

# Improved Prediction Equations The CKD-EPI Project

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# CKD-EPI Project Aims

- Improve estimation equations for glomerular filtration rate from serum creatinine
- Develop and validate estimation equations for GFR from serum cystatin
- Assess utility of proteinuria and albuminuria as risk factors for progression of CKD

# CKD-EPI Participants

- Tufts - New England Medical Center: Data coordination and analysis. A Levey, et al.
- Johns Hopkins - Creatinine calibration coordination - J Coresh & J Marsh
- Cleveland Clinic Foundation - Laboratory analyses and statistical tools development - F. Van Lente & T. Greene
- Univ. Pennsylvania - H. Feldman - CRIC

# Prediction Equation Study Design

- Maximize number of subjects with reliable measurement of glomerular filtration - investigate pooling data bases
- Improve representation of diabetics and normal subjects in prediction models
- Standardize creatinine measures to IDMS
- Re-evaluate statistical tools for equation development

# CKD - EPI Data Pools

## CKD - EPI Data Pooling Studies

**MDRD DCCT CSG AASK DRDS CCFR MAYOR**

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**Number of Creatinine/GFR Data Pairs**

1795    1378    407    1846    203    1494    1081

Total measures = 8204

# The Instrument



AASK Core  
Lab  
CX3Delta

## The “Legacy”

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1987 MDRD: Astra 8

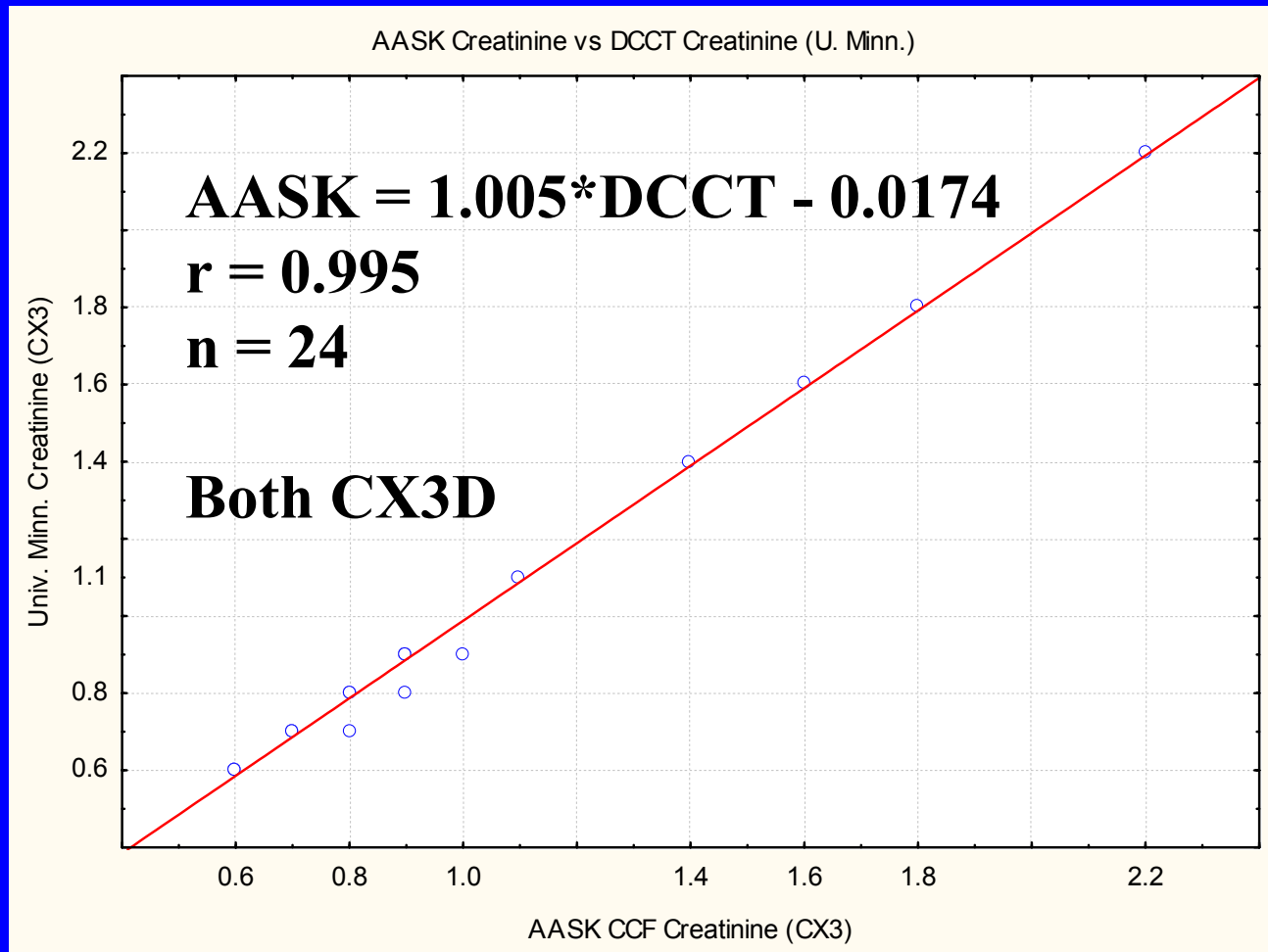
1994 AASK: CX3

1996 AASK: CX3Delta

# CKD-EPI Creatinine Calibration

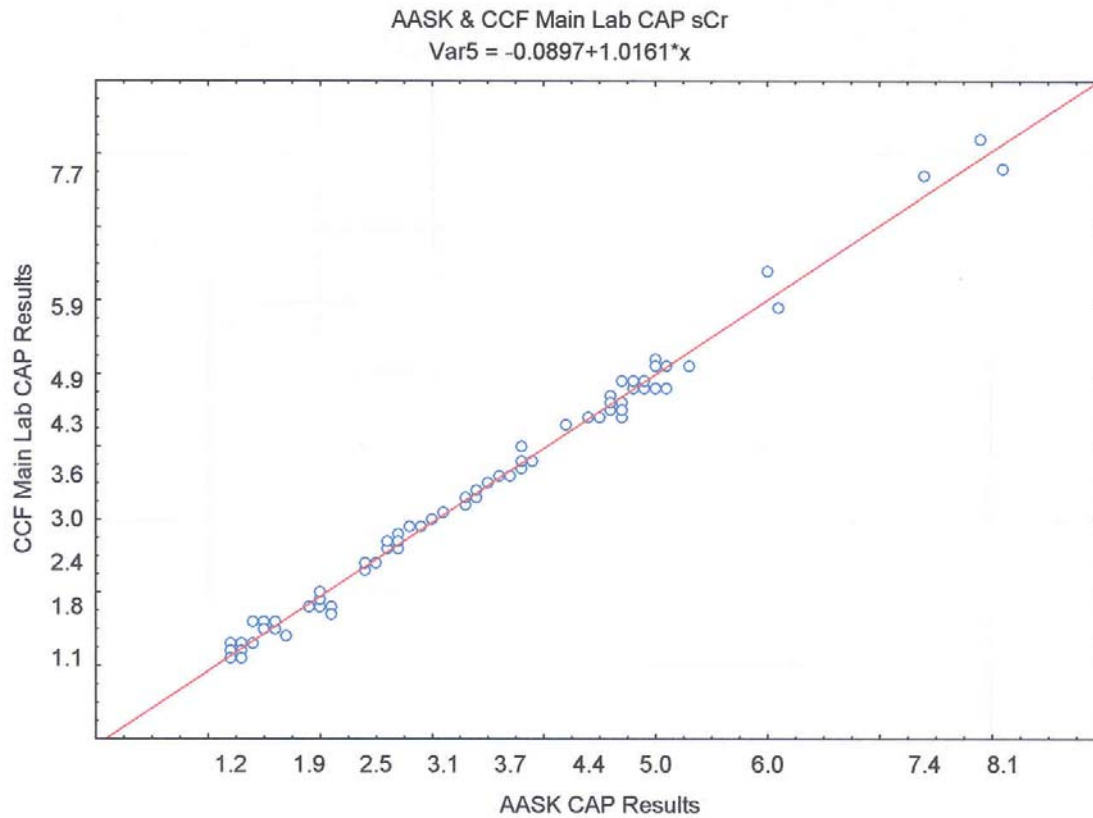
- Primary calibration using stored serum specimens if available
- Secondary calibration using frozen sera calibration set if method still operational
- Tertiary calibration using CAP Proficiency data

# Calibration Example - DCCT





# Calibration Example - CCF



# CKD-EPI Creatinine Calibration

- AASK Core Lab Synchron CX3 Delta method calibrated to CAP 2003 Frozen Serum, Creatinine = 0.90 mg/dL
- Member studies frozen sera sets analyzed by CX3 and a “combined” calibration equation derived.

# CKD-EPI Creatinine Calibration

- Member studies employing the frozen sera calibration set can be calibrated directly using the regression equation.

# CKD-EPI Work Product

Improved data prediction equation(s) using either serum creatinine alone or serum creatinine combined with serum cystatin. The serum creatinine measures will be all standardized to the IDMS target(s) thus allowing for maximum accuracy of prediction for any method standardized to the National Standard.