7.45 | | |
| pCO ₂ | 35 – 45 | mm Hg | |
| | 4.7 – 6.0 | kPa | |
| pO ₂ | 70 – 100 | mm Hg | leeftijdsafhankelijk |
| | 9.3 – 13.3 | kPa | |
| Bicarbonaat (actueel) | 22 – 26 | mmol/L | |
| Base excess | -3 – +3 | mmol/L | |
| O ₂ -saturatie | 0.96 – 1.00 | fractie | |

Haematologie (EDTA-BLOED)

| BEPALING | REFERENTIEWAARDE | EENHEID | OPMERKINGEN | |
|-----------------------|--------------------|---------------------|--------------------|-----------|
| Hemoglobine | 8.6 – 10.7 | mmol/L | M | |
| | 7.4 – 9.6 | | V | |
| | 8.4 – 13.5 | | 1 – 3 dgn | |
| | 5.9 – 8.4 | | 3 dgn – 3 mnd | |
| | 6.5 – 8.4 | | 3 mnd – 1 jaar | |
| | 7.4 – 9.0 | | 1 – 12 jaar | |
| Hematocriet | 0.41 – 0.50 | fractie | M | |
| | 0.36 – 0.46 | | V | |
| | 0.44 – 0.64 | | 1 dag | |
| Trombocyten | 150 – 450 | 10 ⁹ /L | | |
| MPV | 7.0 – 9.5 | fL | | |
| reticulated platelets | 0.35 – 2.82 | % | | |
| Leukocyten | 4.0 – 10.0 | 10 ⁹ /L | | |
| | 8.0 – 30.0 | | 1 dag | |
| | 6.0 – 18.0 | | 0 – 3 jaar | |
| | 5.5 – 14.5 | | 3 – 7 jaar | |
| | 4.5 – 13.5 | | 7 – 16 jaar | |
| Erythrocyten | 4.2 – 5.5 | 10 ¹² /L | M | |
| | 3.7 – 5.0 | | V | |
| | 4.0 – 6.0 | | 1 – 3 dgn | |
| | 3.2 – 4.8 | | 0 – 3 mnd | |
| Indices | MCV | fL | 80 – 97 | |
| | | | 95 – 110 | |
| | | | 89 – 101 | |
| | | | 73 – 87 | |
| | | | 70 – 83 | |
| | | | 76 – 86 | |
| | MCH | 1.75 – 2.25 | fmol | |
| | RDW | 10.5 – 13.5 | %CV | |
| | Reticulocyten | 25 – 120 | 10 ⁹ /L | |
| | | 80 – 360 | | 1 – 2 dgn |
| IRF | | 0.10 – 0.30 | fractie | ratio |
| CHCr | 17.4 – 19.8 | mmol/L | | |

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|--------------------------|--|-------------|--|
| IJzer | 8 – 33 5 – 30 | µmol/L | M V |
| BSE (bezinking) | 1 – 11 2 – 24 0 – 2 3 – 13 1 – 5 2 – 12 | mm/uur | M V 0 – 1 mnd 1 mnd – 10 jaar 10 – 18 jaar (M) 10 – 18 jaar (V) |
| Zinkprotoporfyrine (ZPP) | < 0.22 | mmol/mol Hb | >1 jaar |

Differentiatie leukocyten

| BEPALING | REFERENTIEWAARDE | EENHEID | OPMERKINGEN |
|---|--|--------------------|--|
| Eosinofiele granulocyten | < 0.4 | 10 ⁹ /L | |
| Basofiele granulocyten | < 0.2 | 10 ⁹ /L | |
| Staafkernige granulocyten | < 0.6 | 10 ⁹ /L | |
| Neutrofiële granulocyten (segmentkernige granulocyten) | 1.6 – 8.3 6.0 – 26.0 1.5 – 10.0 1.5 – 8.5 1.5 – 8.0 | 10 ⁹ /L | 1 dag 0 – 3 jaar 3 – 7 jaar 7 – 16 jaar |
| Lymfocyten | 0.8 – 4.0 2.0 – 11.0 2.0 – 10.5 1.5 – 8.0 1.5 – 6.0 | 10 ⁹ /L | 1 dag 0 – 3 jaar 3 – 7 jaar 7 – 16 jaar |
| Monocyten | 0.2 – 0.8 0.4 – 3.1 | 10 ⁹ /L | 1 dag |

Stolling (CITRAATPLASMA)

| BEPALING | REFERENTIEWAARDE | EENHEID | OPMERKINGEN |
|---|----------------------------------|------------------------|----------------------------|
| Antiplasmine | 80 – 120 | % | |
| APC-resistentie | > 0.80 | ratio | |
| APTT | controlewaarde ± 5 | seconden | |
| Antitrombine | 90 – 110 | % | |
| Bloedingstijd (Surgicutt) | 2 – 8.30 < 2 | minuten.sec minuten | ≥ 5 maanden < 5 maanden |
| D-dimeren | < 0.5 | mg/L | |
| Factor II, VII, IX, X, XI, XII activiteit | 60 – 150 ± 50 | % | neonaten |
| Factor V, VIII activiteit | 60 – 150 ± 100 | % | neonaten |
| Factor XIII activiteit | 70 – 140 | % | |
| Fibrine monomeren | negatief | | |
| Fibrinogeen | 2.0 – 4.0 | g/L | |
| Heparine ratio | 2.5 – 4.5 | | therapeutische range |

| | | | |
|---------------------------|-----------------------------|----------|---------------------------------------|
| INR | 0.90 – 1.15 | | streefwaarde afhank. van indicatie |
| Proteïne C activiteit | 70 – 140 | % | |
| Proteïne S activiteit | 75 – 130 | % | M |
| | 59 – 130 | | V |
| PT | controlewaarde ± 1.5 | seconden | |
| Trombinetijd (TT) | controlewaarde ± 3 | seconden | |
| von Willebrand activiteit | 40 – 150 | % | |
| von Willebrand antigeen | 60 – 130 | % | |

Urine

| BEPALING | REFERENTIEWAARDE | EENHEID | OPMERKINGEN |
|-----------------------|----------------------|----------|-------------|
| Strip/Sediment | | | |
| Eiwit | negatief | | |
| Erythrocyten | < 10 | per µL | |
| Glucose | negatief | | |
| Ketonen | negatief | | |
| Leukocyten | < 25 | per µL | |
| pH | 4.5 – 8.0 | | |
| Reducerende suikers | negatief | | |
| Soortelijk gewicht | 1.003 – 1.029 | g/mL | |
| Kwantitatief | | | |
| Amylase | 25 – 410 | U/24u | |
| Calcium | 2.5 – 7.5 | mmol/24u | |
| Chloride | 100 – 250 | mmol/24u | |
| Cortisol, vrij | 90 – 450 | nmol/24u | |
| Creatinine | 9 – 18 | mmol/24u | |
| Creatinine klaring | 88 – 128 | mL/min | |
| Fosfaat | 12.9 – 42 | mmol/24u | |
| Kalium | 25 – 125 | mmol/24u | |
| Magnesium | 3.0 – 5.0 | mmol/24u | |
| Microalbumine | < 30 | mg/24u | |
| Natrium | 50 – 220 | mmol/24u | |
| Totaal eiwit | 0.01 – 0.14 | g/L | portie |
| | < 0.10 | g/24u | |
| Ureum | 430 – 700 | mmol/24u | |
| Urinezuur | 1.5 – 4.4 | mmol/24u | |

Speeksel

| BEPALING | REFERENTIEWAARDE | EENHEID | OPMERKINGEN |
|----------------|------------------|---------|-------------|
| Cortisol, vrij | 1 – 6 | nmol/L | om 23 uur |