

## LABORATORY CAPACITY BUILDING

Another visit by Motec in June 2007 has successfully been completed. I had opportunity this time to work at both Koforidua St Joseph's Hospital with the team headed by Mr Paul Ofori-Atta, the organisations president, and also at Nkawkaw Holy Family Hospital, headed by Mr S.P.Raymond.

The goal for Motec-life UK for the Pathology Laboratory is simple. To expand and develop the microbiology section to come closer to meeting international standards. This will include providing facilities for culturing of a wide range of clinical specimens and for full identification of bacterial and fungal organisms. It is effectively a blank canvas on which to work especially at St. Josephs Hospital. Nkawkaw laboratory functions a lot better and well organised. The microbiology section though small, performs blood, urine, wound, CSF, and other miscellaneous cultures.

A few laboratory consumables we shipped failed to arrive on time at Koforidua so I confined myself to teaching safe laboratory practice to the staff during my week stay. Topics presented at both hospitals include 'TB a Global Change' and 'The Challenges of Antibiotic Resistance'

TB is a major opportunistic infection among persons with AIDS, and laboratory support for TB management and prevention is essential. Early detection and treatment of TB and STI's along with routine public health surveillance are vital components of a comprehensive HIV control and prevention programme. There was sufficient evidence at either hospital that this was practiced. Nkawkaw hospital has analyser to determine CD3/CD4 levels for the purpose of treating HIV patients with antiretroviral therapy. My time at Nkawkaw was spent training staff in microbiological culture procedures.

Lack of technical facilities to support diagnostic and curative medicine discourages doctors from providing rural health care. In Ghana, therefore, medical assistance often makes the first decision on most health problems. And this is the same at both Koforidua and Nkawkaw. Such staffs, in conducting basic community medicine, send patients to the lab for appropriate investigations. Simple tests requested by the medical assistance themselves can assist in routine surveillance, in establishing priorities of medical care and in systematizing referrals to health centres. The finding of fever and examination of a blood film may reveal acute bacterial infection, malaria or relapsing fever. Blood haemoglobin results may indicate malnutrition, malaria, hookworm, bilharzias, and thus be followed up by a thin blood film, or tests for sickle cell and stool hookworm ova, pus cells or amoeba. The repertoire of simple laboratory investigations is largely completed by examination of sputum for acid-fast bacilli, or diplococci; by urine microscopy, with haematuria; and tests for protein or sugar, in cases of oedema or polyuria. A limited range of more elaborate tests is available in the Nkawkaw hospital laboratory.

Human and technological factors, which bear on the modus operandi of the Koforidua or Nkawkaw laboratories, are identified and discussed.

Gross deficiencies were found in the knowledge, attitudes and practice of laboratory safety by laboratory staff in the areas of use of personal protective equipment, specimen collection and processing, centrifuge--related hazards, infective hazards waste disposal and provision and use of First Aid Kits.

It appeared to me that both employers and employees do not yet give issues pertaining to laboratory safety in this era of resurgence of diseases such as HIV/AIDS and Hepatitis B and C seriously.

The economic implications of safety precautions in laboratory practice make compliance difficult especially for laboratories in countries with poor economies. However, economic factors are not the only determinants of a safe work environment. The laboratory workers practised unsafe work practices such as eating or drinking in laboratories. Gloves and white coats are available but workers do not use gloves when handling biological samples. None of these workers used goggles or face shields in the course of their work. Accident records and first aid facilities were absent at either Koforidua or Nkawkaw laboratories. I had opportunity to visit the Regional Hospital Laboratory at Koforidua and my observation there was the same.

The commonest health problem reported by workers was low back pain. The poor coverage of hepatitis B immunization among the laboratory workers in an endemic area is currently a cause for concern. There is a need for education programmes to increase awareness on safety. Public health workers in this setting face the challenge of promoting safe work practices among workers in the face of the lack of funding and apathy among the workers.

### **Causes of Poor Pathology Services**

There are numerous causes of poor services in pathology laboratories, the primary one being failure to follow regulations, or in some cases, to develop relevant regulations. The reasons for this are many and varied, but professional pathologists and Technologists as a whole must share the responsibility for tolerating inefficient or flagrantly incorrect practices. The following factors are especially pertinent:

- *Low Budget.* In most developing countries like Ghana, health care is primarily funded from general government revenue with patients paying for medical treatment through the recently introduced health insurance. The expenditure on health is very low to begin with. It is, per capita, less than one quarter of what developed countries spend and often very much less. Moreover its distribution amongst the various sectors is inequitable. Most funding is spent on high-profile

projects in teaching institutions in large urban centres. Laboratory services do not command a high priority.

- *Scarcity of Laboratory Staff.* The tremendous progress in the field of laboratory medicine has made accurate assessment and monitoring the progress of an ailment much easier. The result has been a great surge in demand for pathology services. It is unfortunate that the availability of laboratory personnel has lagged far behind. In addition, there is significant migration of trained manpower to more lucrative markets abroad. There is no doubt that a huge gap exists between supply and demand.
- *Poor Training.* The training of technicians leaves much to be desired. Many technicians receive only on-the-job training, with little formal education. The quality of the work of such a body of inadequately trained personnel is bound to be substandard.
- *Lack of Appropriate Equipment and Infrastructure.* Laboratory equipment is mostly manufactured in industrialized countries. It has become increasingly more sophisticated. In Ghana there is no infrastructure for maintenance, or even an assured supply of electricity. It is therefore not surprising that some laboratory equipment is non-functional.
- *Lack of Regulatory Mechanisms.* There is no license required to establish a clinical laboratory in a developing country like Ghana. There are no rules or training requirements for non-pathologist physicians who run or lend their names to laboratories.
- *Lack of Continuing Education.* At present there is almost no provision for continuing education for laboratory workers. It is usually not required by the institutions that initially award them certificates/diplomas/degrees. The result is that most do not keep up with advances in the field. Yet in such a fast-moving area, it is important that laboratory workers remain up-to-date with ever-changing terminology and newer diagnostic tests.

### **Steps Necessary for Improvement**

A number of steps are required of governments as well as professional associations to improve to the current situation:

- *External Quality Assessment (EQA).* A system of EQA including laboratory licensure, accreditation, certification and proficiency testing has to be introduced to provide recognition to those who conform to acceptable standards. The current international requirements would perhaps be too stringent for the vast majority of existing labs including Nkawkaw and Koforidua. It may be necessary to evolve a system by which such laboratories are included in a simpler quality assurance program and are gradually brought up to international standards over a period of time.
- *Training greater numbers of qualified Laboratory Staff.* The supply of qualified laboratory workers can be increased by providing more

training opportunities both within Ghana and, in some cases, abroad (although this is more expensive and entails the risk of economic migration). Mr Samuel Numarfo of Holy Family Hospital could benefit from such training. It may be helpful to arrange short visits by foreign experts. The non-qualified laboratory workers can be trained to undertake limited pathology work by providing them with the necessary training.

- *Suitable Technologies*. There is a plethora of in vitro diagnostic devices available in more developed countries. Equipment and reagents appropriate to the needs of developing countries should be introduced.

The goal of Motec's improvement in pathology services in the selected hospitals will be a slow process and would involve a substantial financial investment. It is however imperative that a beginning is made so that the suffering of patients is reduced and proper and early diagnosis of infectious diseases, e.g. TB or HIV control is brought onto a more rational and firmer footing.

I am delighted to be part of motec's dedicated volunteers helping to improve the health of the life of the deprived people of Ghana.

The reader is requested to refer to Pathology at St Joseph's Report of February 2007.

**Ray Ofori, Laboratory Project Leader**