

Motec-Life Laboratory Report

**Presentation, Motec Life AGM
Hemel Hempstead, Hertfordshire, England**

By Raymond Ofori, 1st December 2007

The goal for Motec-life UK for the Pathology Laboratories in the targeted hospitals is to improve the microbiology services to come closer to meeting international standards and to help improve all other disciplines. This will include supporting facilities for culturing of a wide range of clinical specimen and for full identification of bacterial and fungal organisms.

An effective laboratory service is an essential part of a functional health service. Laboratories provide confirmatory diagnosis and improved management of disease, essential public health information and disease surveillance. Due to this wide-ranging role, laboratories are an important part of many disease control programmes; yet laboratory services are often ignored or taken for granted. This lack of awareness means that laboratory services have been under-resourced, poorly managed and rendered ineffective in many developing countries. Laboratories require a good logistical supply and utility services to be in place to function properly, something which is difficult to achieve even in urban population centres in Ghana. This makes the provision of laboratory services even more problematic and difficult to sustain in remote rural areas. In Ghana, along with many other developing countries, the greatest limiting factor on laboratory capacity is the availability of laboratory personnel.

Laboratory services should be developed to address the greatest needs within the community as a whole to allow them to operate within the above constraints. Ideally they should be part of an integrated health package to allow resources to be shared effectively.

Over the course of the year 2007, I have paid three working visits - February, June and October with the Motec dedicated team and have visited 4 hospitals within Ghana. These are Koforidua St Joseph's, Nkawka Holy Family, St John of God, Sefwi-Asafo and Pramso St Michael's Hospitals respectively.

Laboratory tests performed.

All the 4 hospital laboratories visited performs a limited range of tests to support diagnosis. With the exception of St Joseph's Koforidua, the other 3 labs have semi-automated analyzers for the performance of Haematological and biochemistry tests. e.g. Haemoglobin estimation, blood glucose measurement, Liver function and Kidney function tests

Blood Transfusion

An effective blood transfusion service is vital for many activities in the health service - from major surgery to treatment of severe anaemia in children. Screening blood for infection was identified as the most costly processes amongst the critical laboratory services, but an effective screening system is essential to reduce the risks of

transfusion-related infections due to the high prevalence of blood-borne disease in Ghana.

The transfusion sections at these hospitals are very busy, as patients are required to encourage relatives or friends to donate blood prior to any surgery. All donated blood is screened for HIV, Syphilis (rapid plasma reagin), Hepatitis B and Hepatitis C. Sefwi-Asafo and Pramso have counselling section for donors before they are bled. Nkawkaw and Koforidua lack such counselling facilities.

Malaria

Malaria is one of major disease problems for Ghana, having a higher morbidity and mortality amongst pregnant women and young children. There is a large amount of microscopy work involving the examination of slides for malaria, and of stools and urine for ova, cysts and parasites. Nematodes are the most common finding, especially *Ascaris lumbricoides* and *Stongyloides stercoralis*.

Surprisingly, microscopic slides are washed and reused until they are so scratched they cannot be used anymore.

Tuberculosis

Tuberculosis is another disease where microscopy is the standard method of diagnosis. The current international recommendation is that all patients (with a few specified exceptions) have sputum specimens examined for TB bacilli before TB treatment is considered. Therefore sputum smear microscopy has been the gateway to TB treatment for most patients in Ghana. All these 4 laboratories perform microscopy for TB. **What I found most worrying was that the lab workers are not protected with a bacteriological safety cabinet and sputum sample are opened on the bench – thus a potential hazard to the personnel.** *We appeal to any organisation(s) who could donate used but functional bacteriological safety cabinets for our targeted laboratories.*

HIV

HIV diagnosis is increasingly available in Ghana close to the community due to the availability of, robust, rapid, point-of-care diagnostic tests. Rapid testing for HIV has been subject to a large degree of evaluation and development to allow for the selection of robust tests suitable for field conditions common to developing countries. Laboratories need to play a key role in the provision of anti-retroviral (ARV) therapy for HIV infection. The usual immunological indicator used in Western countries to assess a patient's need for therapy is CD4 counting and HIV RNA load. These carry a significant cost for equipment and reagents, specialised maintenance and are generally unsuitable for settings with poor power supply. However, I am very glad to report that Nkawkaw, Sefwi-Asafo and Pramso laboratories have analysers to perform CD4 counts.

Microbiology

Bacteriological culture facilities at Sefwi-Asafo and Pramso is an area to be initiated and supported by the hospital, philanthropists and governmental agencies. Holy Family, Nkawkaw and St Joseph's, Koforidua performs cultures on a limited number of samples. Motec is helping these labs to improve their culture techniques and hope that with time they would be at forefront in disease surveillance.

Local Practices

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. Motec life through its educational programmes is helping to address such concerns.

The ways forward are not limited to but would require the following equipments and reagents to help set up the microbiology laboratory so that it could function to a reasonable standard. Incubators, Microscopes, Water baths, Disposable/glass Petri dishes, Disposable inoculation loops, Anaerobic incubation jars, Staphaurex reagents, Streptococcus grouping kits, Antibiotic susceptibility discs, Cryovials, Microscopic slides, Facemasks, Centrifuges.

Gratitude

Motec-Life would like to say a big thank you to Oxoid Ltd who has donated substantial quantities of reagents for educational purpose to support our work at these hospitals. Thanks also to Quest Diagnostics for donating 2 CO2 incubators (yet to be shipped). Special thanks to MIDA for twice sponsoring me for this trip.

Conclusion

The laboratory has a critical role to play in supporting the delivery of Ghana's Essential Health Package, but the resource requirements of a laboratory service and a lack of understanding of how they function can be barriers to allocating adequate support. However without an effective laboratory service patient diagnosis and care is often compromised, expensive drug treatments are squandered, diagnoses are missed and information about public health is inaccurate. It is also impossible to measure the true effectiveness of interventions and to conduct accurate disease surveillance.

References

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