



Medical Mission Institute Würzburg

Catholic Advisory Organisation for International Health

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Trip Report

Report on

Training for YMCA Referral Dispensary

3 DAYS WITHIN THE PERIOD OF 2 OCTOBER TO 23 OCTOBER 2013

Hanne Fleischmann, Certified Laboratory Instructor, MSc MP, QMO
Technical Consultant

Medical Mission Institute Würzburg, Germany

ABBREVIATIONS

ABBREVIATION	EXPLANATION
CO	CLINICAL OFFICER
CVJM	CHRISTLICHER VEREIN JUNGER MENSCHEN
HC	HEALTH CENTRE
LA	LAB ASSISTANT
LAT	LAB ATTENDANT
LT	LAB TECHNICIAN
MRDT	MALARIA RAPID DIAGNOSTIC TEST
MSC MP	MASTER OF SCIENCE IN MEDICAL PARASITOLOGY
MSD	MEDICAL SUPPLY DEPARTMENT
QC	QUALITY CONTROL
QMO	QUALITY MANAGEMENT OFFICER
RD	REFERRAL DISPENSARY
SOP	STANDARD OPERATING PROCEDURE
YMCA	YOUNG MEN'S CHRISTIAN ASSOCIATION

EXECUTIVE SUMMARY

YMCA Moshi runs a dispensary with one medical doctor, one clinical officer (CO), a dentist, nurses, a small laboratory and technical personnel. A young trained laboratory technician started his work one month ago. Additionally one elderly assistant and one laboratory attendant are employed in the lab.

The senior doctor and the CO wanted to improve the laboratory with new machines but so far only the young lab technician will be able to handle the spectrophotometer. A haematology analyser that was planned at the beginning is not recommended for the time being. This will overload the lab with sophisticated machines, which cannot be operated by a single technician.

For a start, the doctor and the laboratory agreed on the following biochemical tests: AST, ALT, Creatinine, Uric Acid, Urea and Cholesterol. Test strips will be used for blood sugar and haemoglobin should be tested with the HaemoCue (Point of Care Device). The latter can be purchased at the Medical Store Department (MSD) at a reasonable price if it is available. The cuvettes can be bought from the private market, but they

are expensive (1000 TSH = 0.50 Euro). Besides this, the management should not buy additional devices, they should start with the ones that are available in the laboratory. Contact should be made to the St. Luke's Foundation in case of break down. Frank Weithöner, a medical technician, already supported the lab.

TABLE OF CONTENTS

ABBREVIATIONS	2
EXECUTIVE SUMMARY	2
INTRODUCTION	4
TERMS OF REFERENCE	4
REPORT	4
SPECTROPHOTOMETRY	4
WORKFLOW	5
MALARIA	5
ELECTRICITY	5
REFRESHER AFTER TWO WEEKS	5
ADDITIONAL MATERIAL NEEDED	6
NOTE OF THANKS	6
ANNEXES	7
ANNEX 1: TIME SCHEDULE FROM 3 MARCH TO 23 MARCH 2013	7
ANNEX 2: PERSONS MET IN YMCA MOSHI, TANZANIA	7

INTRODUCTION

YMCA Moshi runs a referral dispensary, which serves for the poor and offers services to the population of Moshi. One doctor, one clinical officer (3 years of training), one dentist, nurses, three laboratory staff and other technical personnel are working there. The laboratory is small; it is run by a laboratory technician, a lab assistant and one lab attendant.

During the a visit of the board of the CVJM Edenkopen a request for laboratory up-grading was discussed, some machines have been sponsored from Germany and sent to Moshi. To make sure that the sophisticated machines are used correctly the Medical Mission Institute was asked to give a brief introduction to the staff.

TERMS OF REFERENCE

- Introduction of Riele spectrophotometer
- Evaluation of the test flow and quality of tests

REPORT

During the stay in the dispensary of YMCA, the following topics had been looked at and they will be described in detail within each topic.

SPECTROPHOTOMETRY

A small laboratory is included in the referral dispensary of YMCA. They perform the basic tests for a dispensary. After the visit of the CVJM Edenkopen board, it was agreed on request of the dispensary management to improve the lab with spectrophotometry. During my visit, the dispensary management and the laboratory agreed on the following tests: transaminases (ALT & AST), uric acid, cholesterol, urea and creatinin. Unfortunately, we could not get all these tests in Moshi or Arusha. So we started with the programming of three different methods with altered principles such as cholesterol, creatinin and ALT.

The management was afraid not to buy the good chemicals for the spectrometer, so we had to get them after my arrival. We tried in Moshi, but we had to go to Arusha to buy the test kits. Consequently, there was only one day left for the first part of teaching. Fortunately, the transport to Bwambo (Pare Mountains) came Monday after lunch, therefore, we could use the morning time for additional practical exercise.

Presently, only the lab technician (LT) is able to run the spectrophotometer. It is simple, but someone needs to understand the basics of a computer such as typing and entering data. Furthermore, it is essential to have reasonable knowledge of the English language.

Mr Bujiku Kayegeji (LT) learnt the procedures very fast and after a few hours he could already do some basic programming on his own. It was slightly more difficult to make a choice of the program type (kinetic, fixtime kinetic, endpoint etc.). The lab students are not used to identify methods and allocate them to calculation procedures.

As it was mentioned already in the first paragraph, we started with three different methods – the other tests, which are requested from the doctor, will be programmed similarly. Mr. Bujiku just had to follow the instruction papers.

For all tests Standard Operating Procedures (SOPs) have been compiled, printed and provided to the laboratory. However, they are only for the present test. Each parameter of different brands might vary and has to be adapted. It is planned that the laboratory gets a computer and Mr Bujika should be able to write the needed SOPs.

New methods (even the same parameters) need new SOPs. When somebody buys new tests it should be looked at the **quantity of serum/plasma (no 5µl) and reagent (not less than 500 µl)** that the automatic pipettes are available in the lab or the spectro can test the mixture. They need to be run by **filter** of 340 nm, 405 nm, 492 nm, 546 nm, 578 nm or 623 nm or close by one of them. No bi-chromatic tests should be used. No test which runs with 25° or 30° C because the room temperature may exceed this range.

WORK-FLOW

The staff has different responsibilities within the laboratory work according to their knowledge and experience. There is little chance to give extra variety to work. However, this allows the lab work to follow a stable work flow.

MALARIA

Malaria, which is not common in Moshi, is tested with thick blood film. The experience showed that the thick blood films (TBF) are over-diagnosed. It would be much better to use the malaria rapid diagnostic test (mRDT). This is quicker and easier to read and this allows also the staff to concentrate on the new tests which are quite time demanding.

The population of Moshi has a psychological malaria problem. Many people are coming to check for malaria but they are rarely positive. The lab is doing 15 malaria tests a day. As Bwambo has enough mRDT for the moment and it seems to be no stock rupture, I handed the provided mRDT for Bwambo to the staff of YMCA laboratory. They will finish them before the expiry date in 4/2014.

ELECTRICITY

There are regular power cuts. It would be easy to set up an un-interrupted power supply (UPS) with a solar battery (100mA), an inverter and charger. The battery is charged whenever electricity available, the inverter changes the 12 V into 220 V and all essential devices can be used. That will be for the lab the microscopes, spectrophotometer, incubator (not yet bought) and the centrifuge. The staff has to be well taught not to use it for fridge, hot oven and sterilizer. All the needed devices are available in Moshi.

REFRESHER AFTER TWO WEEKS

The two-week experience with the spectrophotometer showed that the LT is able to program almost correctly new methods and he can run new simple procedures without help from outside. Problems, which may occur for any reasons, could also be solved by e-mail or skype. A computer in the lab should get access to internet to get in contact with me when problems occur.

After the installation and 2 weeks' of use the machine printed for some filters "error code 46". At the beginning only for filter 492 nm then for all filters. Fortunately, I had contact to Dr Bernd Köhler, who is Director of the Infusion Project in Moshi. He put Mr Frank Weithöner at my disposal, a medical technician, who was able to repair the device after getting in touch with Mrs. Riele several times. The filter wheel (important for light focus during photometric measuring) came loose during transport and grinded when selecting the filter length. Due to the grueling search by Mr. Weithöner, the error could be located.

ADDITIONAL MATERIAL NEEDED

For the next weeks they should get an **incubator** (Riele 16 for tubes) **from Germany**, they need **Eppendorf tubes** (which are probably available at KCMC) and additional **supports (2)** for the tubes, **one mirror** for the microscope to over bridge the power cuts. **Printer paper**, if it is not available in Moshi, should be sent to the centre. However, the spectro can also be run without printing. Furthermore, a mixer for the tubes is needed (type vortex about 150 Euro). The fridge should be controlled by a max/min thermometer to assure that the reagents are always kept in good conditions.

At the start they requested a full blood cell counter, which does not make so much sense for the moment, but they should have a possibility to measure at least haemoglobin. The common machine in Tanzania is HaemoCue which costs about 600,000 TSH (300 Euro). But, it has to be considered that the cuvettes are not always available at MSD and they are very expensive on the private market (about 800 TSH each = 40 cents). A request to HaemoCue Germany for a non-profit project could help to get the machine at a cheaper price.

NOTE OF THANKS

First of all, I would like to thank Mr Michael Reinfrank and the CVJM Edenkopen for assigning this task to me. I am also grateful to Mr Lyatuu, Mr Munisi and Dr Msemo for their warm reception and full support during my stay, and for assisting me with access to work facilities. Dr Msemo gave his blood to support the laboratory training for exercise. I sincerely would like to thank Ms Katrin Willem for assisting during the laboratory training and printing out SOPs and service manual.

A big thanks goes to Frank Weithöner, who found the problem of the spectrophotometer, repaired it and so the machine could finally be introduced and is now ready for testing. A doctor from KCMC promised to send patients to YMCA when the biochemistry lab is not operational in KCMC.

Last but not least, I would like to thank Mr Bujiku Kayegeji, Marc Kway and Josephine Lazaro, who spend their time to follow the sessions. Mr Bujiku was always present and stayed up to 8.00 pm in the evening to make sure that he is able to run all the parameters they are available now.

ANNEXES

ANNEX 1: TIME SCHEDULE FROM 3 MARCH TO 23 MARCH 2013

Date	Activity
2 Oct 13	Departure to Moshi, Tanzania via Addis Abeba
3 Oct 13	Arrival in Moshi Due to overbooked plane of Ethiopian airline the arrival delayed 6 hours
4 Oct 13	Shopping of biochemicals and additional material in Arusha, Set up of spectrophotometer
5 Oct 13	Programming of tests on the Riele spectrophotometer and setting up of different methods
6 Oct 13	Writing of Standard Operating Procedure
7 Oct 13	Repeating and correction of SOPs for better understanding Discussion of needs for the laboratory Departure to Bwambo
8 – 17 Oct	Stay in Bwambo
18 Oct 13	Travel to Moshi
19 Oct 13	Refresher course in YMCA Referral Dispensary, error code 46 and contact to the St. Luke's Foundation (infusion program) in Moshi, contact to Mrs Riele in Berlin, introduction of Frank Weithoener, trail to fix the machine
20 Oct 13	Travel to Mwanza, Bugando
21 Oct 13	Bugando visit
22 Oct 13	Travel: Mwanza to Moshi, repair of the spectrophotometer, first test run failed because of power cut Second run in the evening at 6.00 pm was successful, ALT quality control (QC) ok, Creatinin QC ok, programming of uric acid, test run with QC was ok. Travel to Addis Ababa 1.00 am, Travel to Germany
23 Oct 13	Arrival in Frankfurt, Germany

ANNEX 2: PERSONS MET IN YMCA MOSHI, TANZANIA

Mr Lyatuu	General Secretary
Mr Munisi	Secretary
Dr Msemo Hannieh	Senior Doctor of Referral Dispensary (RD) YMCA
Dr Shila	Clinical Officer of the Referral Dispensary YMCA
Mr Bujiku Kayegeji	Lab technician (working since 1 month in RD YMCA)
Mr Marc Kway	Lab assistant (LA working since 3 years)

Mrs Josephine Lazaro Lab attendant (LAT working since 4 years)

Katrin Willem Volunteer at the YMCA