

## GFR viewed as good indicator of early kidney disease

*In the last 20 years, the incidence of end-stage kidney disease in the U.S. has quadrupled. Because kidney disease often can be treated if caught early, such detection is an important public health goal. Estimated glomerular filtration rate (GFR) generally is viewed as a useful screening test for kidney function.*



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**H**eat disease and stroke rates have declined dramatically during the past 20 years, related largely to hypertension intervention and cholesterol education programs sponsored by NIH. Likely driven by the epidemic of obesity and diabetes, renal disease is increasing by 10 or 15 percent per year, thus becoming an even larger health care issue and financial burden on the health care system.

### Screening for kidney function with estimated GFR

GFR is calculated using the patient's serum creatinine

level. Fairview Laboratories began reporting calculated GFR with every creatinine result in 2003, based on recommendations by the National Institutes of Health's National Kidney Disease Education Program and the Kidney Disease Outcomes Quality Initiative.

GFR offers two advantages over creatinine alone. Even patients with significant loss of kidney function show very small changes in creatinine, making such loss difficult to recognize in the early stages. Also, because GFR accounts for age, sex and race, it provides a better interpretation of creatinine.

### Early detection to avoid dialysis and transplant

Primary care and general internal medicine physicians play an important role in early detection of renal disease. We recognize that adding one more preventive health issue to discuss with patients is difficult, but if the goal is to prevent renal disease from progressing to the point at which the patient needs a transplant or dialysis, we believe it's a worthy topic. Even if we can slow the progression before patients end up at stage four, with GFRs in the 20s, it would help. Once their GFR is below 20 mL/min/1.73 m<sup>2</sup>, patients

will need long-term dialysis or a kidney transplant to survive.

### Challenges to interpreting the GFR

The element of medical judgment is more critical with estimated GFR because the equations used to calculate it are not applicable to every patient. For children, adults older than 70, pregnant women, acutely ill hospital patients and those who have acute renal failure—estimated GFR calculations may not be suitable.

Trained athletes or body builders, who have a lot of muscle mass relative to their

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## Lab switches to qCMV

In February, the Clinical Virology Laboratory switched from shell vial culture to real-time quantitative PCR for identification of CMV (qCMV) in samples other than blood. We have tested blood samples by qCMV for nearly a year, with rapid turn-around-time and accurate results. Preliminary parallel experiments have shown excellent qualitative correlation of shell vial culture with qCMV in urine and in bronchoalveolar lavage specimens.

One advantage of qCMV is that it is truly quantitative, while shell vial culture is not. Moreover, qCMV possibly provides improved sensitivity, although more data are

necessary. We do not yet have enough experience with tissue specimens to report results at this time; therefore, to obtain correlation data to validate our method, we will send specimens to the ARUP reference laboratory in addition to testing them here. We welcome your comments or concerns regarding the change in CMV assays.

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## Measuring D-dimer to evaluate thromboembolism

D-dimer is a specific marker of the breakdown of a cross-linked fibrin clot (i.e., fibrinolysis) and an indirect marker of clot formation. D-dimer is elevated in venous thromboembolism (VTE), including deep vein thrombosis (DVT) and pulmonary embolism (PE).

The D-dimer measured by the Fairview Laboratories has been validated by its manufacturer, Diagnostica Stago, for use in evaluating deep vein thrombosis and pulmonary embolism. The possibility that a patient is

having an active venous thrombosis or pulmonary embolism is effectively excluded when the D-dimer is less than 0.6 ug/mL. The reference range for D-dimer is 0.0–0.5 ug/mL in healthy individuals.

D-dimer is highly sensitive and has a negative predictive value for DVT.

Thus a D-dimer of less than 0.6 ug/mL, in conjunction with a negative venous compression ultrasonography (CUS), reliably excludes the diagnosis of DVT—thereby obviating the need for additional CUS testing.

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body size, also tend to have misleadingly low estimated GFR. Because the amount of muscle mass determines how much creatinine the body produces and thereby the steady state serum creatinine concentration, renal function looks much worse for such people than it is.

### Mandating GFR reporting

Despite recent interest in mandating the reporting of GFR, most clinical laboratory organizations have opposed or been neutral to a legislative approach. But they're not against the reporting of estimated GFR—they're just against legislation forcing laboratories to report it in every case in which a serum creatinine is measured.

While other, more accurate tests exist to measure renal function, they are much more costly and complicated. Serum creatinine is widely measured in routine primary care settings and estimated GFR is reasonably predictive of renal function. Most nephrologists agree that although universal estimated GFR reporting is not a perfect indicator of renal function, it's simple and cost-effective.

Testing will create some false-positives. But on the other hand, those with early chronic renal failure who receive early treatment might escape dialysis or a transplant.

### New standards in the future

Different manufacturers' instruments clearly have been giving different serum creatinine results. Now manufacturers are working to standardize serum creatinine measurements across laboratories nationally. To minimize variation in reporting, Fairview Laboratories have standardized instrumentation.

Fairview Laboratories will convert to the standardized creatinine measurement when manufacturers make it available. The International Federation of Clinical Chemistry and Laboratory Medicine is working on the standardization of cystatin C, which may be a more reliable marker of glomerular filtration.

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