



**Business Manager: Dr Elizabeth Samuel**

The Academic Complex Business Unit, based at Inkosi Albert Luthuli Central Hospital and King Edward VIII Hospital, comprises five departments and services eight diagnostic laboratories. It is the tertiary referral centre for the KwaZulu-Natal region and fulfils the NHLS mandate of research, diagnostics, teaching and training. The NHLS departments share joint status with the University of KwaZulu-Natal.

## Department of Anatomical Pathology

**Head: Prof PK Ramdial**

### Diagnostic services

The Department of Anatomical Pathology reported on 32,290 surgical pathology, 88,894 cytopathology and 34 autopsy specimens. The cytopathology diagnostic service included 76,025 gynaecological and 12,869 non-gynaecological specimens, including fine needle aspirates. The main challenge for the department is shortages of pathologists and technologists.

### Teaching and training

#### Undergraduate

One hundred and four hours of lectures were delivered to undergraduate MBChB students. These included 23 lectures and three practicals to first year, 11 lectures and nine practicals to second year and six lectures to third year medical students at the Nelson R Mandela School of Medicine. The department was also involved in the end of theme and end of module assessments for the first, second and third years.

Undergraduate curriculum revision, under the rubric of 'Curriculum 2010' began in 2009. Anatomical Pathology involvement will be contained in the Foundation Basic Science component.

#### Postgraduate

The Health Professions Council of South Africa accredited the department for postgraduate registrar training and has allowed a pathologist to registrar ratio of 3:1 for future years. During the year, 37 clinicopathological meetings were undertaken with the clinical and surgical disciplines that allowed interaction with clinical colleagues and contributed to improved understanding of disease processes in general, and helped with management of individual patients in particular. The postgraduate training programme facilitated learning and intradepartmental interaction at 19 journal clubs, 10 seminars, 10 short topics, four post mortem seminars and 31 'box' slide assessments.

#### Medical technologists

Two technologists passed the Professional Board Examination in histopathological techniques. Three cytotechnologists passed the Professional Board Examinations, two with distinction. One technologist graduated with an MMedSci.

### Honours

Dr J Deonarain was awarded the prize for the best poster presentation for his presentation on 'Tuberculous abscess: Does it exist? A histopathological verdict.'

## Research output

Published publications: 9  
Conference presentations:  
National: 14

## Professional development

Postgraduate candidates graduated: 1 (FCPath (Anat))  
Postgraduate candidates enrolled: 5 (FCPath (Anat))

## Department of Chemical Pathology

*Acting head:* **Dr Prebashni Naidoo**

## Diagnostic services

In addition to its service delivery to King Edward VIII and Inkosi Albert Luthuli Central Hospital (IALCH), the Department of Chemical Pathology serves as a referral chromatography laboratory for KwaZulu-Natal, providing specialised testing in endocrinology and electrophoresis. Currently, IALCH is the national referral centre for very long chain fatty acid analysis. This is of particular significance in paediatric metabolic disorders.

## Research projects

### **Assessing the effect of different transport conditions on the measurement of plasma lactate and glucose**

*Investigators:* Dr D Govender, Dr P Naidoo, Mr MZ Warasally

The aim of the investigations was to standardise procedure with regard to transport conditions of plasma lactate and glucose. Statistically significant differences were seen for lactate samples at the 30 minute and 120 minute intervals for samples kept at room temperature compared to those kept on ice in a mixed cohort of both healthy and intensive care patients. There was no significant variation noted in glucose levels, irrespective of time to analysis and transport condition.

### **Effect of pH and temperature on the assay of urine catecholamines by HPLC-electrochemical detection, in the diagnosis of pheochromocytoma**

*Researchers:* Dr Prisha Naidoo, Dr Prebashini Naidoo, Mr MZ Warasally

The study aimed to determine firstly if different urine pH levels and storage conditions significantly affect catecholamine results, and secondly if the laboratory protocol for the urine catecholamines assay needs to be amended. The findings suggest the need to reject fewer samples and amend the current laboratory protocol to accept urine samples up to pH 4 for catecholamine assay.

### **A clinical and laboratory analysis of the lipid status of patients at a tertiary hospital in KwaZulu-Natal**

*Researchers:* Mr MZ Warasally, Dr Prebashini Naidoo, Dr D Govender, Dr Prisha Naidoo, Ms S Nagesur

This study aims to establish lipid patterns in a tertiary hospital and to establish if there are gender and ethnic differences present. The impact of the lipid profile on laboratory decisions, such as the need for ultracentrifugation is being investigated as well as the use of guidelines to risk-stratify patients. The pre-analytical macroscopic findings of lipaemic samples amongst multiple laboratory personnel are being compared.

## Teaching and training

### **Undergraduate**

The department contributes to the medical students' curriculum, namely large group resource sessions, facilitation and result interpretative skills.

### **Postgraduate**

A comprehensive training programme spanning the practical and theoretical aspects of chemical pathology is presented.

An intern scientist training curriculum has been developed and has received accreditation from the Health Professions Council of South Africa.

## Honours

Mr MZ Warasally was awarded his MSc with distinction from the University of KwaZulu-Natal.

## Research output

Publications published: 1

## Professional development

Postgraduate candidates enrolled: 2 (MMed)

## Department of Haematology

Head: **Prof Vinod Jogessar**

### Diagnostic services

The haematology laboratory at the Inkosi Albert Luthuli Central Hospital (IALCH) provides services to the whole of KwaZulu-Natal and the northern part of the Eastern Cape. Divisions within the haematology laboratory are routine haematology, immunocytochemistry, immunophenotyping (flowcytometry), specialised coagulation, haematological cytogenetics, fluorescence *in situ* hybridisation, molecular haematology and immunology. The laboratory provides a 24-hour service. The total number of tests performed during 2008 was 446,319, averaging 37,193 per month. Being an accredited training institution, training is given to pathology registrars, medical scientists, medical technologists, medical technicians, medical students and undergraduate science students.

The haematology laboratory at King Edward VIII Hospital provides secondary and tertiary level services. During 2008, 239,377 tests were performed, an average of 19,948 per month.

### Clinical services

Six and three haematology clinics per week are conducted at IALCH and King Edward, respectively.

At IALCH, 3,250 patients were seen during the year. The haematology ward has 13 beds with an occupancy rate of close to 100%. The recently commissioned bone marrow transplant ward has five beds. To date, five autologous stem cell infusions have been performed.

At King Edward, 9,259 patients were seen during the year in the outpatients' department. The daily in-patient number averages 15 patients.

## Department of Medical Microbiology

Acting head: **Prof Yacoob Coovadia**

### Diagnostic services

The routine microbiology laboratory receives on average 7,000 specimens per month. The tuberculosis laboratory, which is the only culture and susceptibility facility in KwaZulu-Natal, processes about 15,000 specimens for microscopy and culture monthly. This laboratory was involved in the validation of the Hain's MTBDR plus test. The department extended its diagnostic and consultative service to Mahatma Gandhi Memorial Hospital from June 2008. It has also embarked on an outreach programme to Ngwelezane Hospital. This has taken the form of video conferences, laboratory visits and meetings with management of the hospital.

### Research projects

- Analysis of antibiogram for common isolates from surgical intensive care unit at a tertiary hospital in Durban  
*Researchers:* Dr K Swe Swe/Han, Prof Y Coovadia
- The significance of *Acinetobacter* spp infections in an intensive care unit in 2008  
*Researchers:* T Ibrahim, K Swe Swe/Han, Y Coovadia, D Gopalan, D Singh
- The identification and speciation of non-tuberculous mycobacteria in KwaZulu-Natal  
*Researchers:* L Sookan, Y Coovadia
- The susceptibility profile and genotypic characterisation of *Mycobacterium tuberculosis* in Maputo, Mozambique  
*Researchers:* L Latifo, P Moodley, AW Sturm
- The investigation of an outbreak of food-borne disease in rural South Africa

*Researchers:* A Niehaus, YM Coovadia, P Moodley

- An evaluation of real-time PCR for the identification of the aetiological agents of atypical pneumonia, and the detection of cytokines as markers for pneumonia, in bronchoalveolar specimens from neonates in KwaZulu-Natal

*Researchers:* L Bohlken, Y Coovadia

- Evaluation of discordant results between phenotypic drug susceptibility testing and rapid genotype MTBDR<sup>+</sup> Assays for the detection of rifampicin and isoniazid resistance in sputum specimens received from patients in high TB burden areas within KwaZulu-Natal

*Researchers:* M Pillay, Y Coovadia

### Teaching and training

The department conducted 100 continuing professional development-accredited intradepartmental meetings and 45 interdepartmental meetings.

#### Undergraduate

Registrars and consultants are involved in lectures, practicals and workshops to undergraduate medical students as well as biomedical science and clinical science students.

#### Postgraduate

The department conducted the FCPATH(Micro) examinations in September 2008; five candidates were examined and four passed. There are currently eight registrars: two junior and six senior. In addition, two infectious disease specialists, who spent three months in the laboratory, were trained.

#### Medical technologists/technicians

The department currently employs and trains 13 student medical technologists and technicians enrolled.

### Research output

Published publications: 2

Congress presentations:

National: 1

### Professional development

Postgraduates candidates: 4

## Department of Virology

*Acting head:* **Dr Pravi Moodley**

### Diagnostic services

The fully automated Roche Cobas Ampliprep-TaqMan was implemented for HIV DNA polymerase chain reaction (PCR) testing in infants. A total of 68,000 HIV PCR tests were performed compared to the 40,980 in 2007/08.

The department performed about 206,000 (162,414 in 2007 and 96,000 in 2006) HIV-1 viral loads and 86,152 (80,550 in 2007 and 80,000 in 2006) CD4 counts for the KwaZulu-Natal Department of Health's Comprehensive Care, Management and Treatment Programme.

About 178,523 ELISA (136,370 in 2007) assays were performed for various HIV, hepatitis A virus, hepatitis B virus, hepatitis C virus, rubella, cytomegalovirus, Epstein-Barr virus, herpes simplex virus 1/2 and Toxoplasma serological markers.

About 4,204 (7,767 in 2007) viral isolation assays were performed for various viruses in cell culture. About 6,303 (4,717 in 2007 and 4,600 in 2006) PCR assays were performed for various viruses using optimised in-house techniques based on published methods.

### Research projects

- HIV threshold resistance survey

*Researchers:* Dr M Gordon, Dr R Parboosing, Miss AF Naidoo

*Collaborators:* Dr V Vella (Italian Co-operation), Prof Myra Taylor (University of KwaZulu-Natal)

*Funding:* Italian Co-operation

This survey, based on the WHO surveillance protocol, will determine if a threshold of 5% of transmitted drug-resistant HIV has been breached in a treatment-naïve population.

- Interaction between chronic viral hepatitis co-infection and HIV-associated immune reconstitution inflammatory syndrome  
*Researchers:* Dr R Parboosing, Dr P Moodley  
*Collaborators:* Dr L Haddow and Prof P Easterbrook (King's College Medical School, London), Prof MYS Moosa (Department of Infectious Diseases, Nelson R Mandela School of Medicine (NRMSM)), Prof T Ndung'u (Doris Duke Medical Research Institute, NRMSM)  
*Funding:* Medical Research Council (MRC), NHLS Research Trust
- Antiviral susceptibility testing for anti-HIV compounds  
*Researchers:* Dr R Parboosing, Miss AF Naidoo  
*Funding:* MRC, NHLS Research Trust  
*Collaborators:* Prof Gqaleni, Dr Du Toit (University of KwaZulu-Natal)
- Anti-infective compounds from South African plants  
*Researchers:* Miss AF Naidoo, Dr R Parboosing  
*Collaborator:* Prof F R van Heerden (Department of Chemistry)  
*Funding:* MRC  
High throughput *in vitro* cytotoxicity and antiviral assays are performed on compounds or plant and natural extracts to assess their potential anti-HIV effect.
- Surveillance for dual HIV infection in patients on the antiretroviral rollout programme  
*Researchers:* Miss A Naidoo, Dr R Parboosing, Dr M Gordon  
*Funding:* MRC, NHLS Research Trust
- Design, synthesis and high-throughput *in vitro* evaluation of peptides with potential anti-HIV activity  
*Researchers:* Dr R Parboosing, Miss AF Naidoo  
*Collaborators:* Prof HG Kruger, Dr T Govender (Department of Chemistry, University of KwaZulu-Natal)  
This study involves design, synthesis, quantitative structure-activity analysis, and high throughput cytotoxicity screening of synthetic peptides with potential anti-HIV activity.
- The molecular epidemiology of hepatitis C virus in KwaZulu-Natal  
*Researchers:* Dr R Parboosing, Miss AF Naidoo
- Responses to hepatitis B virus vaccination in patients on the KwaZulu-Natal antiretroviral rollout programme: implications for public health  
*Researchers:* Dr N Tathiah, Dr R Parboosing  
*Funding:* NHLS Research Trust
- Zidovudine resistance in pregnant patients enrolled in the dual therapy arm of the Prevention of Mother-To-Child Treatment Programme at Addington Hospital, KwaZulu-Natal  
*Researchers:* Dr R Maharaj, Dr R Parboosing  
*Collaborators:* Miss AF Naidoo, Dr P Moodley, Dr R Paredes

## Teaching and training

### Undergraduate

The department has been offering a 16-credit module, Molecular Virology, BSc( Biomedical Science) at third-year level in the Faculty of Science since 2002. The average number of students per year is 30 with an annual pass rate of 100%. There are currently 15 students registered.

The contribution to the medical student teaching includes lectures and assessments in modules such as infection and inflammation, people and bugs, and abdominal complaints and jaundice in the first three years of the curriculum.

### Postgraduate

Three registrars were appointed during the past year.

One hundred and twenty students were lectured in the module 'Introduction to the virology of HIV' towards the postgraduate Diploma in HIV/AIDS Clinical Management 2009 via Telemedicine in collaboration with Nelson R Mandela School of Medicine's Enhancing Care Initiative Unit.

The department was visited by the Health Professions Council of South Africa for accreditation of training of registrars and intern medical scientists. Certification is awaited.

**Medical technologists/technicians**

Five student technologists passed the SMLTSA Board Examinations in Virology during the year. One student technician passed. He is one of four students nationally who attempted this examination for the first time. The results of five student technologists who wrote the March 2009 examination are awaited.

**Continuing professional development**

The department was involved in developing and implementing training material for numerous activities which included topics such as laboratory and surveillance aspects, post exposure prophylaxis and HIV infant diagnosis. These were delivered to a wide range of healthcare workers.

**Research output**

Publications published: 4

Conference presentations:

International: 1

**Professional development**

Postgraduate candidates graduated: 1 (MMed)