

CHEMICAL PATHOLOGY

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This edition of *CME* is devoted to chemical pathology, a speciality that straddles many disciplines, including biochemistry, physiology, pathology, molecular medicine and clinical medicine. Knowledge of these disciplines together with that of the chemistry and physics relevant to laboratory testing allows for an in-depth understanding of disease and the most appropriate manner of approaching a diagnostic workup.

Remarkable technical developments over the last few years have dramatically improved the turnaround times and breadth of the menu of available tests, thereby allowing clinicians to treat and manage patients more efficiently.

The dawning of the molecular era has resulted in genetic tests which were previously confined to research laboratories being made available on a routine basis in general chemistry laboratories. Recent strides in the field of chromatography have enabled laboratories to perform tests such as the measurement of immunosuppressants on a routine basis using the gold standard method of HPLC-MS/MS, an instrument that was previously used as a research tool only.

Point of care testing is a further great enhancement in the armoury of the clinical chemist. The science of dry chemistry has matured and developed significantly over the last few years, reaching a point where the high quality of tests is maintained on instruments that are very simple to operate, thus allowing non-laboratory staff to perform a wide range of biochemical tests at the patient's bedside. This development has proven to be of great value in intensive care units as well as emergency departments, where it is crucial to have a rapid turnaround of certain tests to aid in the diagnosis and management of critically ill patients. The provision of high-quality biochemical tests to the rural areas has always posed a challenge to chemical pathology laboratories in South Africa, and the advent of dry chemistry methods has gone some way to solving this problem.

As medical costs escalate, it has become essential that laboratory tests are used efficiently and effectively. It is therefore hoped that the current issue of this journal will update readers as to the most effective use of biochemical tests. It is anticipated that the elucidation of some of the pitfalls of performing these tests such as pre- and intra-analytical factors and interferences will improve the clinician's ability to interpret laboratory tests not only by assessing their relationship to the reference range provided, but also by evaluating whether they are appropriate for the specific clinical circumstances under consideration.

As tests performed in the chemical pathology laboratory relate to the entire spectrum of clinical practice, it is beyond the scope of this journal to cover even a small percentage of the range of pathologies. The articles in this journal were therefore selected to

cover a number of commonly occurring scenarios that have broad clinical applicability. These are summarised below.

Coronary artery disease is a major cause of mortality of South Africans of all racial groups. The early identification of a myocardial infarction is critical for patient management and prognosis. It is also very costly to admit all patients with suspected myocardial infarctions to intensive care units. The recent guidelines on the appropriate use of cardiac markers such as troponin and myoglobin, discussed in this issue, will assist clinicians in the diagnosis and management of these patients.

The article describing the appropriate use of thyroid function tests also elucidates some of the associated problems relating to the performance of these assays. It is hoped that a better understanding of the limitations of these tests will allow clinicians to use them more efficiently.

The escalation of the number of patients suffering from diabetes mellitus over the last few years has resulted in a significant number of patients developing chronic kidney disease. The article on the biochemical assessment of chronic renal disease provides the reader with the recent guidelines as set out by the National Kidney Foundation regarding the staging and biochemical assessment of patients with chronic kidney disease.

The review of water and electrolyte imbalances is aimed at reminding the clinician of a systematic approach to the diagnosis and management of these common but often life-threatening disorders.

The article on the investigation of short stature highlights the recent changes in the field of endocrinology as well as emphasising the role of the partnership between clinician and pathologist in making an accurate diagnosis in this often very difficult field.

Liver function tests are performed routinely. The review in this issue aims at illustrating the use of this profile of tests to make an accurate diagnosis of liver disease.

The HIV epidemic in South Africa has impacted significantly on our community. The recent government implementation of the ARV roll-out has proven to be life-saving to the majority of patients treated with these drugs. However, as with all medications, side-effects do occur and one of the life-threatening complications is the development of lactic acidosis. It is hoped that the review of this topic will alert physicians to its early diagnosis and management.

A sound working relationship and understanding between pathologists and clinicians is essential for the accurate and cost-effective diagnosis and management of patients. It is hoped that the articles in this issue of *CME* highlight the importance of this collaboration.