Creatinine level in capillary blood: a new tool for instant estimation of glomerular filtration rate at home or in ambulatory care settings.
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Monitoring of glomerular filtration rate (GFR) is essential for the management of patients with chronic kidney disease (CKD) from any cause. Whereas direct reference measurement methods using specific glomerular markers such as inulin are not readily available, GFR is usually estimated (eGFR) from serum creatinine level using estimation formulae such as MDRD or more recently CKD-EPI. For some patients reaching advanced stages of CKD, including transplanted patients, an accurate method for quick estimation of eGFR would improve the quality of monitoring and decrease the need of outpatient visits. A method of eGFR estimation using dipstick measurement of creatinine level in a capillary blood drop has been validated against inulin clearance, with a delta of 5ml/min/1.73 m2 which is deemed acceptable as compared to eGFR estimations by usual formulas using venous creatinine level (ASN Kidney Week 2015. Abstract # SA-PO195).

The purpose of this study was to assess if capillary measurement of serum creatinine using StatSensor device is precise enough to allow estimation of the rate of GFR decline on sequential measurements. It was designed to estimate sequential GFR values in a group of patients with a large range of renal function (CKD stages 1-5). The interval between 2 successive GFR estimations was at least 1 year. All 100 patients who were included in the previous validation study were informed on the new study, and accepted to participate. 30 patients included in the validation study (from 2013 to 2015) are expected to come to the nephrology department of the University Hospital to perform a second measurement. This measurement will be done simultaneously to each blood sampling performed for inulin clearance calculation and standard creatinine measurement. eGFR will be calculated using the formulae of Cockcroft & Gault, MDRD, and CKD-EPI, on the mean value of the capillary creatinine.

The GFR rate of decline estimated from capillary measurement of serum creatinine will be computed between the 2 timepoints and compared to the one computed on inulin clearance and from standard creatinine measurements. Comparison between measured and estimated GFR will be done using paired t-test, correlation analysis, and Band & Altmann plot.