Communications and Publications Division (CPD) of the IFCC
Editor: Katherina Psarra, MSc, PhD
Department of Immunology - Histocompatibility
Evangelismos Hospital, Athens, Greece
E-mail: enews@ifcc.org

International Federation of Clinical Chemistry and Laboratory Medicine

N° 10 – October 2019

UNIVANTS™
OF HEALTHCARE EXCELLENCE

Improving patient care through co-reporting eGFRs for personalized drug therapy

Moderate impaired renal function is asymptomatic. However, medical procedures such as drug therapy with nephrotoxic drugs pose a substantial risk to these patients. Therefore, patients with impaired renal function are at high risk for morbidity and mortality and can be associated with high costs, longer lengths of stay, and/or significant side effects of drug therapy. Accurate renal function testing in the hospital is pivotal to detect chronic kidney disease (CKD), avoid further damage to the kidneys, and to optimize pharmacological therapy. Current protocols for renal function testing such as estimated glomerular filtration rates (eGFR) estimation by Cockcroft-Gault, however, have been known to wrongly classify certain patients, leading to inappropriate drug dosing and poor outcomes.

An integrated clinical care team at Marienhospital in Stuttgart, Germany hypothesized that if they could optimize non-invasive renal function testing, they could improve pharmacological treatment and avoid further renal damage without consuming additional resources. A severe drawback of all current methods of eGFR is that patients may not closely resemble the population used to develop the estimation, leading to under or overestimations of GFR. Discrepancies therefore can exist between creatinine and cystatin c-based eGFRs based on patient muscle mass, age and other known conditions. This team hypothesized that dual reporting of eGFRs would enable care providers, including Pharmacists, Oncologists, Nephrologists and Clinical Pathologists to assess and optimize drug dosing for more personalized care.

The rationale for co-reporting more than one eGFR estimation was originally proposed by Andrew S. Levey and colleagues. They stated, "A single equation is unlikely to work equally well in all populations" (*Ann Intern Med*. 2009;150(9):604–612).

Approximately one third of the inpatients at Marienhospital have severely impaired renal function. Implementation of co-reporting eGFRs determined with both creatinine and cystatin c methods mitigated wrongful CKD classification and improved accuracy of CKD staging and drug dosing in 25% of the patients at Marienhospital. A cost-benefit analysis of this approach was performed in 606 patients treated with certain chemotherapeutic drugs. With parallel testing and dual-reporting, the eGFR-tailored dosing led to a cost avoidance of approximately $105,000 euros through reduction of chemotherapy drugs alone. In addition to the financials savings were health benefits for patients including the avoidance of unwanted side effects.

"This testing intervention can be introduced in clinical laboratories through laboratory information systems and/or middleware. The detection of patients with large discrepancies between creatinine-based eGFR and cystatin C-based eGFR can be automatically triggered, enabling dose adjustments to fit the needs of each patient." noted Orth.

This care initiative received honors of distinction for their measurably better healthcare performance, in association with the 2019 UNIVANTS of Healthcare Excellence Award program. More information about this project and/or about the UNIVANTS of Healthcare Excellence program can be found at: www.UnivantsHCE.com.

THREE KEY TAKEAWAYS:

1. Accurate estimates of GFR are crucial for optimal treatment of patients with chronic kidney disease.
2. Dual reporting of creatinine and cystatin-based estimates of GFR can improve the ability of clinical care providers to generate treatment plans tailored to individual patients.
3. Strategic use of LIS/middleware can lead to measurably better healthcare performance including increased patient wellness, increased patient safety, improved clinical satisfaction and reduced overall costs.