Evaluation of a Slide-Based Urine Magnesium Assay on the Vitros 5600

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A slide-based urine magnesium (UM) assay was evaluated at the Veterans Affairs Medical Center (VAMC)–Memphis using our Vitros 5600 (V5600) chemistry analyzer (Ortho, Rochester, NY). Twenty-five specimens were sent to the reference laboratory (RL); 23 were adequate to allow for comparative analysis. In-laboratory specimens were run on two analyzers and repeated on both analyzers after 24 hours stored at 4°C. Serial dilutions were performed on a high specimen (concentration > 20 mg/dL) and expected values were compared to measured values. Of the 23 specimens that were analyzed in-laboratory (Y) and at the RL (X), 5 were assayed as less than the LOD either by in-house assay (n = 3) or both assays (n = 2). Data on the 18 remaining specimens were analyzed using Deming regression (DR) and EP Evaluator software with these results (95% CIs): slope = 1.08 (1.01 to 1.14), y-intercept = -1.17 (-1.68 to - .65) and R² = .987. Using replicate patient samples, median total imprecision was 5.1% (range 1.7 to 11.5% [n=25]) while median inter-instrument coefficient of variation (CV) was 1.55% (range 0 to 6.15% [n=25]). Within-day, within-instrument imprecision using QC material (n = 20) was 1.0%. No obvious relationship between CV and mean concentration was apparent. Serial dilution of a specimen with neat concentration of 20.7 mg/dL had a minimum recovery of 89.8% at an expected concentration of 2.07 mg/dL. The UM assay performance was satisfactory for its use in the production environment over the range of 2-22 mg/dL. Although the 95% CIs suggested slope and y-intercept different from 0 and 1 respectively, the possible bias was in opposite directions and unlikely to have clinical significance. Reference intervals (RIs) depend not only on methodology but also on intake, time of collection and renal function. Using information from the RI of the RL and our DR, we adopted a random urine reference interval of 4-8.5 mg/dL and a 24-hour RI of 70-120 mg/day pending additional data collection.