

Evaluation of MiniCollect® Lithium Heparin Tubes with spray-dried additive

Background:

Greiner Bio-One has developed new MiniCollect® tubes incorporating spray-dried additives. The advantage of the new technology is that the additive is more uniformly coated on the inner tube walls and the mixing characteristics are improved.

The MiniCollect® Lithium Heparin capillary blood collection tube is also featured with the unique cross-cut cap which does not need to be removed during the collection and sampling process.

Clotting is inhibited by the presence of a spray dried Lithium Heparin coating the interior of the tube. Heparinised plasma is the virtually cell-free supernatant following the centrifugation of whole blood. Heparin works by accelerating the inhibition of factor Xa by antithrombin III.

MiniCollect® Lithium Heparin tubes are intended for use in testing parameters in clinical chemistry.

Study Objective:

A clinical evaluation was carried out to compare the performance of the new spray-dried MiniCollect® Lithium Heparin tube in comparison to the Becton Dickinson Microtainer® LH Lithium Heparin tube.

Study design:

The following tube types were used in this study:

Sample ID	Description
A	MiniCollect® Lithium Heparin 1 ml, spray dried (Item No.: 450477)
B	Microtainer® Lithium Heparin 0,4 ml, (Item No.: 365966)

Directly after blood collection with venous blood, the tubes were carefully inverted according to the instructions given by the tube manufacturers. The listed analytes were tested using an ADVIA® Centaur from Bayer (for TSH, FT3, FT4 and Cortisol) and an ADVIA® 1650 for the rest of the listed parameters. Analysis was performed with the instruments' accompanying reagents.

Determined parameters:

- Creatine Phosphokinase
- Lactate Dehydrogenase
- Glutamic-oxaloacetic Transaminase
- Glutamic-pyruvic Transaminase
- Gamma-glutamyl Transpeptidase
- Alkaline Phosphatase

- Uric Acid
- Total Bilirubin
- Cholesterol
- Triglyceride
- Sodium
- Potassium
- Chloride
- Calcium
- Phosphate
- Magnesium
- Iron
- Urea
- Blood Urea Nitrogen
- Creatinine
- Total Protein
- free Triiodothyronine
- free Thyroxine
- Thyroid-Stimulating Hormone
- Cortisol

Conclusion:

The results of this study show a slightly positive bias for the Microtainer® Lithium Heparin tube results, compared to the MiniCollect® Lithium Heparin tube. It is considered to be due to a preanalytical handling difference: The Microtainer® tubes had to be decapped before centrifugation, resulting in evaporation and consequently in a loss of sample of up to 2 %. Therefore the sample-concentration is slightly increased in general, explaining higher results of the analytes in the Microtainer® tube. Taking this phenomena into consideration, it can be concluded that the MiniCollect® Lithium Heparin tube with spray-dried additive demonstrated equivalent performance to the Microtainer® Lithium Heparin tube.

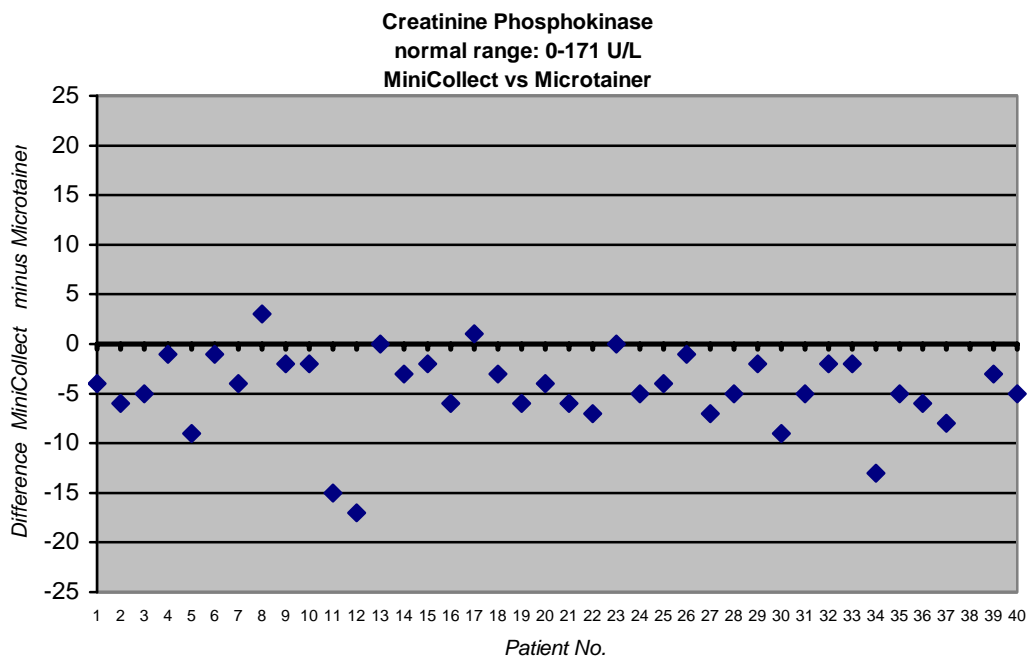
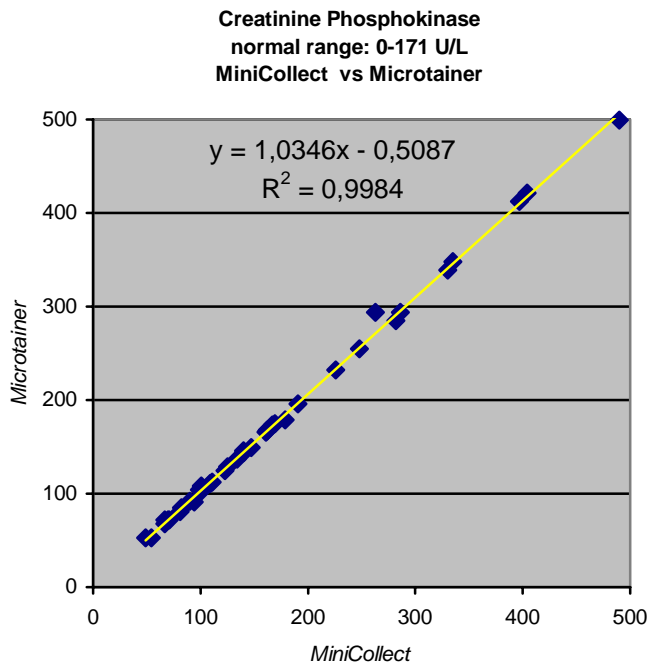
References:

- (1) Greiner Bio-One. MiniCollect® Capillary Blood Collection Product Range. Instructions for Use. Kremsmünster, Austria. 2006.
- (2) Greiner Bio-One. MiniCollect® Product Manual. Kremsmünster, Austria. 2003.

- (3) Becton Dickinson and Company, BD Microtainer[®] Chemistry Tubes. Instructions for Use, Franklin Lakes. 2006
- (4) Guideline published by the Chamber Association for Medical Practitioners of the State of Germany concerning the quality assurance of quantitative analyses of Medical Laboratories, Germany (2001). Rev.2003
- (5) ISO 6710:1995(E), *Single-use containers for venous blood specimen collection*. International Standard. Genève, Switzerland (1995)
- (6) EP7-A: *Interference Testing in Clinical Chemistry*; Approved Guideline. CLSI (formerly NCCLS) document (ISBN 1-56238-480-5). CLSI, 940 West Valley Road, Suite 1400, Wayne, Pennsylvania 19087-1898, USA 2002.
- (7) EP9-A2: *Method Comparison and Bias Estimation Using Patient Samples*; Approved Guideline—Second Edition. CLSI (formerly NCCLS) document EP9-A2 (ISBN 1-56238-472-4). CLSI, 940 West Valley Road, Suite 1400, Wayne, Pennsylvania 19087-1898 USA, 2002.

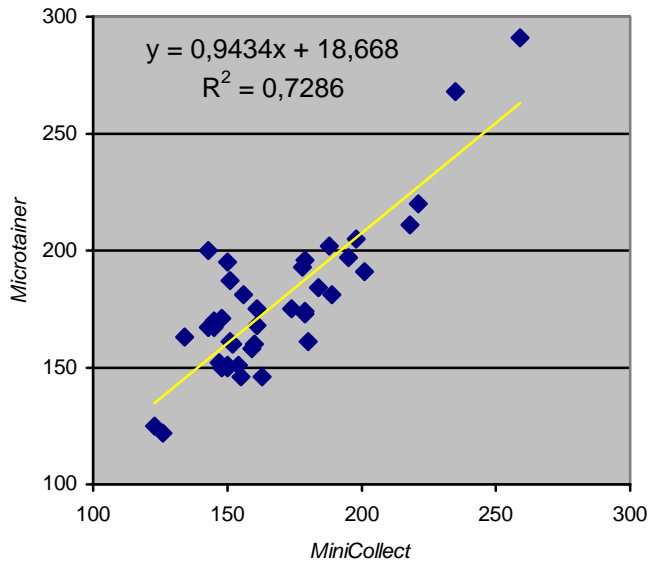
Results in detail:

Creatinine Phosphokinase

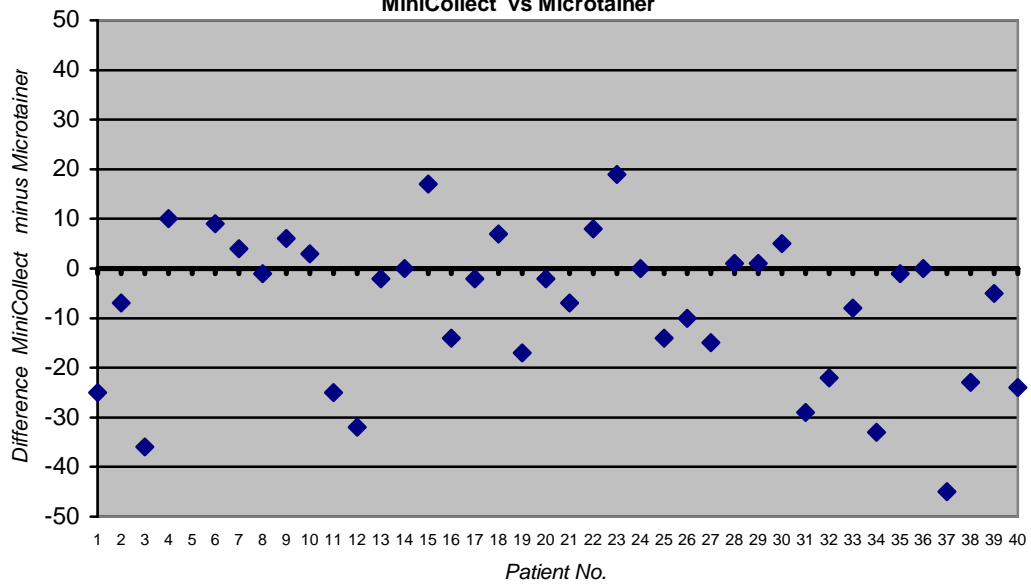


Lactate Dehydrogenase

Lactate Dehydrogenase
normal range: 0-248 U/L
MiniCollect vs Microtainer

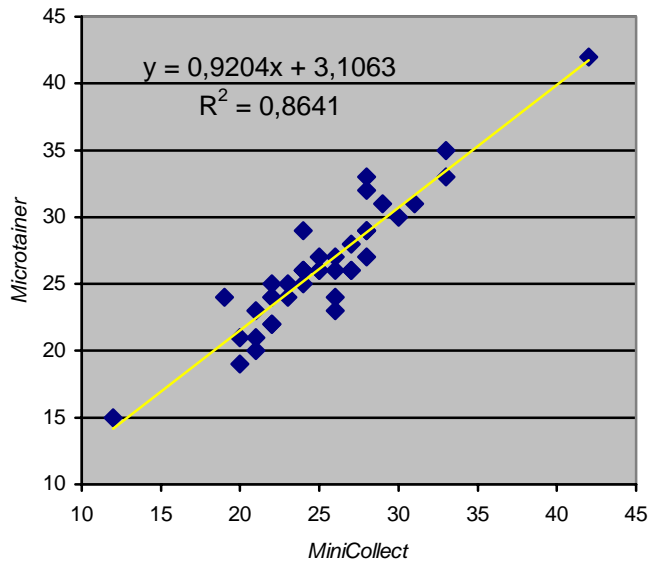


Lactate Dehydrogenase
normal range: 0-248 U/L
MiniCollect vs Microtainer

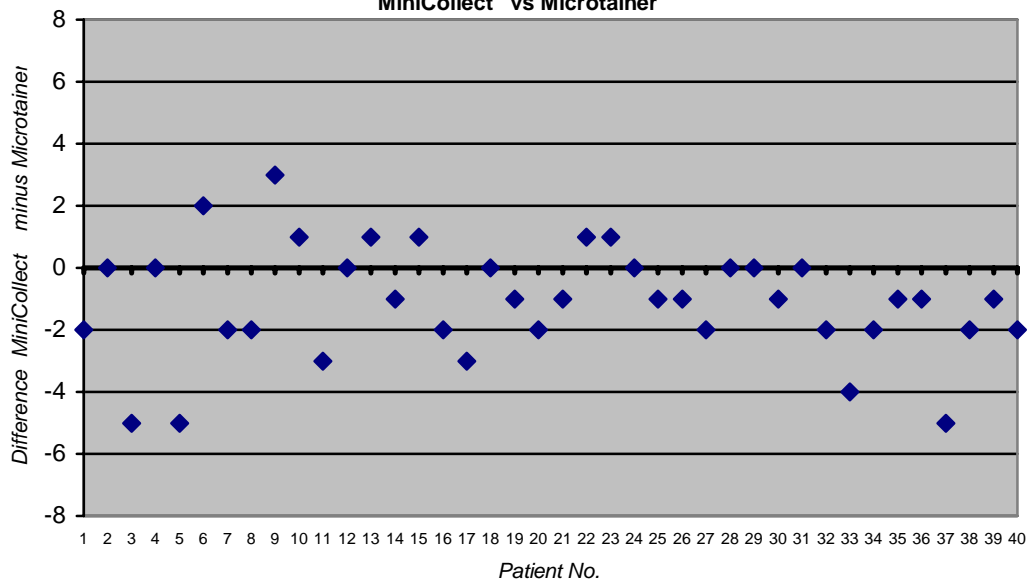


Glutamic-oxaloacetic Transaminase

Glutamic-oxaloacetic Transaminase
normal range: 0-35 U/L
MiniCollect vs Microtainer

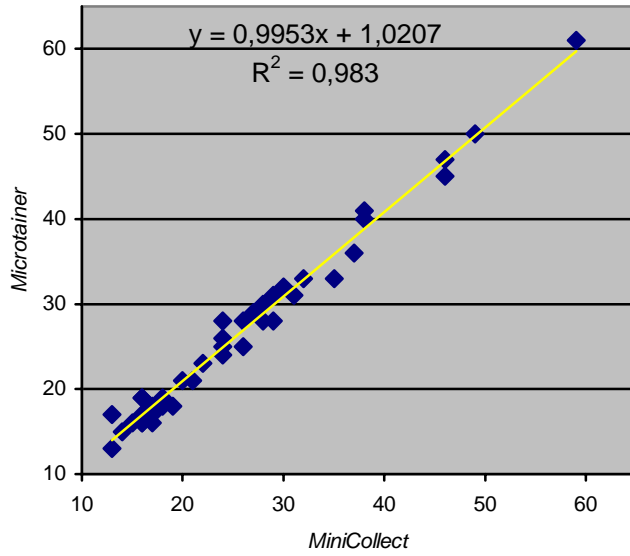


Glutamic-oxaloacetic Transaminase
normal range: 0-35 U/L
MiniCollect vs Microtainer

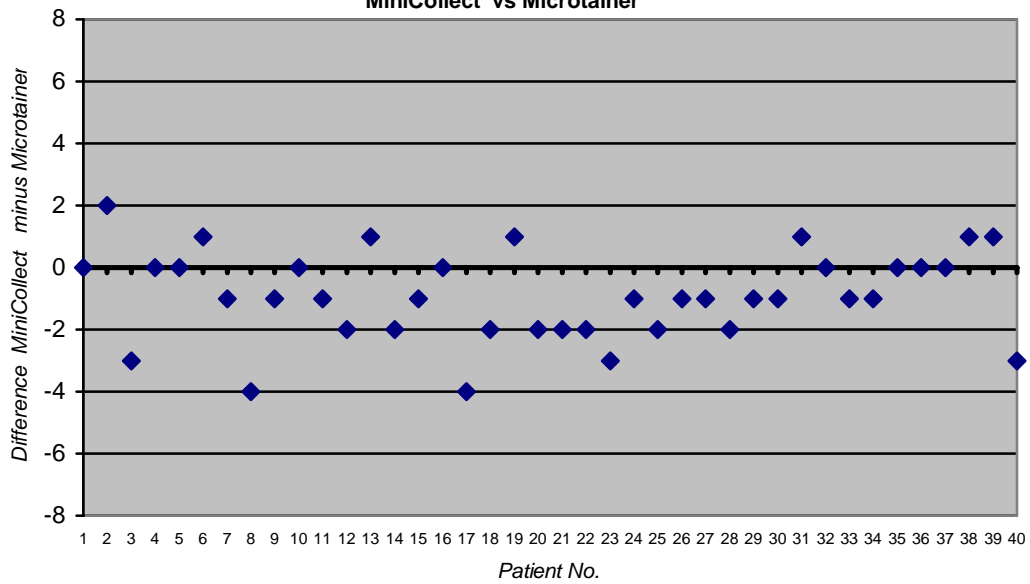


Glutamic-pyruvic Transaminase

Glutamic-pyruvic Transaminase
normal range: 0 - 45 U/l
MiniCollect vs Microtainer

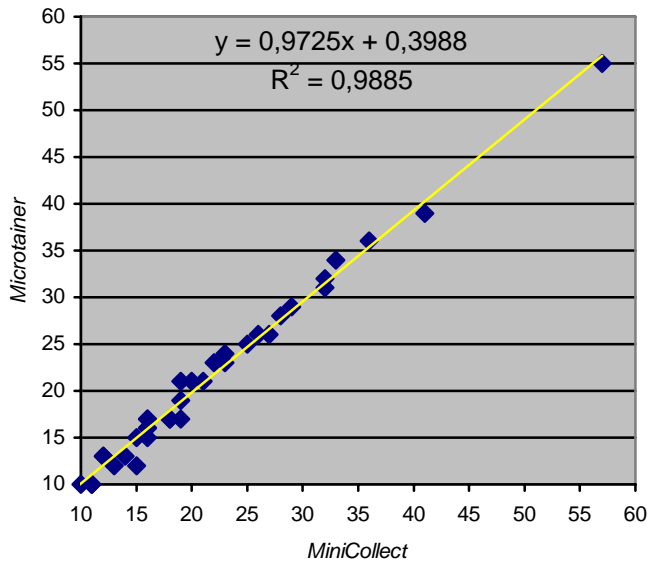


Glutamic-pyruvic Transaminase
normal range: 0 - 45 U/l
MiniCollect vs Microtainer

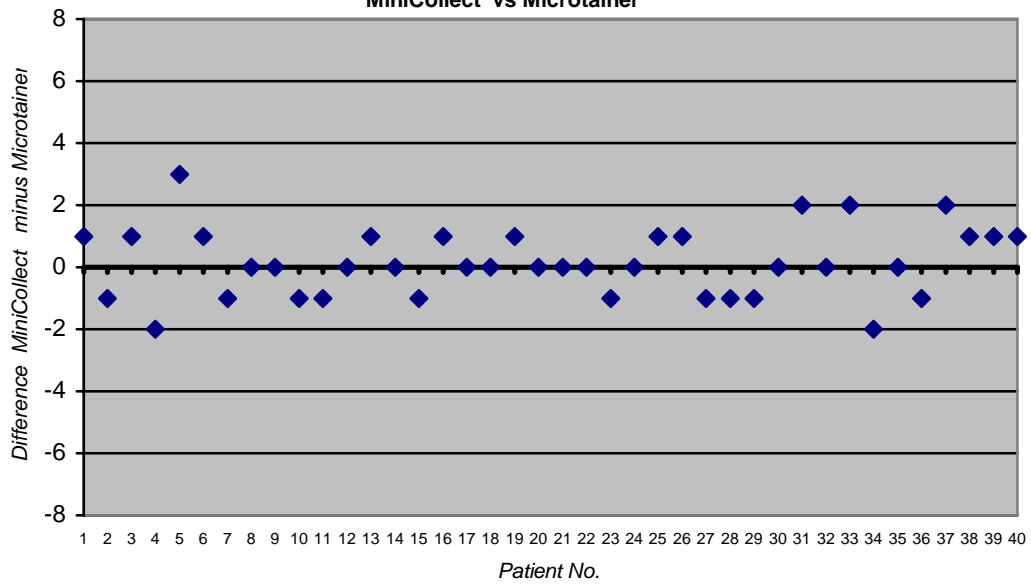


Gamma-glutamyl Transpeptidase

Gamma-glutamyl Transpeptidase
normal range: 0 - 55 U/l
MiniCollect vs Microtainer

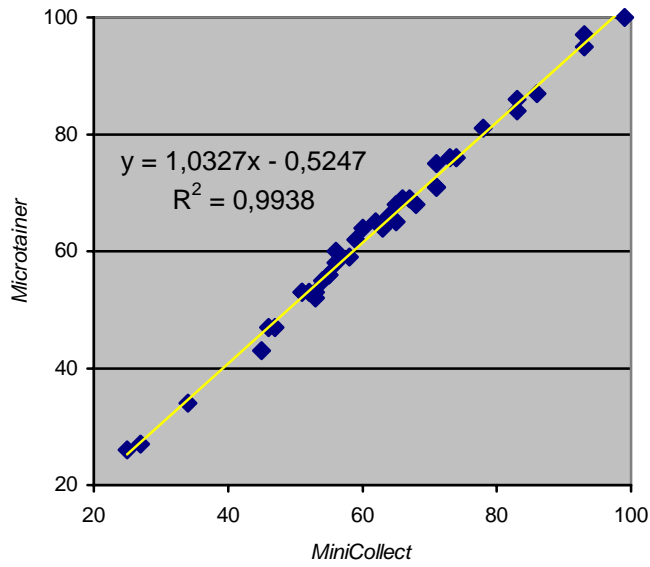


Gamma-glutamyl Transpeptidase
normal range: 0 - 55 U/l
MiniCollect vs Microtainer

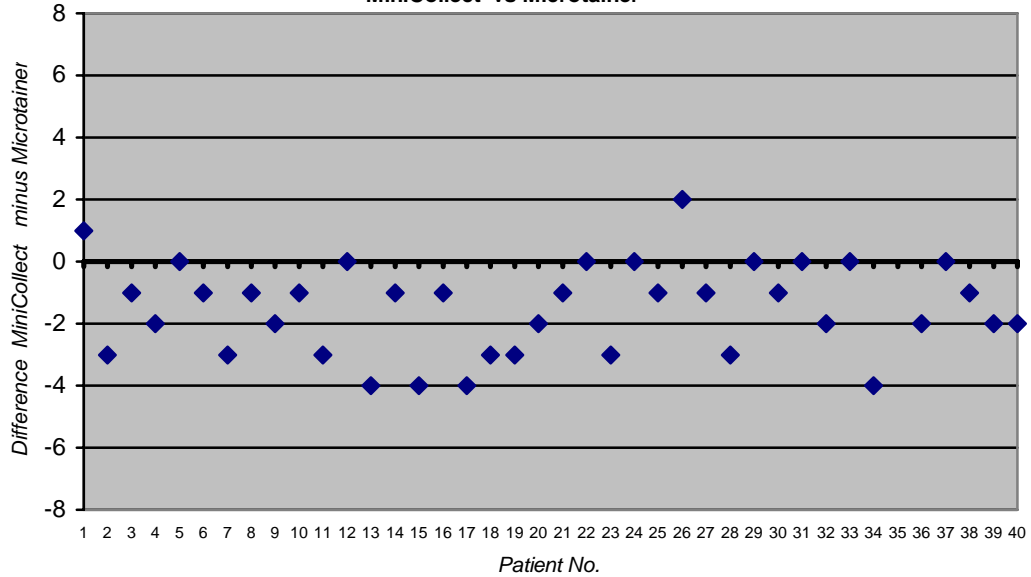


Alkaline Phosphatase

Alkaline Phosphatase
normal range: 30 - 120 U/L
MiniCollect vs Microtainer

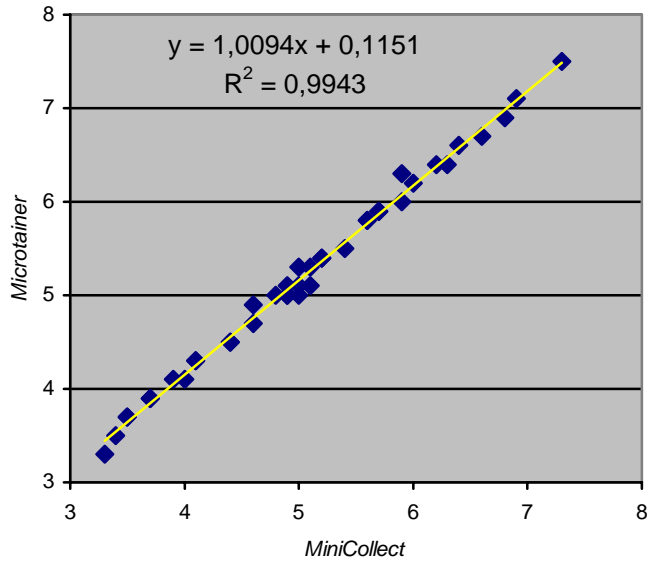


Alkaline Phosphatase
normal range: 30-120 U/l
MiniCollect vs Microtainer

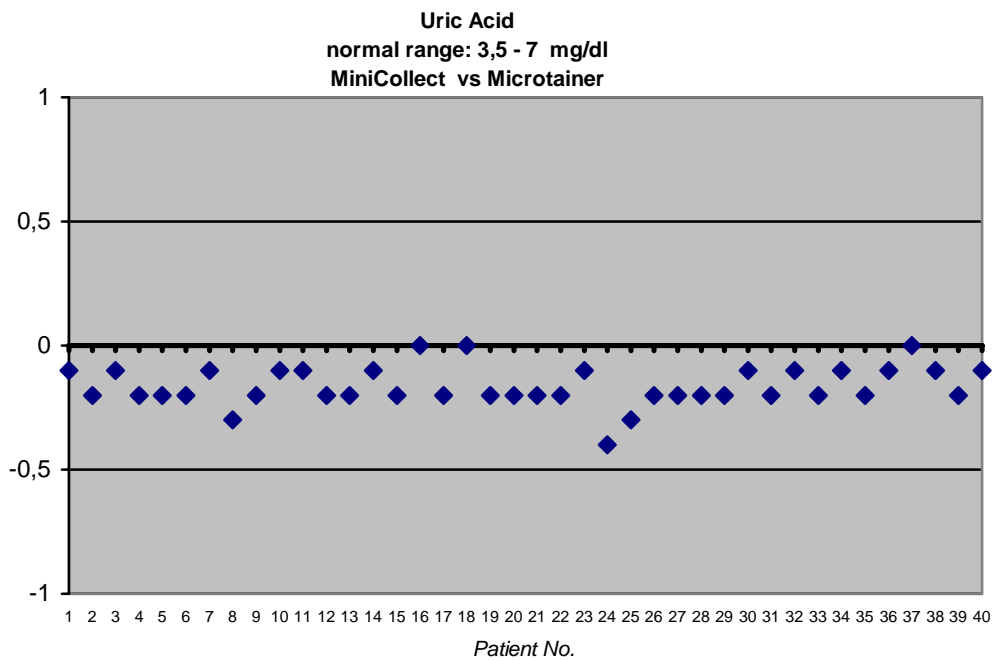


Uric Acid

Uric Acid
normal range: 3,5 - 7 mg/dl
MiniCollect vs Microtainer



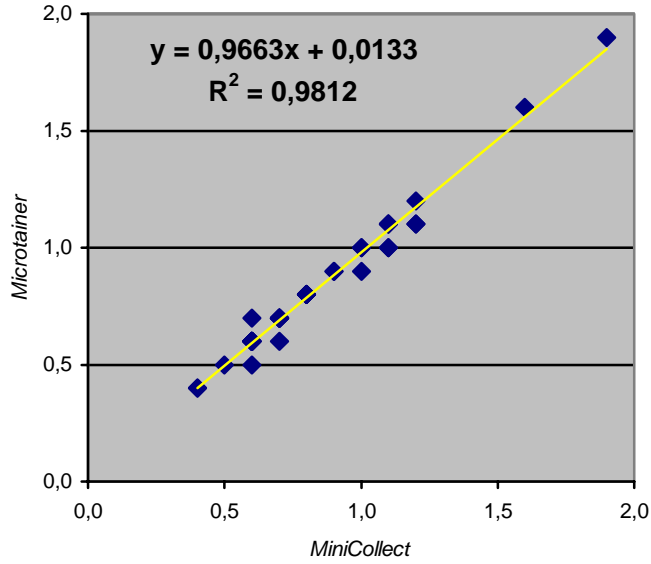
MiniCollect



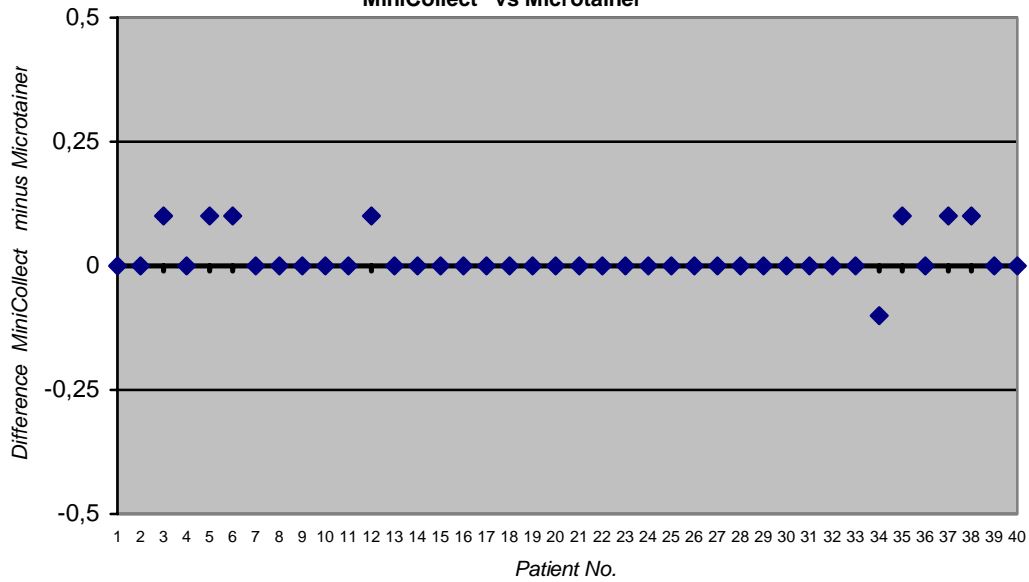
Patient No.

Total Bilirubin

Total Bilirubin
 normal range: 0 - 1 mg/dl
 MiniCollect vs Microtainer

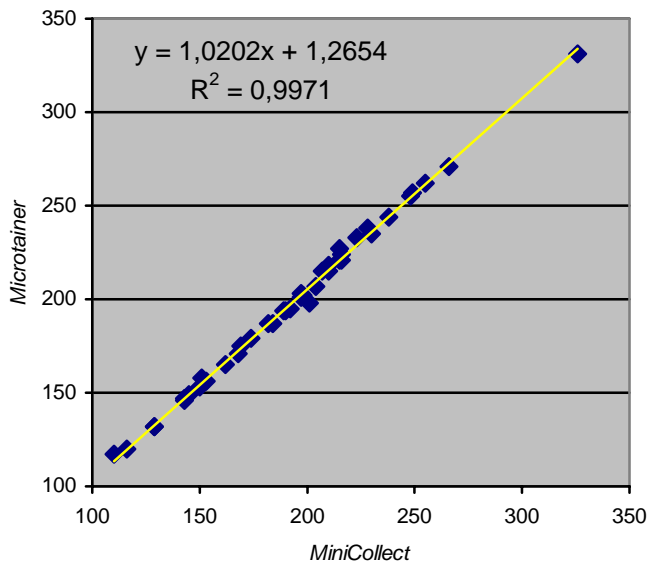


Total Bilirubin
 normal range: 0 - 1 mg/dl
 MiniCollect vs Microtainer

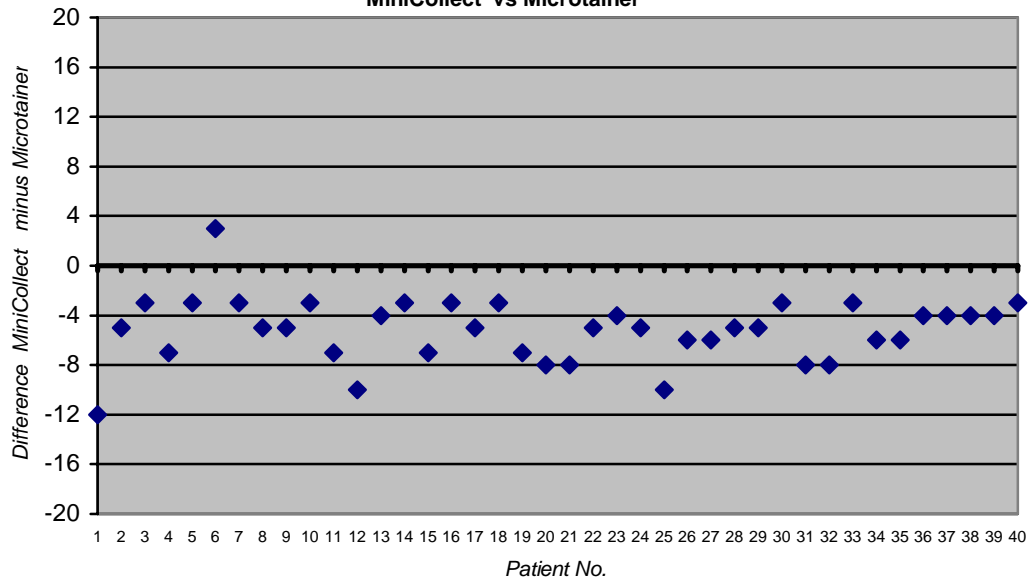


Cholesterol

Cholesterol
normal range: 100 - 200 mg/dl
MiniCollect vs Microtainer

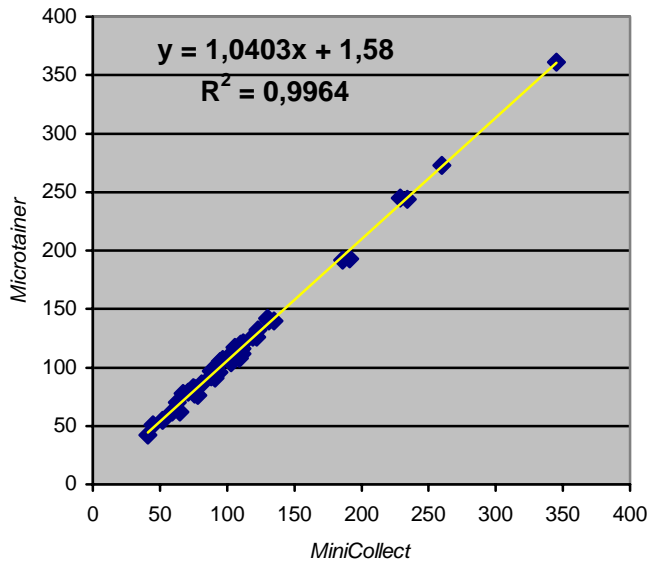


Cholesterol
normal range: 100 - 200 mg/dl
MiniCollect vs Microtainer

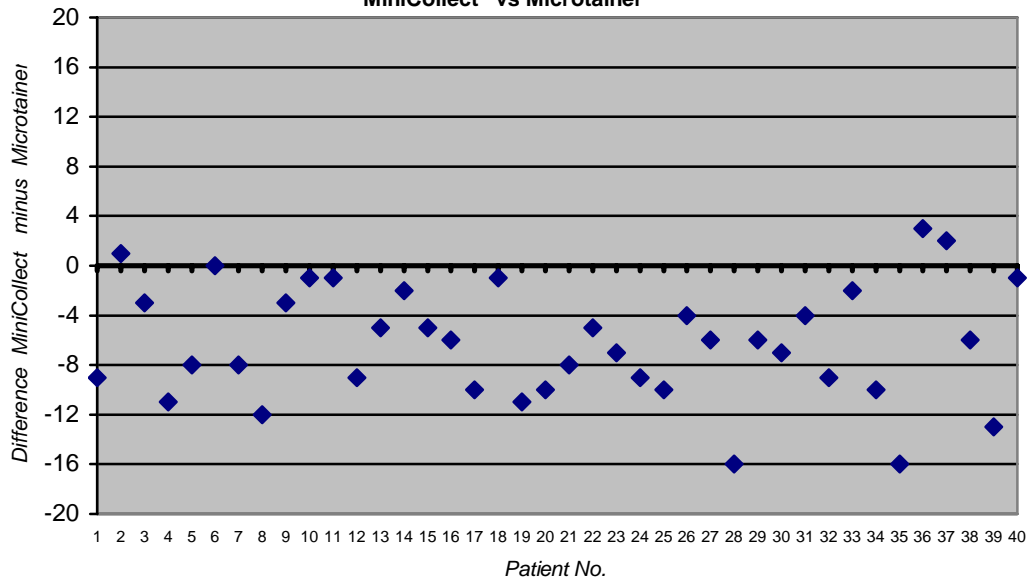


Triglyceride

Triglyceride
normal range:25-180 mg/dL
MiniCollect vs Microtainer

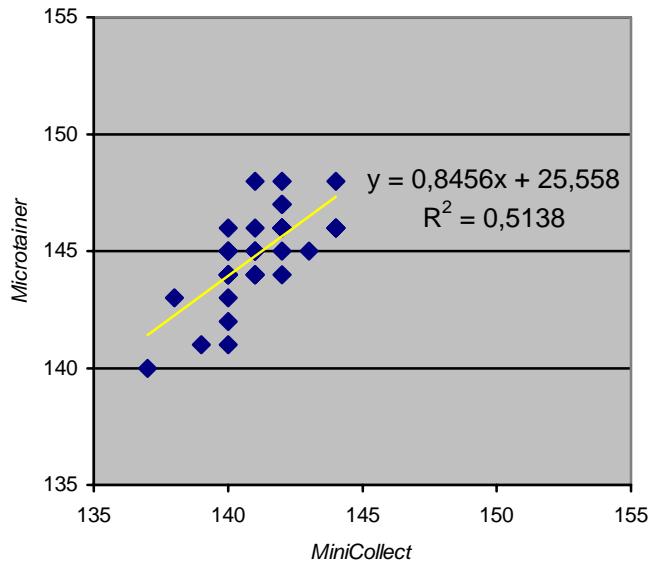


Triglyceride
normal range:25-180 mg/dL
MiniCollect vs Microtainer

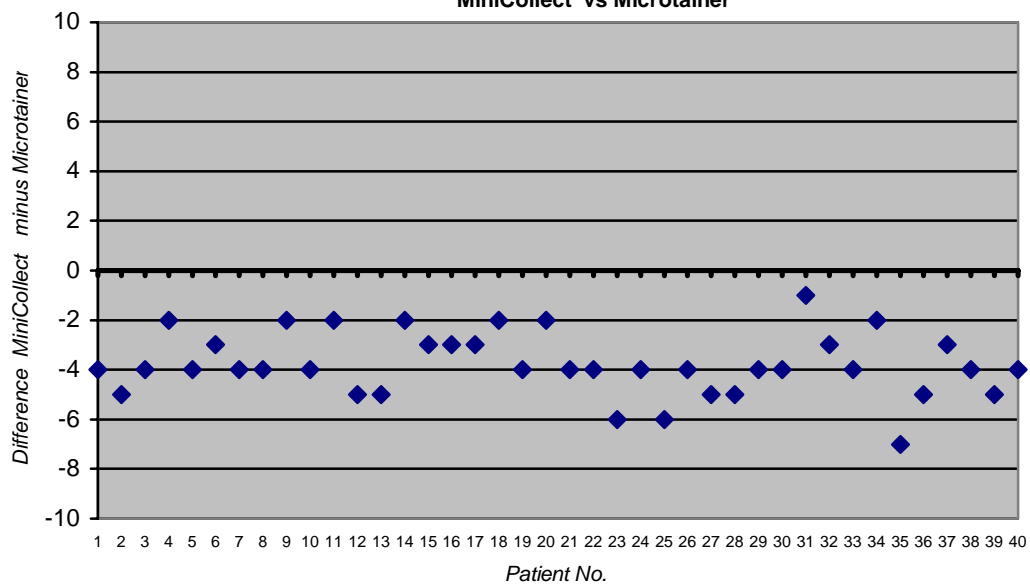


Sodium

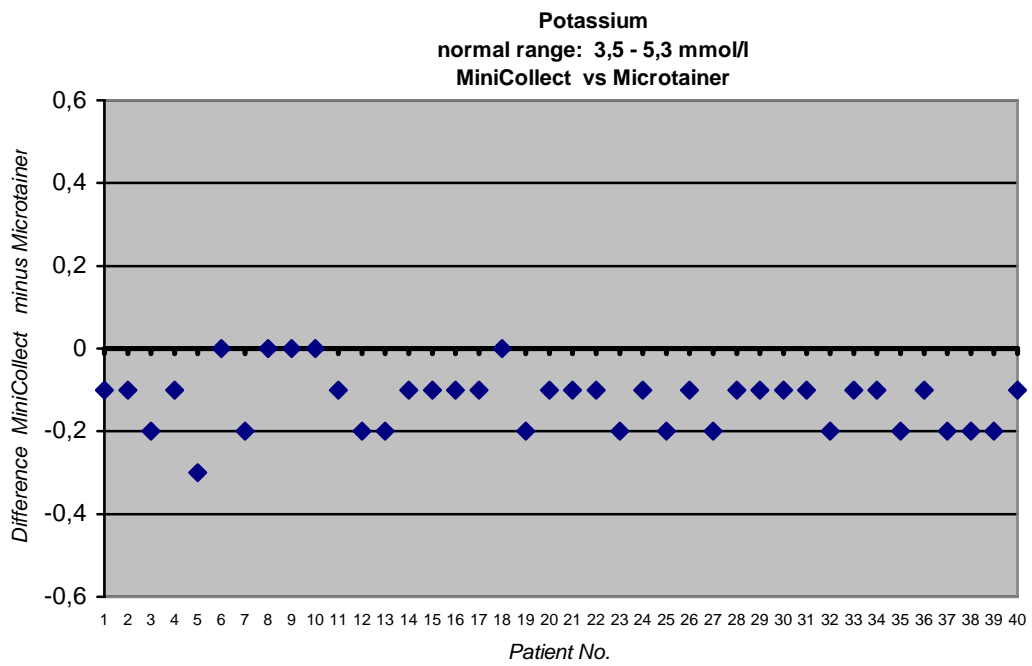
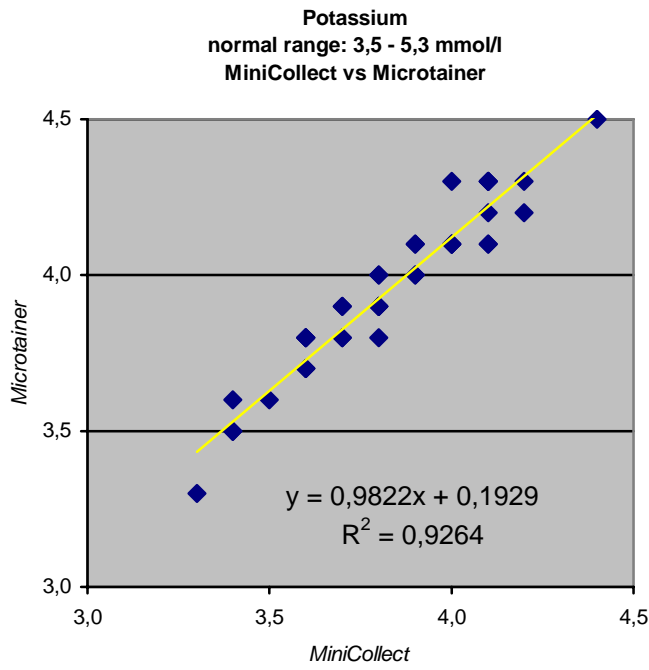
Sodium
normal range: 135 - 150 mmol/l
MiniCollect vs Microtainer



Sodium
normal range: 135 - 150 mmol/l
MiniCollect vs Microtainer

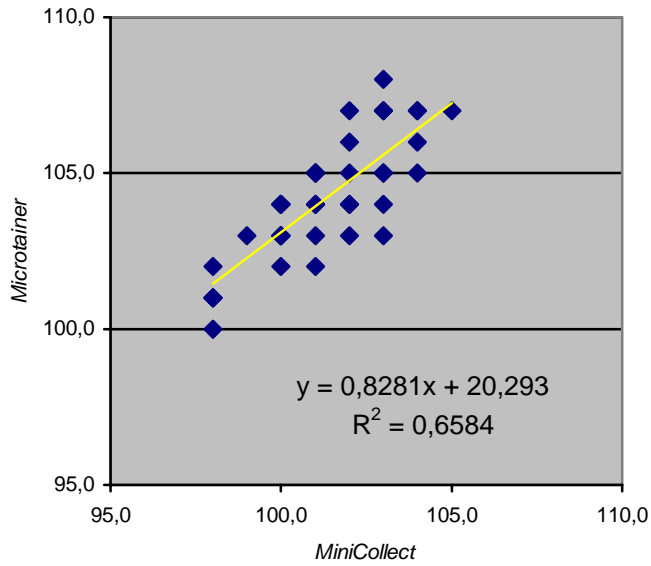


Potassium

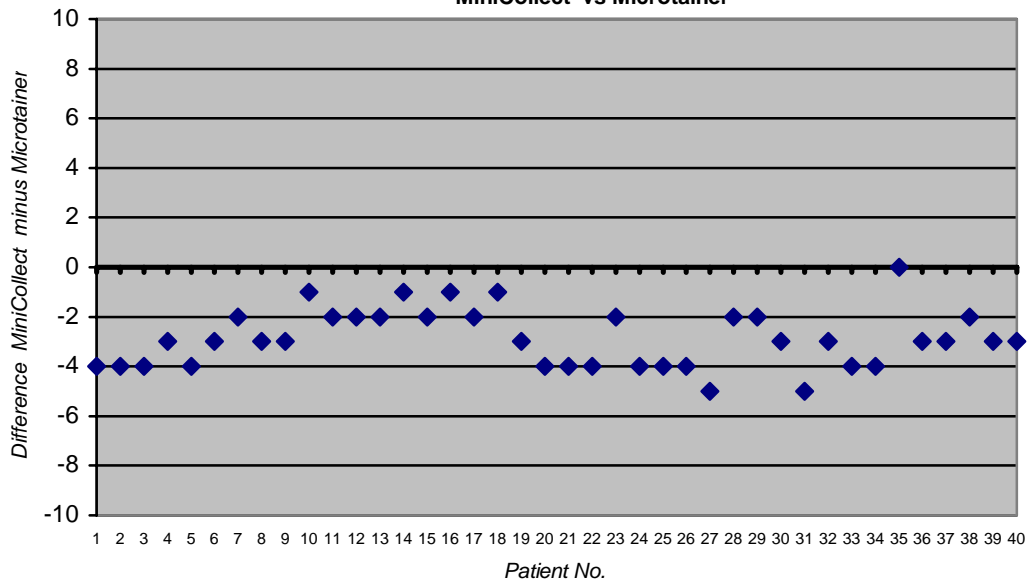


Chloride

Chloride
normal range: 97 – 108 mmol/l
MiniCollect vs Microtainer

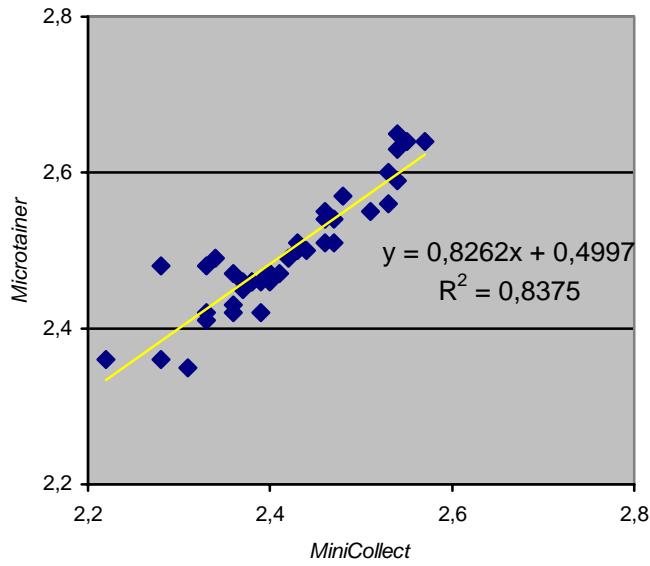


Chloride
normal range: 97 – 108 mmol/l
MiniCollect vs Microtainer

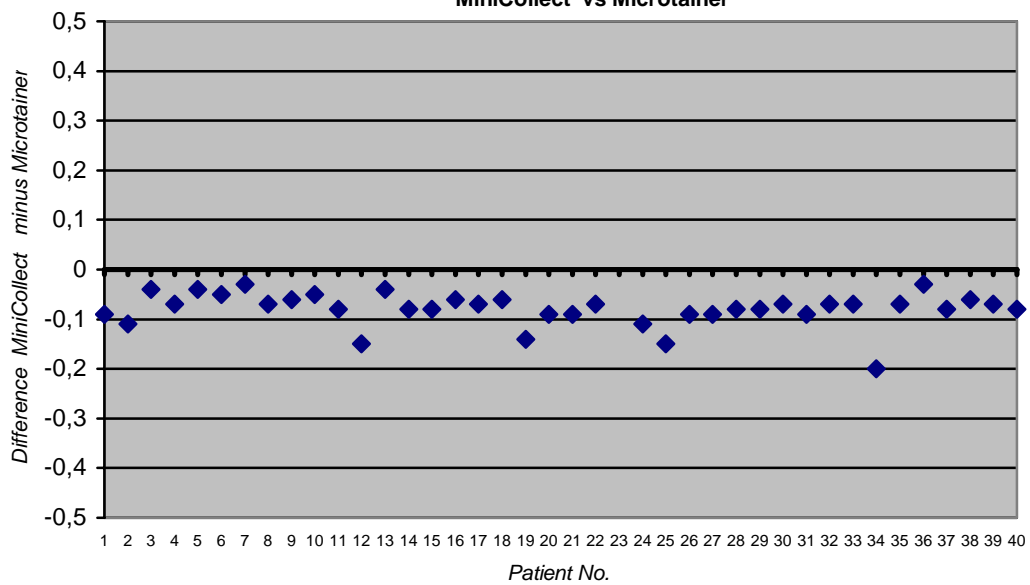


Calcium

Calcium
normal range: 2,1 – 2,7 mmol/l
MiniCollect vs Microtainer

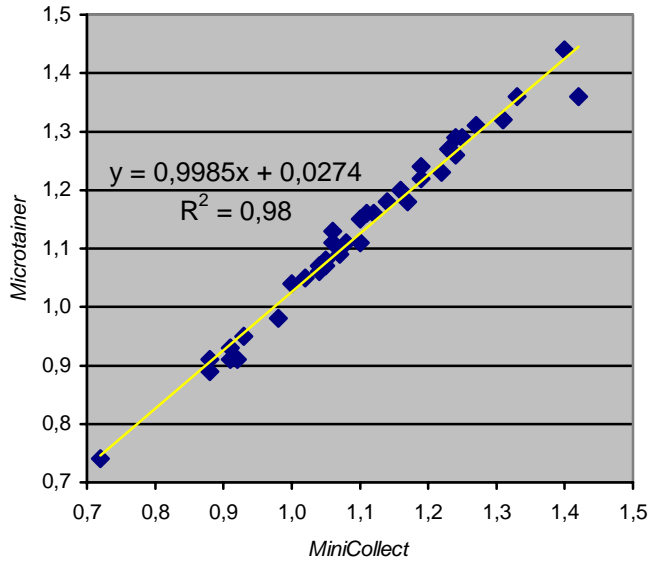


Calcium
normal range: 2,1 – 2,7 mmol/l
MiniCollect vs Microtainer

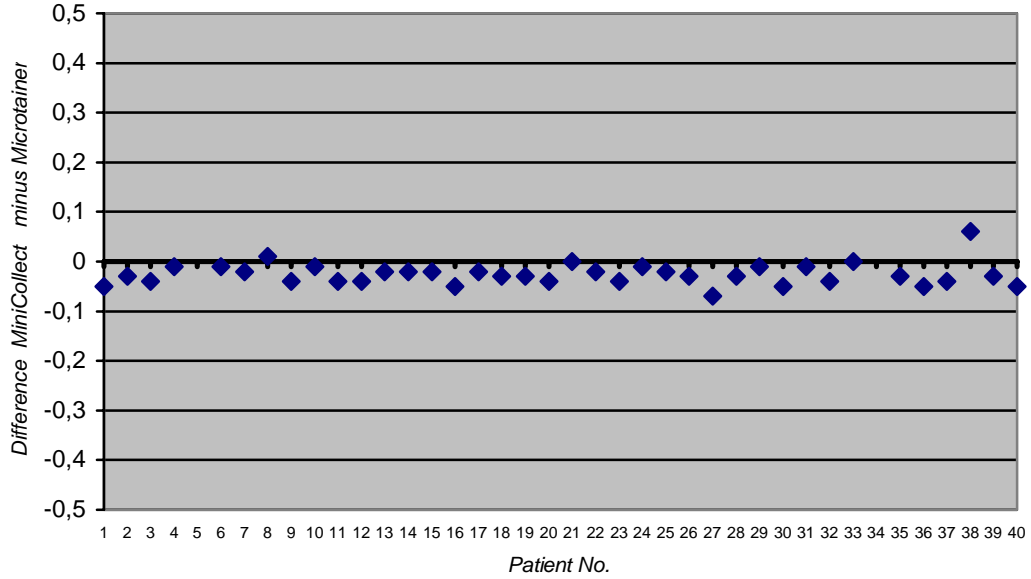


Phosphate

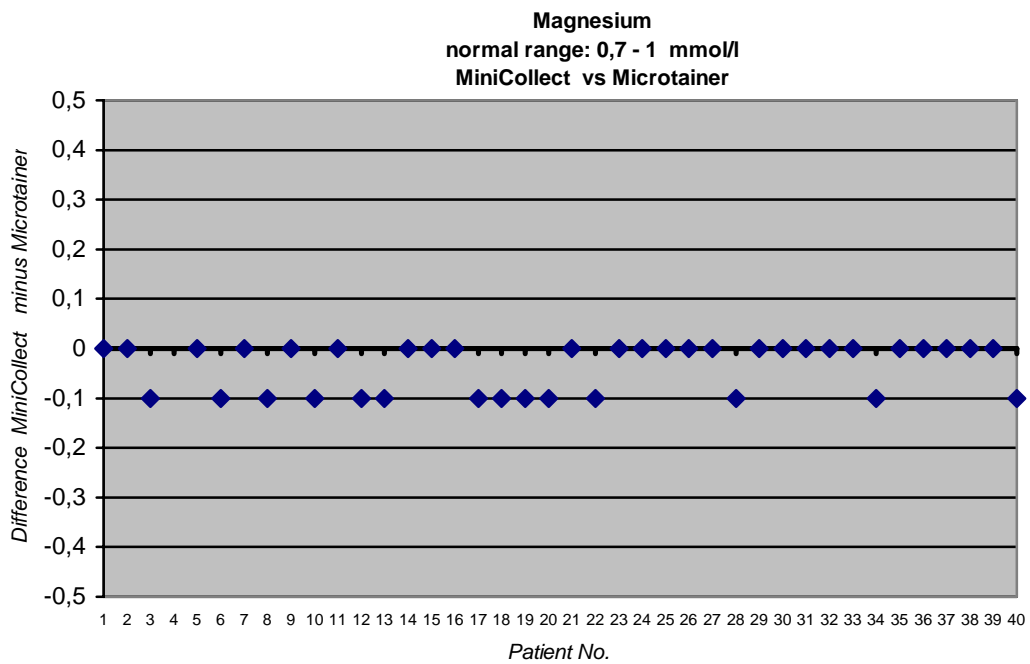
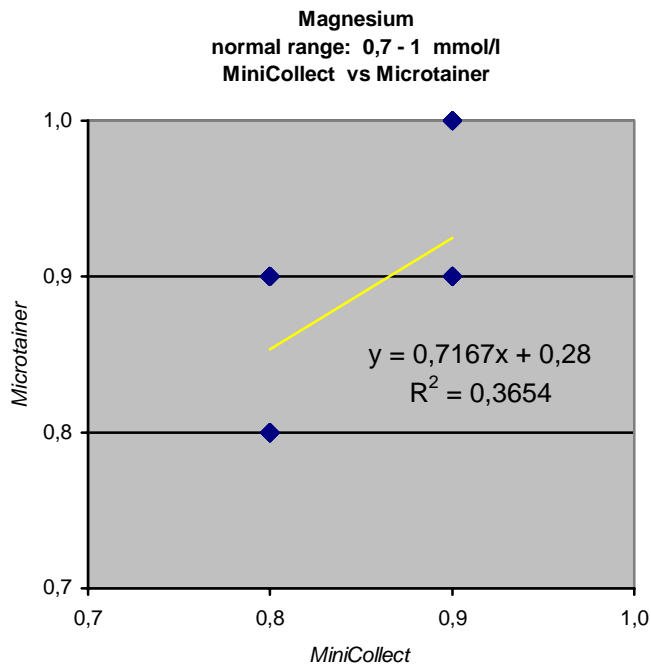
Phosphate
normal range: 0,77 - 1,45 mmol/l
MiniCollect vs Microtainer



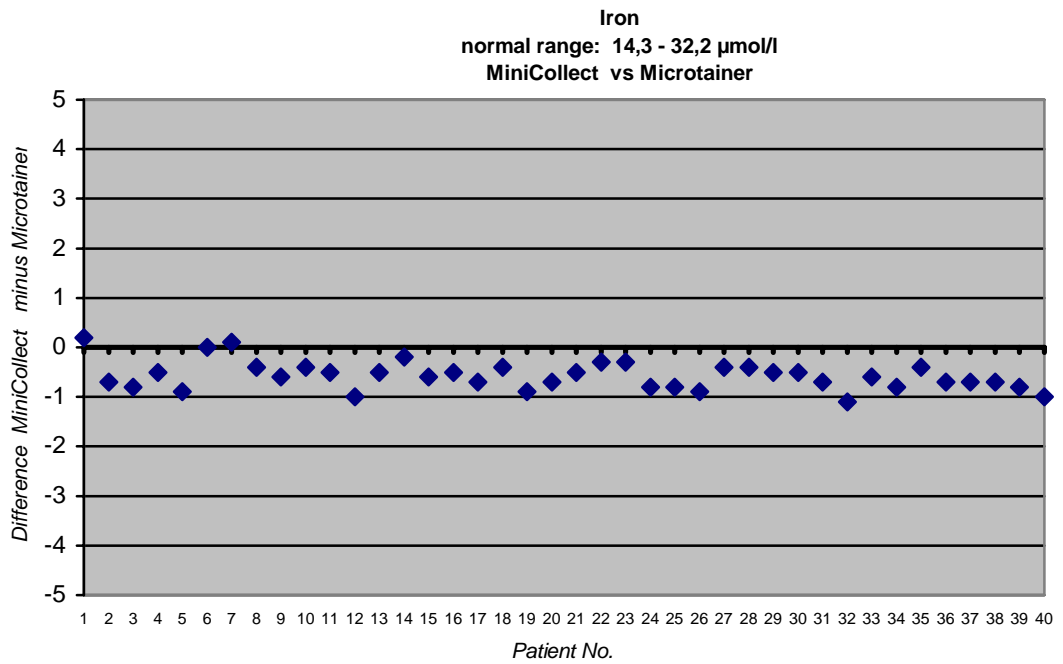
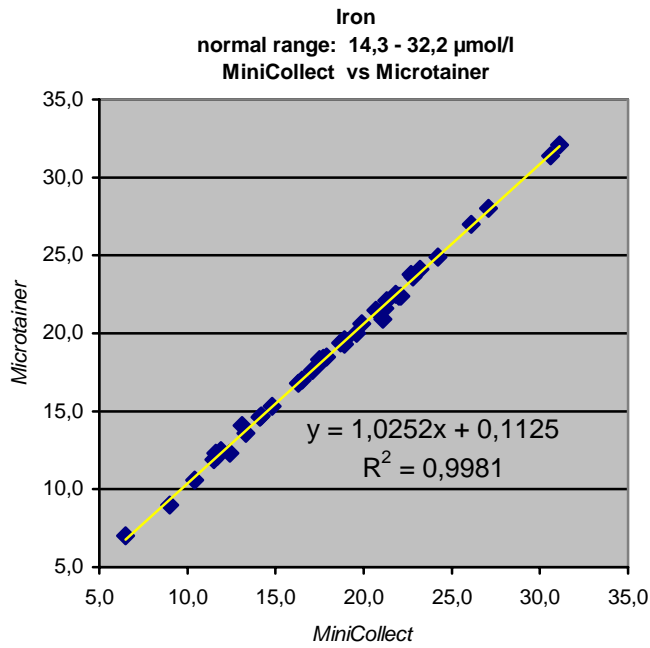
Phosphate
normal range: 0,77 - 1,45 mmol/l
MiniCollect vs Microtainer



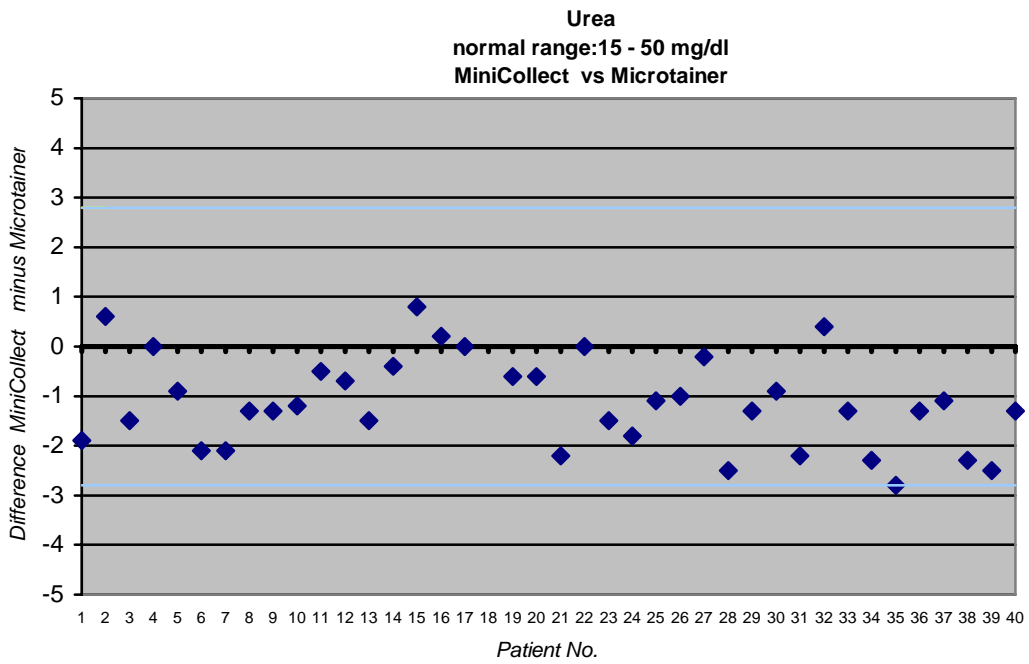
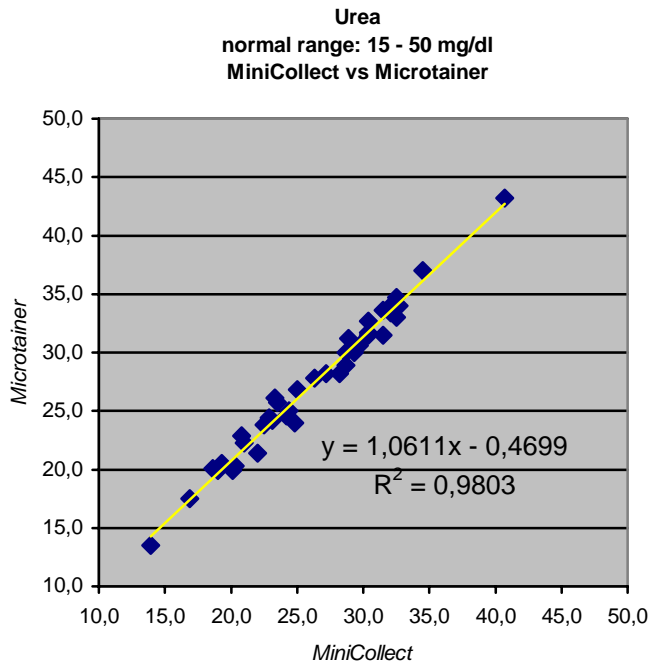
Magnesium



Iron

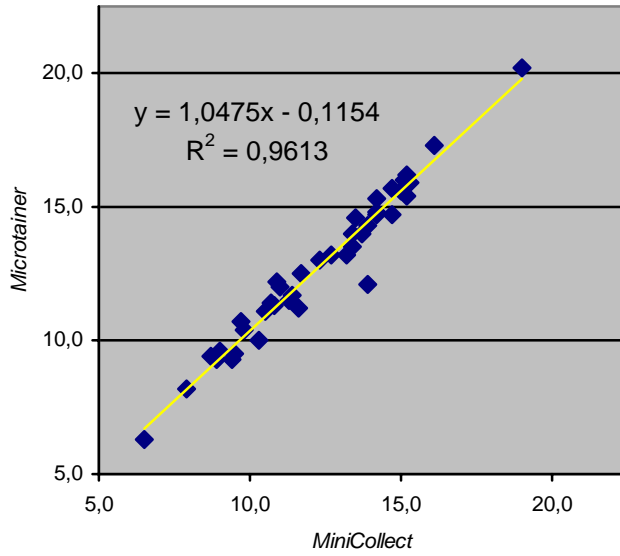


Urea

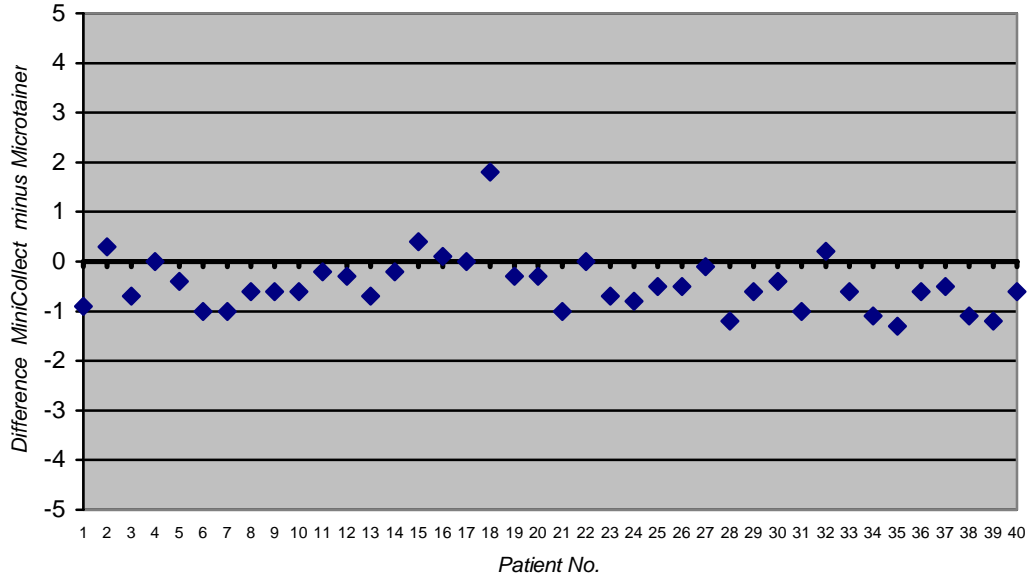


Blood Urea Nitrogen

Blood Urea Nitrogen
normal range: 7 – 23 mg/dl
MiniCollect vs Microtainer

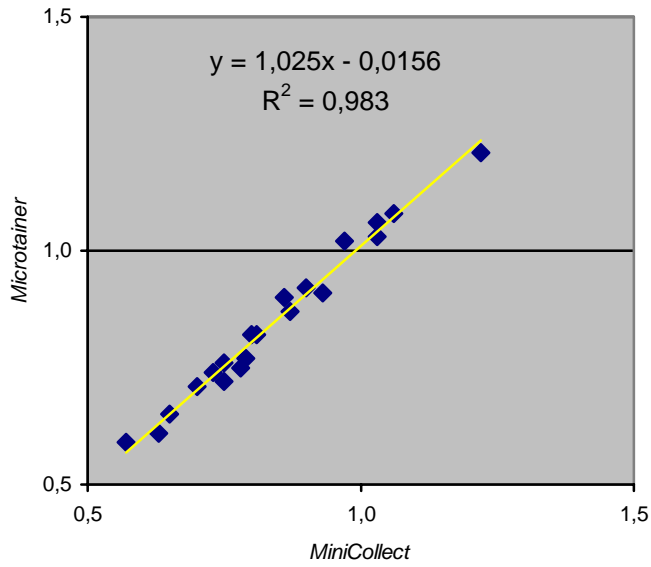


Blood Urea Nitrogen
normal range: 7 – 23 mg/dl
MiniCollect vs Microtainer

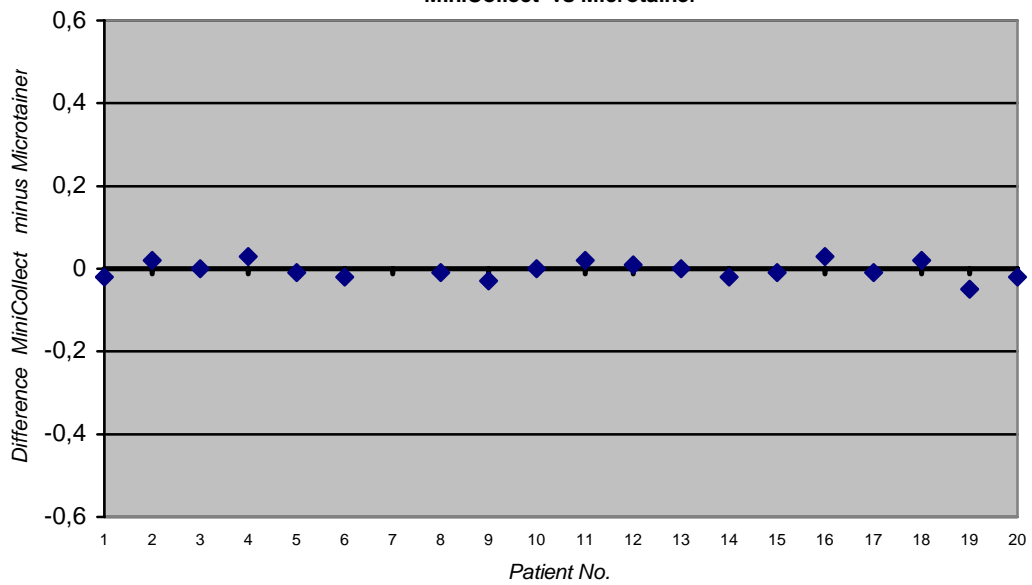


Creatinine

Creatinine
normal range: 0,55 - 1,1 mg/dl
MiniCollect vs Microtainer

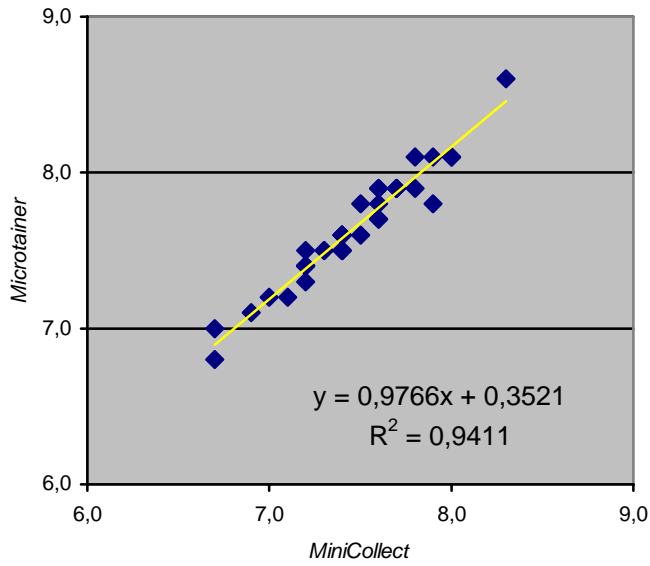


Creatinine
normal range: 0,55 - 1,1 mg/dl
MiniCollect vs Microtainer

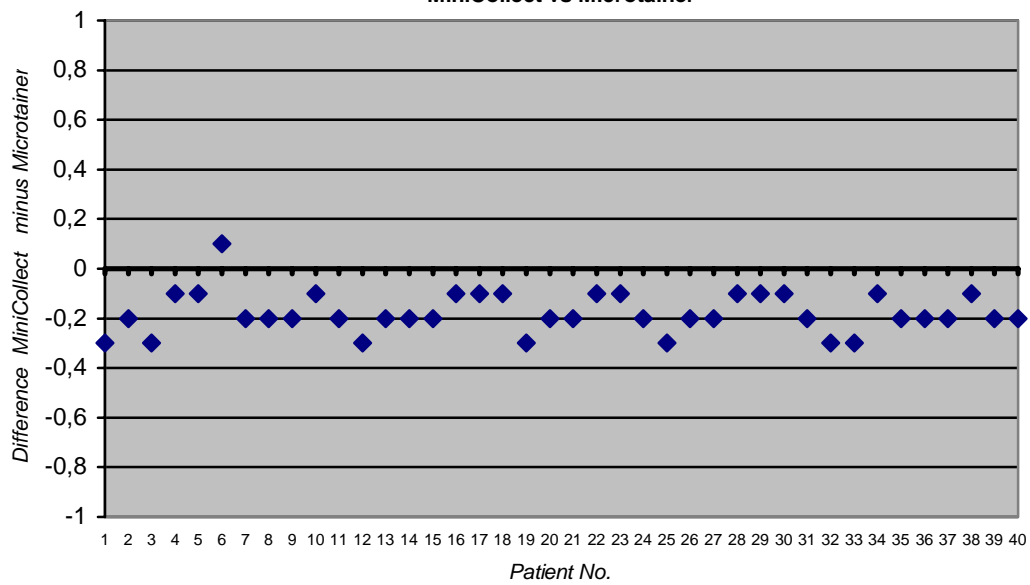


Total Protein

Total Protein
normal range: 6 - 8 g/dl
MiniCollect vs Microtainer

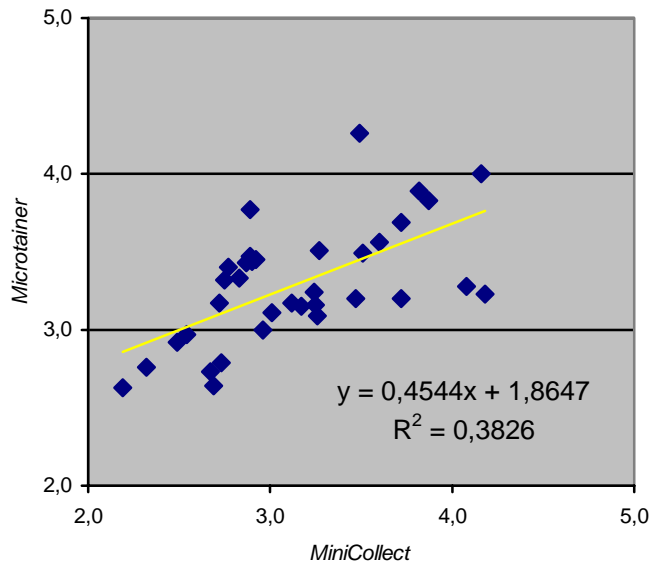


Total Protein
normal range: 6 - 8 g/dl
MiniCollect vs Microtainer

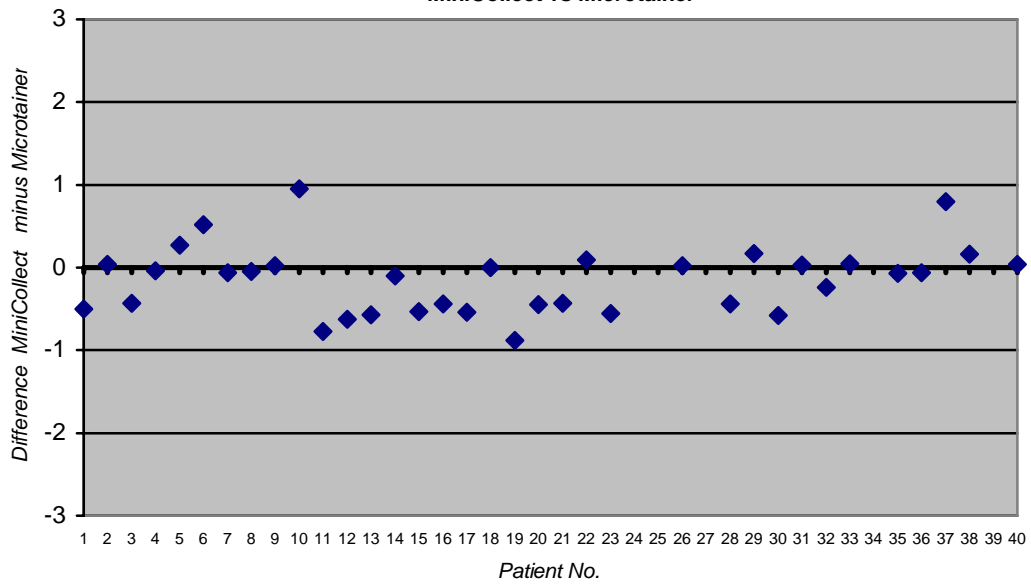


Free Triiodothyronine

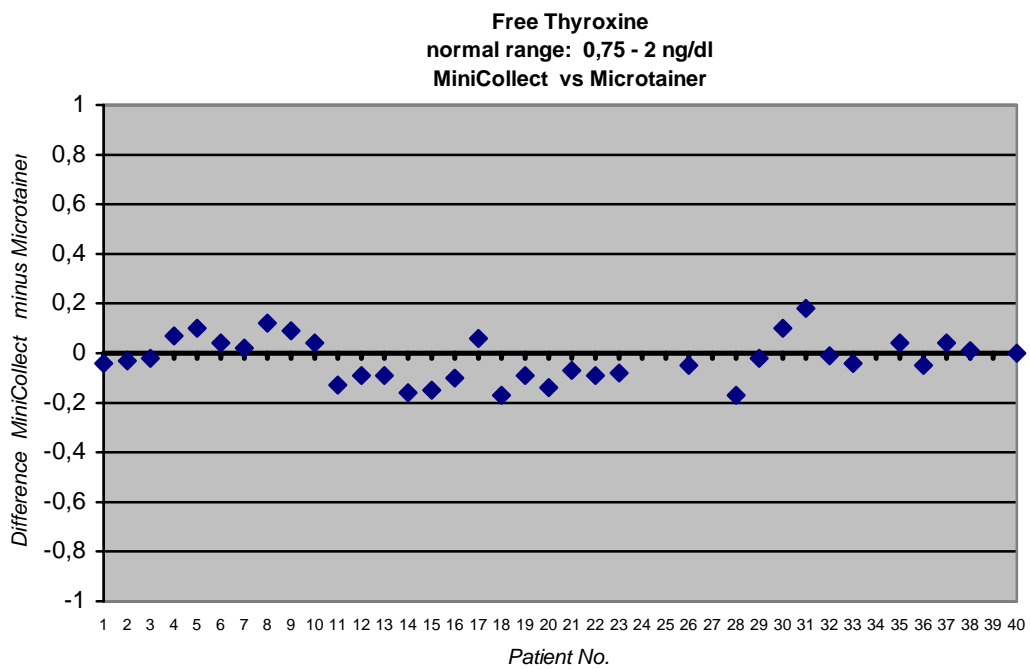
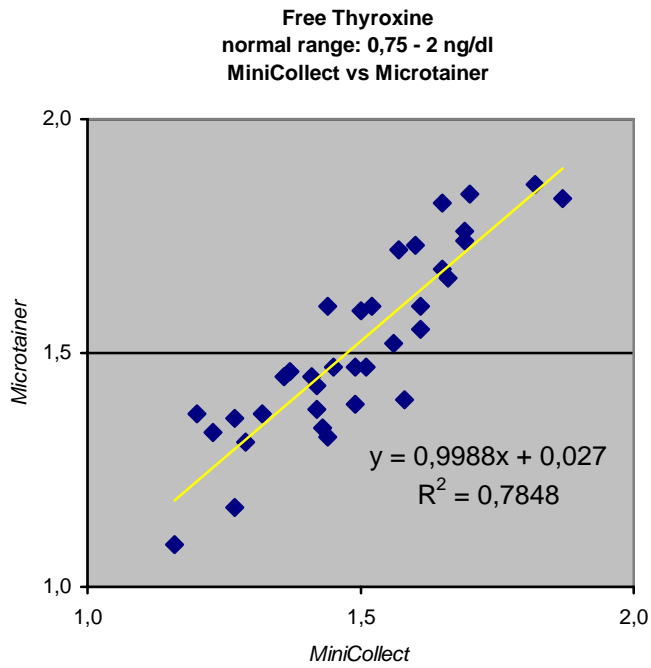
Free Triiodothyronine
normal range: 2,4 - 4,5 pg/ml
MiniCollect vs Microtainer



Free Triiodothyronine
normal range: 2,4-4,5 pg/ml
MiniCollect vs Microtainer

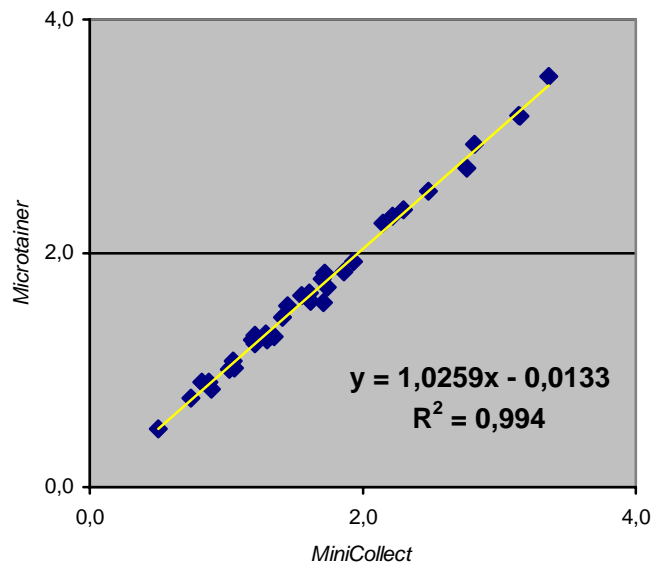


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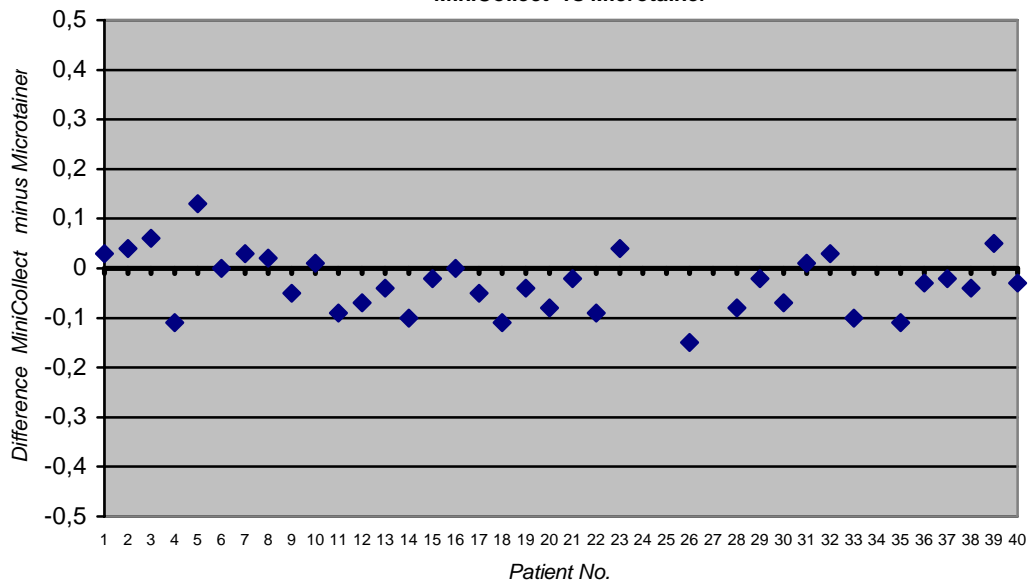


Thyroid-stimulating Hormone

Thyroid-stimulating Hormone
normal range: 0,47 - 3,5 μ U/mL
MiniCollect vs Microtainer

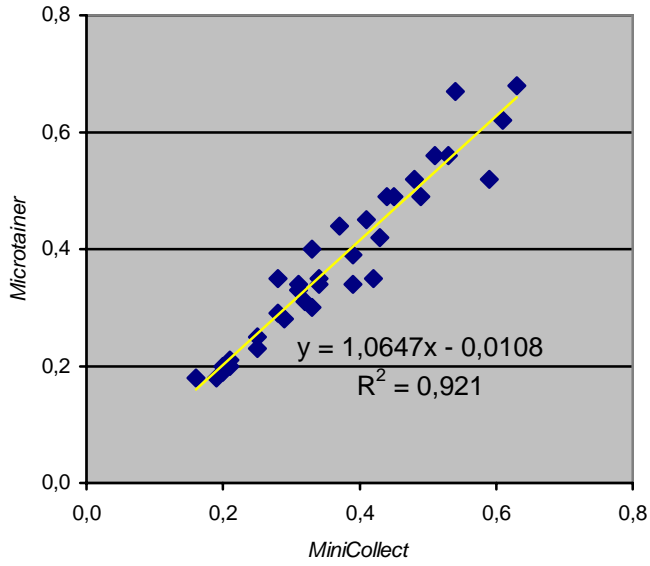


Thyroid-stimulating Hormone
normal range: 0,47 - 3,5 μ U/mL
MiniCollect vs Microtainer



Cortisol

Cortisol
normal range: 0,14-0,69 µmol/l
MiniCollect vs Microtainer



Cortisol
normal range: 0,14 - 0,69 µmol/l
MiniCollect vs Microtainer

