YES NEWS

A NEWSLETTER FOR THE YOUNG EMERGING SCIENTISTS

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Quarterly theme: Good Clinical Practice (GCP)

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Editorial

Dr Jane Kabwe
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Welcome to the fourth edition of the YES News which marks the conclusion of Volume 1 series. This quarter's theme focuses on good clinical practice (GCP) in commemoration of the recently held GCP training by the collaborative efforts of three organisations: Institute of Medical Research and Training (IMReT), Trials of Excellence in Southern Africa (TESA) and YES Zambia. Not so long ago, the theme for the third edition was "enhancing collaborative innovations in research mentorship" in which three organisations also came together and founded the first medical students' research and career mentorship symposium. Indeed it cannot be overemphasized that "collaboration" is the new word on the block, and in order for individuals and organisations to make an impact and foster development in the area of research and mentorship, they should be enhancing good collaborations with measurable outcomes.

Not only has the year come to an end but the decade too has been concluded. We are so excited looking back where started from as YES Zambia barely a year into existence, gives us so much drive and enthusiasm to achieve the objectives for the next decade. Many people are making New Year resolutions about life in general or better still professional development goals (PDGs). Whilst all this is good, without purposefully ensuring that one's daily activities are in alignment with achieving the laid PDGs, or getting one step closer to them, then it is all futile. Clinical audits are carried out in order to measure and establish how close or further away the practices are from the set standards. Perhaps the same should be considered as an individual to evaluate the daily, weekly and monthly activities in proportion to the time spent on those activities and how closer or further away they are drifting one from attaining the set goals.

It is the lack of planning, prioritising and accountability to one's schedule that leads sometimes to unfair practices and unprofessional misconduct. GCP by definition is 'an international ethical and scientific standard for conducting biomedical and behavioural research involving human participants.'[1] There are many examples of unethical conduct in research and YES Zambia curriculum has incorporated the GCP training in the beginner's stage of the mentorship program so that the mentees are able to conduct their research after being trained in GCP. The objective is for them to demonstrate the importance of professional conduct whilst carrying out research. This starts from the basics such as acknowledging the sources of information used in the write up appropriately. With many accessible online tools, any researcher can subject their works to such tools in order to check for plagiarism before submitting anywhere for either an academic assignment or manuscript publication.

Wishing you all our esteemed readers a fruitful new year, we hope you enjoy reading this edition.

"There is potential in each and every one of us" Dr Myles Munroe.

REFERENCE

1. National Drug Abuse Treatment Clinical Trials Network. Good Cilinical Practice Training. Available at: https://gcp.nidatraining.org/

To all Young Emerging Scientists across all fields of science in both private and government institutions, if you would like to share your work through the YES NEWS, we accept well written articles in the form of:

Abstracts

Perspectives

Reports

To submit an article email: yesnewseditors@yeszambia.com

Good Clinical Practice and Good Clinical Laboratory Practice Training

By Priscilla Kasonkomona and Mercy Imakando

Good Clinical Practice(GCP) is an international quality standard for conducting clinical trials that is provided by the International Conference on Harmonisation of Technical Requirements for Registration of Pharmaceuticals for Human Use (ICH) in some countries. Good Clinical Laboratory Practice guidelines (GCLP) on the other hand describe the application of those Good Laboratory Practice principles that are relevant to the analyses of samples from clinical trials while ensuring that the objectives of GCP are maintained. The training ultimately gave guidance on how to protect human subjects and volunteers in clinical trials. It also outlined the roles of Institutional Review Boards, Clinical Research Investigators, Clinical Trial Sponsors and monitors. YES Zambia collaborated with IMReT under the auspices of Trials of Excellence in Southern Africa (TESA) in September 2019. The total number of participants was 21 including international delegates from Angola and Mozambique the facilitators were from South Africa.

As Young Emerging Scientists involved in research, the training could not have come at a better time. The 3-day training was timely and highly informative, it will surely play a big role in producing quality research. The strategy of interactive presentations encouraged participation in the lessons while small group discussions and assignments allowed the consolidation of the lesson presentations.

The facilitators of the training were consultants from LT clinical research Ltd-Dr Sumen Govender and Ms Siza Mphele. The keynote address was delivered by Prof. Godfrey Biemba- Director and Chief Executive Officer for the National Health Authority (NHRA) and Adjunct Research Assistant Professor at Boston University School of Public Health. Other speakers included Professor Peter Mwaba- Dean at the Lusaka Apex Medical University (LAMU), Dr Sody Munsaka-Chairperson at the University of Zambia Research Ethics committee (UNZABREC), Dr Alex Makupe -Head Clinical Care and Director Technical services and Diagnostics- University Teaching Hospitals and Ministry of Health), Dr Duncan Chanda-host and Co-Director at the Institute of Medical Research and Training IMReT, Dr Mwansa K. Lubeya-Lecturer at The University of Zambia School of Medicine and co-founder for YES Zambia, Dr Jane Mumba-Registrar at the University of Zambia School of Medicine-Obstetrics and Gynaecology and Eng. Rodrigues Matcheve-Project Coordinator for Trials of Excellence in Southern Africa (TESA).

Speakers in picture-Left to right: Dr M.K Lubeya, Dr D. Chanda, Dr J. Mumba, Dr S. Munsaka, Prof. P. Mwaba, Eng. R. Matcheve, Ms S. Mphele, Dr. S. Govender and Prof. G. Biemba.

Selfie time!! Participants pose for a selfie with Dr Alex Makupe

Dr M. K. Lubeya (center), having a conversation with Dr D. Chanda (right) and Dr S. Munsaka

Dr Jane Mumba (R) with Ms Siza Mphele (L)

Participants having a hearty laugh during a break

Participants during small group discussions

Experiences by some of the GCP/GCLP participants

Zumbi Njoolo

"GCP/GCLP training opened doors for me and made it possible for me to work as a research assistant for one of my professors"

The Good clinical practice (GCP) and Good clinical laboratory practice (GCLP) training was no ordinary training for me, but a life-changing event. I made friends and acquaintances that have continued to influence and shape my career. Some I have come to call sisters, brothers and mentors, others even colleagues. Prior to the training, I had never even heard of GCP/GCLP, and that's a shame for a chemical and biological scientist. I have always looked up to my lecturers that are actively involved in research, even wanted to be like them. Having GCP/GCLP training opened doors for me and made it possible for me to work as a research assistant for one of my professors. It was such a wonderful learning experience for me. During the training, I took an interest in infectious diseases related research due to the influence of many great mentors in that field, the likes of Dr Duncan Chanda. With the influence of all the people I met and the skill set and knowledge acquired at the training, I am more than adequately equipped for big things and I am one to watch out for. The serene atmosphere and friendly delegates fostered the formation of collaborative teams, which I believe will last for many years to come.

During the training, the issue of ethics stood out to me, it made me realise that not all Research is good, no matter the end result, unless it follows good ethics and GCP/GCLP practices. Good researchers and scientists should remember that, WE ARE HUMAN FIRST, SCIENTISTS SECOND. No research is worth the life of another. I want to thank Clinical Research org, TESA, IMReT and YES Zambia for making such valuable knowledge accessible to me. Don't miss out next time! Learn GCP/GCLP and be a better researcher.

Rachael Mukyala

> “Little did I know that it would open my mind and totally change my perception about it”

Each and every new day brings to you fresh experience that can change your view on how you look at things and this is always taken in two ways either negative or positive. Mine was a positive experience at the GCP/GCLP training that was held at Sandys from the 25-27th September 2019.

My first GCP training was an online course and I can attest that the GCP online was different from this training. Before the training I thought to myself, “what can be different? It’s obviously the same GCP training I did online not so long ago.” Little did I know that it would open my mind and totally change my perception about it. This GCP/GCLP training was an eye-opener, the trainers had a deep knowledge of the course content and delivered it very well. For me, it opened up a new approach in research. The enlightenment during the training left a lot of people including myself walk away with a lot of knowledge. And what better way to test the knowledge gain than with another online test.

L-R: Rachael, Josephine and Deborah

Insights into Mental Health

Penias Tembo

YES Zambia Cohort 1 Mentee

"Addicts do change and they need as much support as they can get, for they possess the ability to influence society in a positive manner"

On Friday 11th October 2019, I was privileged to attend the Mental Health Conference under the theme "A Collaborative Approach to Suicide Prevention". This conference was held at Cresta Golf View Hotel in Lusaka Zambia and was facilitated by Renaissance and supported by Zambia Medical Association, Walk with Me Foundation, Psychology Association of Zambia and Zambia Psychiatric Association. The conference was the first of its kind in Zambia to bring together all known key stakeholders in a single room to discuss and address the most neglected health problem in the developing world.

In my 6th Year of medical school, I had rotated in Psychiatry and saw first-hand the important role mental health plays in society. However, I did not appreciate to the fullest extent how vital mental health is until I listened to the experience of a former addict that narrated of how his closest friends committed suicide due to depression that came from substance abuse and how he too was heading in a similar direction if not for the rehabilitation he had received. My perception despite being a medical student was "Addicts Cannot Change". How wrong I was! Today the former addict is a Psychiatrist heading a large public medical institution in Zimbabwe as well as a private rehabilitation Centre, thus rendering similar help to that which he received. What a remarkable turnaround. That experience reminded me of the need not to give up on individuals undergoing mental health challenges. Yes indeed addicts do change and they need as much support as they can get, for they possess the ability to influence society in a positive manner.

Furthermore, the conference brought out an essential need for collaboration to solve mental health challenges. It is not up to a clinician alone. All stakeholders need to play a part. Civil society organizations need to intensify their awareness campaigns and put pressure on policymakers to ensure mental health bills become Acts. There is also a need for early childhood training on mental health related-subjects such as addiction. This will help curb the stigma involving mental health that is prevalent among adults.

A huge concern that was raised during the breakaway workshop session themed “Emerging Issues in Practicing Mental Health in Zambia” was the ease at which addictive substances called Junta (Spirits) were easily accessible at a very low cost. Thus there was a call for more stringent measures to be taken against the sale of such substances that have had a bearing on the increasing number of suicide cases in Zambia. Furthermore, the need for better post detoxification care of current addicts was highlighted. The current trend is that after rehab, former addicts are sent back to the toxic environment from which they came from thereby easily relapsing.

Penias Tembo

The conference not only improved my understanding of critical mental health issues affecting Zambia but also accorded me an opportunity to network with like-minded individuals that are working toward improving the status quo of mental health in Zambia. It certainly was a game- changer!

Insights into Mental Health

Tepwanji Mpetamoya
YES Zambia Cohort 1 Mentee

"There is help available. And where there is help, there is hope."

According to global statistics, every 40 seconds, someone dies of suicide. It's one of the leading causes of death in the 15-29 year age group and 80% of suicides occur in low and middle-income countries. However, suicide is 100% preventable. The question remains "how?"

This is the fundamental question that steered me towards the 2019 Mental Health Conference themed "A collaborative Approach to Suicide Prevention." I have known for a while that there are systems put in place to battle the rising rates of suicide. And that there are individuals and organizations dedicated to the cause. However, to me, it was a fact that had no face to it until the conference. It was there that I was able to meet and interact with people from all walks of life who are in their own different ways, actively involved in suicide prevention.

As I sat in the conference hall, listening to the paper presentations outlining diverse work on the subject matter, I looked around me at the different faces clustered together. Despite coming from different backgrounds, all paid close attention to the information given by the speakers. I had an epiphany. Suicide is a mental health problem that's not limited to psychology or psychiatry. It stretches far beyond that. It affects everyone.

In that room were ministry of health officials, lawyers, police officers, bible school students, nurses, teachers, nuns, human rights advocates, celebrities and of course, there was me Tepwanji. A medical student in awe of the contribution each person was making towards suicide prevention both directly in their line of work and indirectly by being at this conference.

Did you know that in 2017, 7.8% of the Zambian population admitted to having considered attempting suicide in the past 12 months? With the largest proportion in the 19-29 years age group? (Zambia Stepwise Survey for NCD's for 2017).

Surprising, isn't it? Nevertheless, these are local statistics. "Whose part of this 7.8%?" you may be wondering. It could be your neighbour, your child, your parent, your friend. It may be the delightful co-worker that you say hello to every morning or the friendly face you see on the bus as you ride to church. It could be your spouse, it could be your sibling, and if we are being honest, it could be you.

There is help available. And where there is help, there is hope.

There's so much I learnt from this conference from the different workshops and panel discussions. But the resounding message I took away from my experience was mental health affects us all and as such we all need to be a part of the change we want to see.

TOP-TEN-WITH-MENTORS (YES ZAMBIA)

Dr. Kunda Mutesu-Kapembwa

Dr. Kunda Mutesu-Kapembwa, an alumna of the African Paediatric Fellowship Program, is a Zambian Paediatrician and Neonatologist currently heading the Neonatology Department of the Women and Newborn Hospital-University Teaching Hospitals in Lusaka Zambia. She is also the Coordinator of Neonatal services in the Ministry of Health, a position that is contributing to the shaping of neonatal care at hospital and community level in Zambia.

She is a founder of a non-profit organisation called Newborn Support Zambia whose functions include advocacy for improved neonatal services as well as help with capacity building in the care of neonates.

Dr. Kapembwa graduated from the University of Zambia, School of Medicine (UNZA) in 2003 and did her Master of Medicine in Paediatrics and Child Health at the University Teaching Hospital under UNZA in 2010. She then went to the University of Cape Town for her Neonatology Training, sponsored by the African Paediatrics Fellowship Program and returned to work in Zambia in 2015.

She is currently the only practicing neonatologist working in the public sector in Zambia, a scenario she wants to change before she retires.

Q1. What does research mean to you?

To me research is a means to find answers to pertinent questions that when answered change practice.

Q2. What do you think of research mentorship for students and young scientists?

Research mentorship is very crucial because it opens up the minds of young students making them ask the necessary questions and know how to ask the questions for the answers they seek.

Q3. What kind of research would you like to do if you had all the resources?

I would like to do operational research because it is involves actually being on the ground and does not disrupt patient care

Q4. What has been your major challenge(s) in carrying out research work?

Limited time. I am more on the clinical area and find very little time to do research.

Q5.Why have you been consistent in doing research seeing as most Drs only do clinical work?

I have not been as consistent as I would like to be.

Q6. How have you managed to balance research and clinical work, do you even draw a line?

Still working on the balancing act. The challenge has been shortage of staff to help with clinical work.

Q7. What has been your greatest lesson over the years?

Perseverance is key to succeed in anything.

Q8. Which of your publications would you like to share in summary (what were the pertinent findings)?

Mutesu-Kapembwa, K., Andrews, B., Kapembwa, K., Chi, B. H., Banda, Y., Mulenga, V., and Kankasa C. (2010). **Performance of modified WHO presumptive criteria for diagnosis of HIV infection in children <18 months admitted to University Teaching Hospital in Lusaka** *Med J Zambia. ; 37*(2): 64–70. PMCID: PMC3500600 NIHMSID: NIHMS413915

This was a sensitivity and specificity study regarding CD4% and DNA PCR in the diagnosis of HIV. In this study, we were trying to see whether a very low CD4 coupled with some clinical features was predictive of HIV infection in Children below 18 months old. This is because in this time, the wait for DNA PCR to confirm infection was very long and the infants were dying. The results were able to help us start treatment as we waited for the DNA PCR.

Q9. Where do you see your research path 10 years from now?

I would like to be more involved in research activities.

Q10. What's your advice to YES mentees and any early career researcher?

It is important to be able to balance research and clinical work. It may not be easy depending on the field of specialization because some specialties are very time consuming and demand more on the clinical side.
Otherwise, write down your questions and try answering them slowly.

STUDENT ELECTIVE REPORT

The Phoenix Project - Erasmus + Program: University of Zambia (UNZA) Student exchange program to Cardiff University Report

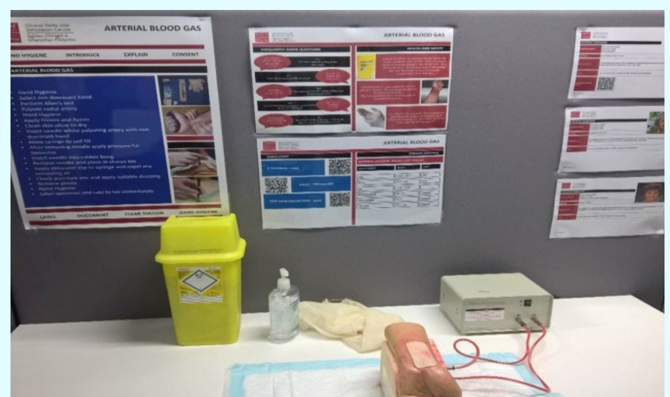
Zyambo Albert
YES Zambia Cohort 1 Mentee

I was among four students selected from the University of Zambia (UNZA), School of Medicine for an international medical exchange program. This was sponsored by the Phoenix Project and the Erasmus plus program. We were to spend a total of three months doing a placement at Cardiff University (CU), School of Medicine at the University Hospital of Wales (UHW), in Cardiff, Wales, United Kingdom.

The Tour

On Friday, 12th April, 2019, we were welcomed and taken on a tour of the UHW and CU School of medicine campus. I vividly recall being amazed at how clean the hospital environment was. The hospital itself has broadly three impressive buildings. The Adult Hospital has seven floors and houses various medical and surgical ward specialties, outpatient clinic and surgical theatre placed in a maze of connecting corridors and elevators. It has an Acute and Emergency (A&E) department complete with and ambulance bay and a helipad for the Air ambulance. Adjacent to the adult hospital is a colorful children hospital called Noah's Ark. This has its own A&E department, and ward named after animals and a Jungle (Penguin, Owl, Jungle are what I can remember). It also has its own outpatient clinics and a play park. Behind this hospital structure is a Dental hospital where dental students have their clinical practice and assessments.

A tour of the CU medical library and skills centre was quite a marvel for me, having come from a resource-limited country. The Library has three floors, equipped with computers having access to fast internet, medical research resources, and is stocked with up to date medical and health science books. The place itself is conducive with a relaxing atmosphere to make studying a joy. The skills centre was well equipped with different models and manikins on which to practice clinical skills. Each station had guides and links to video tutorials that provide step by step guide on how to go about various medical skills. A tutor was available every Wednesday to help with skills lessons.



Arterial Blood Gas station in skills lab.

The University Hospital of Wales.

The Cochrane Building where the Library and Skills center are housed.

The Placements

On Monday 15th April, 2019, I started my clinical placements. I was assigned a consultant who would assess my clinical skills and knowledge. It was my first time being assigned a consultant on a one-on-one basis in my medical training. But as it turned out this arrangement has great advantages as one gets to benefit from the years of experience that the consultant had. Such a learning environment as I soon understood makes a student proactive and encourages participation. The consultants were quick to pick up on weakness and assist me where I was lacking. In most cases, I benefitted a lot as I was taught to use various equipment that is seldom available in my home environment.

For instance, while in Ophthalmology, my consultant, Mr. Albamani, taught me how to use the slit lamp to examine the outer eye and how to use the 90D lens to examine the retina. It was difficult at first but in the three weeks I was there, I could see myself improving and gaining experience on the use of the instruments.

With Mr. Albamani, a Medical retina and Uveitis specialist.

During my surgical placement, I also witnessed a number of surgeries being done. Emphasis is placed on infection control throughout these procedures. Most materials used in theatres are disposal including drapes and scrubs. The use of modern medical equipment for various procedures was amazing. For instance, during my Maxillo-facial and Ear, Nose and Throat (ENT) placement, I witnessed multiple radical surgeries for cancers with reconstruction using flaps and this involved use of a specially designed microscope to allow vascular anastomotic suturing of arteries and veins. I was greatly amazed the first time I saw this procedure.

I observed Robotic surgery for Prostatectomy using a robot trade named Da Vinci. This procedure reduced blood loss and length of hospital stay for the patients among other complication of surgery. In fact, patients could be discharged on the very day of surgery.

Lessons Learnt

There were a number of aspects of clinical practice that made this experience exciting. One such aspect was the “Bare Below Elbow” principle. This entails that all medical and health personnel should fold their sleeve within the hospital especially on the wards. No lab coats, jewellery, wristwatches or rings and neckties should be worn while on the wards. This along with regular washing of hands and use of hand sanitizers helps reduce the transfer of infection between patients.

Patient management was equally impressive. Generally, patients are well informed of their medical conditions, and are thoroughly

investigated by the medical teams and at times multi-disciplinary teams (MDT). After which the patient is informed of the treatment options available. The patient consents for the treatment option of their choice. Thus, patient management if shared responsibility between the patient and medical team.

The hospital makes use of the New Early Warning Score (NEWS) to triage patients. Therefore, each patient that walks into the hospital has a NEWS score that helps determine how rapidly the case is accelerated to avoid patient deterioration.

All in all, this medical elective was great and to experience the practice of medicine in a developed country was an experience unlike any I could have imagined. The learning environment was amazing and very conducive, it encouraged participation. It was great to wake up every morning looking forward to being on the wards.

Apart from the academic side of things, I had the privilege to meet the dean of CU, school of medicine, Professor Riley. This was at a meeting with University of Namibia (UNAM) and UNZA students. He took the time to welcome us and gave us his expectation of the exchange program. Professor Riley briefly took us through how medical teaching has evolved in the UK to where it is today, and how to best emulate such changes in our settings.

I had the privilege of meeting Professor Judith Hall, who was vital in making the exchange program a success. The UNZA and UNAM students received amazing support from Professor Hall and her team and the Cardiff University team. They arranged our transportation, accommodation and allowance for upkeep. Sincerely gratitude to Professor Hall and the entire team.

With Cardiff University Dean Professor Riley.

UNZA and UNAM students with Cardiff University, school of medicine dean, Professor Riley (Left back) and UNAM visiting Deputy Associate Dean Dr Jacob Angara Sheehama (Right)

With Professor Judith Hall at the Department of Anaesthesia.

RECOMMENDATIONS

1. The University of Zambia, school of medicine should endeavor to continue this partnership with Cardiff University, the Phoenix Project and Erasmus Plus, as the experience and knowledge gained from the placement adds appreciation for medical practice as a whole.
2. The University of Zambia should strive to send test questions papers for forensic science so that students are not left behind as they go about their placement.
3. UNZA has to be more proactive in supporting its students for the exchange program in terms of up keep.
4. The Erasmus plus and Phoenix project should continue the good work of empowering African medical students by creating opportunities for them to experience medical practice and teaching in a developed setting.

1. GRADUATE WOMEN ZAMBIA (GWZ) CONFERENCE

The third Graduate Women Zambia Conference (GWZ) was conducted in partnership with the University of Zambia, School of Education from the 10th to 11th October 2019.

The theme for this year was ***'Balance for Better'*** and was officially opened by the acting deputy vice chancellor of the University of Zambia (UNZA).

There were different sessions in which various topics were presented and categorised as follows:

- Agriculture, mining, natural resources management, environment, climate change
- Women in power, politics and decision making
- Child marriage and gender based violence (GBV)
- Family and local community
- Education and occupational decisions of women
- Culture and religion
- Health, science and technology

YES Zambia wishes to congratulate two of the first cohort mentees to have not only presented at the 3rd GWZ Conference, but to have been the only presenters in their category, **"Health, Science and Technology"**. This indeed is a call to all scientists out there in these sectors to make use of such educational conferences for sharing and disseminating the finding of their research works.

Dr Sunela Sujan
Title of Research: Assessment of factors associated with mortality amongst neonates admitted in the neonatal intensive care unit at the University Teaching Hospital (2015 - 2017)

Dr Angela Zyongwe
Title of Research: Prevalence, indications and fetal / maternal outcomes of Caesarean sections at Levy Mwanawasa University Teaching Hospital

Dr Ntombi Mudenda GWZ President in the centre posing with Sunela to the left and Angela to the right.

Left to right-Kuzipa (7th year MBChB-UNZA), Chishimba, Zumbi (Biologist and Chemist), Dr A. Zyongwe, Dr S. Sujan.

Tepwanji joins Drs Sujan and Zyongwe for a photo

2. INDIA AFRICA HEALTH SCIENCES PLATFORM

Delegates from various African countries and the facilitators

Dr Mercy Imakando

YES Zambia wishes to congratulate the Director- Programmes Dr Mercy Imakando for being a recipient of an International training grant. She had this to say….

“It was exciting to be awarded a training grant in Epidemiologic Data Analysis and Inference at the National Institute of Epidemiology in India. With two other colleagues, Mr Enock Lungu and Patrick Sakubita, we represented Zambia. Other countries represented included: Morrocco, Ghana, Gambia, Cote D’voir, Ethiopia, Benin, Burundi, Cameroon, Sierra Leone, Nigeria, Togo and Gabon. We were the first team to attend such a short course in the subject area. The lessons were very enlightening and by the end, we were all able to use Epi Info to enter data, analyse and conduct logistic regression. Special Thanks to the Sponsors- African Union Scientific Technical Research Commission together with the Indian Council for Medical Research (IMCR) and the staff at the National Institute of Epidemiology for their excellent organization, warm hospitality and well executed lectures and teaching sessions. I look forward to mentoring the young emerging scientists in these key topics that I learnt from this fellowship. ”

TB LAM, what's with the hype?

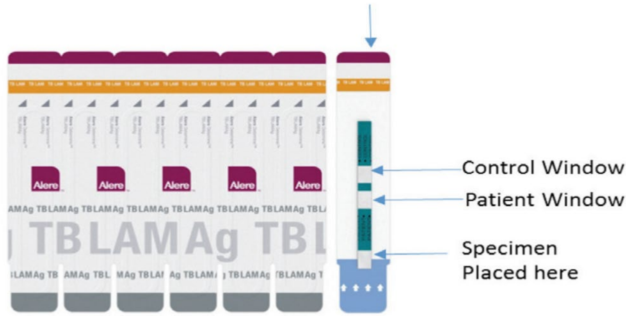
Dr Alinani Sikombe
YES Zambia Cohort 1 Mentee

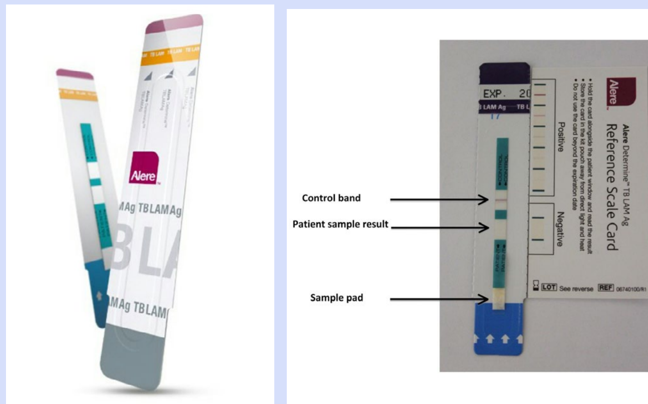
TB LAM, what's with the hype?

The lateral flow urine lipoarabinomannan (LF-LAM) assay reviewed is a commercially available test to detect active TB. TB LAM is a test based on the detection of mycobacterial lipoarabinomannan (LAM) antigen in urine and has emerged as a potential point-of-care test for tuberculosis (TB). Lipoarabinomannan antigen is a lipopolysaccharide that is present in mycobacterial cell walls, it is released from metabolically active or degenerating bacterial cell walls and appears to be present mostly in people with active TB disease or ongoing infection. Urine-based testing would have advantages over sputum-based testing because urine is easy to collect and store and lacks the infection control risks and rules associated with sputum collection.

The test is performed manually by applying one drop of urine to the Determine TM TB LAM Ag test strip and incubating the strip at room temperature for about 25 minutes. The strip is then inspected by eye. The concept is like that of the Malaria rapid diagnostic test (RDT) kit, and other RDTs, thus very easy to use and does not require expert training like needed to be able to use GeneXpert and culture studies.

The TB LAM test, manufactured by Abbott (formerly Alere), costs just USD3.50 and requires no electricity or reagents5,7. It has been shown to allow faster and earlier TB diagnosis in people with advanced HIV, and to reduce TB mortality. The test is performed manually by applying about 60µL of urine to the Determine TM TB LAM Ag test strip and incubating at room temperature for 25 minutes. The strip is then inspected by eye.





TB LAM testing has been recommended by the World Health Organization for use in people with advanced HIV since 2015, and Global Fund and President's Emergency Plan for AIDS Relief (PEPFAR) funding can be used for TB LAM procurement and implementation. But only a few countries like eSwatini, South Africa, and Uganda have scaled up TB LAM testing nationally. Because of the strong association with HIV prevalence rate, which is about 16% in some parts of Zambia8, the need for this cannot be more emphasized.

It's important to note that TB is the number-one killer of people living with HIV, and WHO estimates that 30–50% of people with tuberculosis are untreated, in part because of underdiagnosis. Patients with undiagnosed tuberculosis are most likely to transmit infection, so strategies to reduce disease burden should focus on improving the pathway to care for patients by early diagnosis. Using TB LAM tests, an inexpensive, urine-based test, has been proven to decrease mortality rates and allow for earlier diagnosis among people living with HIV. Yet, TB LAM testing is underrepresented in countries that are supported by PEPFAR and the Global Fund to Fight TB6. Little light is being shone on this innovative device.

TB LAM diagnostic test—a simple, inexpensive and life-saving test for detecting TB in people with advanced HIV who are at the highest risk of dying from TB - is a worthwhile investment5. As people with advanced HIV are much more likely to have disseminated TB (TB outside of the lungs) and to die from TB without receiving a diagnosis, it's particularly important for more countries to adopt the TB LAM test as a diagnostic method for all HIV infected patients presenting to hospitals, presenting to ambulatory care with signs of advanced disease or with low CD4 counts. It's a known trend that most patients will present to the hospital because of opportunistic infections associated with HIV/AIDS, which commonly happens to be TB. High CD4 counts have been shown to give false negatives, so primary screening in HIV negative populations is said to be inconclusive because of its low sensitivity in such surveys.

With that said, the disadvantages of TB LAM, illuminated by recommendations made by Guideline Development Group;

☞LF-LAM (lateral flow urine LAM) does not differentiate between the various species of mycobacterium and cannot be used to distinguish M. tuberculosis from other species. However, in areas endemic for tuberculosis the LAM antigen detected is likely to be attributed to M. tuberculosis.

☞Implementation of LF-LAM in the targeted patient groups does not eliminate the need for other diagnostic tests like Xpert MTB/RIF, culture or sputum-smear microscopy. This is because these tests exceed LF-LAM in diagnostic accuracy.

☞Whenever possible, a positive LF-LAM should be followed up with a confirmation test such as Xpert MTB/RIF, line probe assay or bacteriological culture and drug-susceptibility testing.

☞LF-LAM is designed to detect mycobacterial LAM antigen in human urine, other samples like sputum, serum, plasma, CSF, other body fluids or pooled urine specimens should not be used because the results are subjective and this area needs more research.

☞LF-LAM test cards must be stored at 2-30°C until the expiration date. Devices that have expired, become wet or if the packaging has become damaged should not be used.

Several studies overseen by WHO before 2015 showed sensitivity estimates ranging from 0% to 53%, and specificity estimates from 91% to 100%. The pooled sensitivity of LF-LAM was 37% compared with 47% for sputum microscopy (using a microbiological reference standard). The pooled specificity of LF-LAM was 95% versus 98% for sputum microscopy on HIV positive patients in clinical stage 4 HIV1. For TB screening among patients regardless of TB symptoms, LF-LAM pooled sensitivity was 23% and the pooled specificity was 96% compared with a microbiological reference standard. As such, the Guideline Development Group felt that a screening strategy based on LF-LAM alone cannot be relied on[1,2].

However, that was in 2015, just last year, a study by Gupta-Wright et al, in which sputum was tested using Xpert MTB/RIF, and in the intervention group urine was tested using LAM and Xpert MTB/RIF assays showed that the expanded use of urine LAM assays for TB screening in inpatient settings could reduce mortality among high-risk groups, as well as reduce morbidity and onward transmission resulting from missed TB diagnoses[3,4]. Urine-based TB screening therefore significantly increases the number of people diagnosed with TB, with urine LAM assays providing the highest diagnostic yield (thus it can be inferred). So this means a patient in a rural and impoverished area will receive quick diagnosis and immediate referral and treatment will be ordered, thus reduced the disease burden, death rate and government expenditure on treatment failure regimens associated with late and extrapulmonary TB manifestations.

Of course, the Gold standard will continue being Culture of any specimen suspicious of TB, GeneXpert will equally provide good information. Evaluation of the urine Lipoarabinomannan (LAM) test for tuberculosis screening amongst people taking antiretroviral therapy (ART) was shown to be low in some studies, but TB LAM that only takes 25 minutes to give results could mean life or death for a patient at primary level health center in an impoverished rural outskirt.

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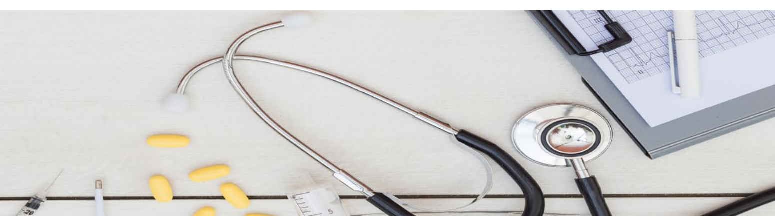

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