

STANDARDIZATION OF SERUM CREATININE AND ESTIMATED GLOMERULAR FILTRATION RATE IN THE NATIONAL KIDNEY FOUNDATION KIDNEY EARLY EVALUATION PROGRAM (KEEP)

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Creatinine calibration by clinical laboratories is important, as variability among assays adversely affects the accuracy of glomerular filtration rate (GFR) estimation. We describe the calibration of creatinine assays used in the Kidney Early Evaluation Program (KEEP).

Creatinine values were requested for 200 samples at each of the 2 KEEP laboratories, Satellite (2000-2005) and Clinical Laboratory Services (CLS) (2005-present), for comparison with samples at the Cleveland Clinic Research Laboratory (CCRL). Linear regression and Deming regression were used to obtain slopes adjusted for measurement error and regression to the mean.

After exclusion of outliers, mean creatinine in 184 samples was 0.94 mg/dL at Satellite, compared with 0.89 mg/dL at CCRL. Linear regression revealed a slope of 1.003 (standard error [SE] 0.009), intercept -0.04 (SE 0.0097) with $R^2 = 0.9853$. Final calibration consists of intercept alone due to small slope. After exclusion of outliers, mean creatinine in 199 samples was 1.06 at CLS compared with 0.96 at CCRL. Linear regression revealed a slope of 1.08 (SE 0.005), intercept -0.18 (SE 0.0071) with $R^2 = 0.9939$. GFR estimates were minimally affected by the Satellite calibration. Before calibration, CLS overestimated GFR, increasingly marked at higher GFR levels.

Calibration of KEEP creatinine measurements had a greater impact on the current laboratory than on the laboratory previously used. The calibration process has worked to reduce overestimation of eGFR at the high range and reduce misclassification bias.