

## *Paper Presentation*

# **The Role of Laboratory Medicine in Health Care Delivery**

**Being the text of the 1<sup>st</sup> Professor Alfred Ebruke Jarikre's memorial lecture  
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### **Background**

The Honourable Commissioner or Higher Education, Delta State  
The Vice -Chancellor, DELSU  
The Deputy Vice-Chancellors  
The Registrar  
The Bursar  
The University Librarian  
The Provost, College of Health Sciences  
The Deans of Faculties  
Mrs Bolatito Jarikre - widow of late Professor Alfred Ebrukevbe Jarikre in whose honour we are today assembled  
Professors  
Directors  
HODs  
Distinguished Invited Guests, Ladies and Gentlemen  
Gentlemen of the Press

It is with a deep sense of humility that I stand before you all, this day on the kind invitation of the College of Health Sciences, DELSU to deliver this lecture on the Role of Laboratory Medicine in Healthcare Delivery as a befitting memorial to our departed colleague, the late Professor Alfred Ebrukevbe Jarikre, Foundation Dean of the Faculty of Clinical Medicine, DELSU, who translated to higher service on the 11<sup>th</sup> June, 2009. I am particularly delighted that even as today's event evokes painful memories of his short but fulfilled sojourn here on earth, it also affords us an opportunity to reflect on the life and times, works and scholarly contributions of this distinguished Academician, Medical doctor

and worthy son of Delta State to the advancement of knowledge in his chosen field which has direct relevance to the topic of today's engagement.

When Adam and Eve as recorded in the book of Genesis, chapter three (3) fell out of Celestial favour in the garden of Eden by Eve succumbing to the serpent's deception, God had them thrown out and as part of the enduring sanctions, from then on man came to know suffering, disease and death. It was in man's ensuing and unrelenting quest to understand disease, suffering and death that the medical profession emerged. Ironically the symbol of the medical profession- the bronze serpent on the wooden staff as designed by

Moses on God's instruction as a healing instrument still bears the serpent that ab initio was responsible for man's loss of Eden and its resultant devastating consequences. The evolution of laboratory medicine, naturally followed man's efforts through the centuries since creation to understand and deal decisively with his numerous physical afflictions as first perceived clinically.

Laboratory Medicine has always been an integral part of proper clinical medicine. Suffice it to say that majority of life changing breakthroughs in medicine happened and have continued to happen in the area of laboratory medicine, which is considered the scientific foundation of medicine. The spectrum of laboratory medicine covers the functioning of the various body systems in both health and sickness. Thus the scope ranges from the basic medical sciences of Physiology, Anatomy and Biochemistry to Chemical Pathology, Medical Microbiology and Parasitology, Haematology/Immunology, Pathology i.e. Anatomic Pathology. Also included are genomics, proteomics, tandem mass spectrometry and micro array technologies. Advances in technology have through the centuries continued to revolutionize the methods and practice of laboratory medicine with very palpable outcomes for patients, medical practitioners and scientists.

At this juncture, I will crave your indulgence to do a little more detailed analysis of the impact and role of laboratory medicine in ensuring an efficient, prompt and effective healthcare delivery system.

### **1. SCREENING FOR RISK FACTORS OF DEVELOPING SPECIFIC DISORDERS**

Screening tests may be conducted on asymptomatic individuals in order to check for

risk factors and other indicators of developing or latent disease. Some of the tests for children and young adults can avoid or diminish the impact of diseases and medical conditions that appear later in life. Furthermore, screening tests for adults can detect certain common diseases that when identified early can be easily treated- these include; Diabetes mellitus, colonic cancer, prostate cancer, cervical cancer, sickle cell carrier trait e.t.c.

### **2. DIAGNOSING CONDITIONS AND EVALUATING PROGNOSIS**

Laboratory medicine is key to or critically important for accurately diagnosing and determining the severity of disease. Equally important is the place of laboratory medicine in assessing the likelihood of recovery and follow up. Potential adverse outcomes can also be evaluated by laboratory medicine. Accurate diagnosis, especially early-stage detection of disease through laboratory tests helps the healthcare provider and even the patient to take measures that prevent or reduce the risk of developing the full blown disease or consequent complications. Such measures include but are not limited to life-style modifications, increased medical monitoring, medical interventions e.t.c.

Thus early laboratory diagnosis minimizes the severity of disease and its effects on mortality, morbidity and quality of life. For example, early detection incipient colon cancer by using faecal occult blood testing is associated with more successful treatment and increased survival.

### **3. MONITORING GENERAL TREATMENT EFFECTIVENESS**

Laboratory medicine investigations play a major role in monitoring and evaluating the efficacy of other medical treatments. Some of these tests used to monitor treatment

effectiveness are the same as those used to make the initial disease diagnosis e.g Thyroid stimulating hormone estimation is used for both diagnosis and monitoring of thyroid disease. Carcino-embryonic Antigen levels aid in diagnosis and monitoring of colonic cancer. However, some of the laboratory tests are basically used for monitoring and not diagnosis e.g cluster designation (CD4) count in the assessment of response to anti-retroviral therapy.

The areas under monitoring of treatment by laboratory medicine include - managing acute health conditions ie electrolyte levels, arterial blood gas profiles, coagulation indices, glucose levels, serum protein S100, D-dimer levels e.t.c. In chronic health conditions, laboratory tests monitor play key role in estimation of HbA<sub>1c</sub>-glycosylated hemoglobin level in diabetic therapy follow up, lipid profile evaluation for cardiovascular disease and glomerular filtration rate (GFR) in cases of chronic kidney disease.

In therapeutic drug monitoring, laboratory tests are integral to management of drugs with narrow therapeutic regimens. The tests are also instrumental in establishing and maintaining the medication dosage that will yield the optimum blood level range for a specific individual. Laboratory tests also provide a means to prevent and detect medication errors i.e errors occurring in the medication use process, such as wrong dosages prescribed or administered, failure of compliance by the patients.

#### **4. VALUE TO THE QUALITY OF PATIENT CARE**

Healthcare delivery systems are grounded on six aims of quality with the patient as the centrepiece as defined by international best practices - safety, effectiveness, timeliness,

efficiency, equity and patient centredness. Laboratory medicine supports these six aims extensively and incontrovertibly. Safety refers to the protection of patients from harm due to care that is intended to help them and protect healthcare workers from harm while providing care. Laboratory medicine helps to diminish risk by accurate identification of specimens, appropriate collection and transport of specimens and application of analytical process control measures/quality assurance.

Effectiveness refers to measurement of how well healthcare interventions such as screening, diagnosis and treatment e.t.c achieve their intended outcomes. Laboratory medicine supports effectiveness by evidence-based test ordering, standardized specimen collection and analysis.

Laboratory medicine supports timeliness and cut down unnecessary delays with attendant consequences by decreasing turn-around times (TATS). This has been aided by the design and production of point-of-care test (POCT) kits by laboratory medicine techniques.

Efficiency refers to using resources to optimise production of desired results. Laboratory medicine contributes to healthcare efficiency by eliminating or reducing waste associated with inappropriate test ordering, recollection of specimens and repeat analysis e.t.c

Equity of care ensures that quality of care does not vary because of patient personal characteristics e.g sex, race, socioeconomic status e.t.c. Laboratory medicine contributes to equitable care when they provide services in a manner that is unbiased, use of reference intervals that account for population differences, accommodate the special needs of patients during specimen collection.

Patient -centred care is respectful of and responsive to individual patient values, preferences and expressed needs. Laboratory

medicine supports patient-centred care when test ordering reflects patient preference, specimen collection is designed for patient comfort and satisfaction- test results are understandable to and actionable by both patients and Physicians.

## **5. VALUE TO PUBLIC HEALTH SURVEILLANCE**

Laboratory medicine is very important and pivotal to identification of public health threats at both the individual and population levels. Examples include identification of associated infections or nosocomial infections. Medical Microbiology, an arm of laboratory medicine helps to monitor and control nosocomial infections. Identification of changing patterns of resistance to drugs by microorganisms and also incidences of multi-drug resistance organisms. Identification of infectious disease outbreaks e.g cholera, yellow fever e.t.c. Identification and amelioration of exposure to toxic, chemical and biological threats through early notification of enforcement officials.

Identification of fake or ineffective drugs-this is a role of laboratory medicine. What NAFDAC basically does is anchored on laboratory medicine -which has an invaluable role in prevention of disease.

## **6. VALUE TO EVIDENCE-BASED MEDICINE (EBM) AND DEVELOPMENT OF CLINICAL PRACTICE GUIDELINES**

Laboratory medicine supports the practice of evidence-based medicine and helps in the development of clinical practice guidelines which assist Clinicians and patients in making decisions about healthcare in specific circumstances. Evidence -based medicine has been hailed by many as a new paradigm shift

for medical practice whereas others consider it unscientific with a heavy emphasis on a statistical and more managerial approach to decision making that challenges the nature of clinical expertise and clinical decision making. Practicing evidence-based laboratory medicine has four dimensions: (a) identification of the question (b) critical assessment of the best evidence available, embodying the principles of health technology assessment © implementation of best practice and (d) maintaining best practice which embodies the principles of clinical audit. Application of the principles of evidence-based medicine to laboratory medicine highlights the importance of establishing the role of diagnostic procedures in clinical decision making. The discipline is crucial to creating and delivering the research and development agenda in the laboratory, while providing a foundation for the training of laboratory professionals. The continuing application of an evidence- based approach to practice will meet the quality expectations of patients.

## **7. VALUE TO ECONOMIC INDICES**

Laboratory medicine is very important in the reduction of economic implications of healthcare delivery. This is one aspect that is often overlooked by many governments in that in healthcare delivery, laboratory medical practice is usually allocated a tiny fragment of the budget coming to healthcare. Given the role of laboratory medicine in the prevention of disease and useful guidance of treatment, the economic evidence as determined by widely accepted cost-effectiveness analysis (CEA) of its utility is not in doubt. Think of what could happen if an improperly screened or unscreened batch of blood is utilized in the healthcare delivery system. However, because the consequences such as hepatitis B and C infection, HIV are not immediate, most people

may not readily appreciate the cause and effect outcomes. Hon. Commissioner, Mr. Vice-chancellor....., having extensively reviewed the role of laboratory medicine in contemporary healthcare delivery systems- the question that now comes to mind is what are the future challenges in this relationship and how prepared are we for the future?

At the global level especially in industrialized democracies, the healthcare industry is undergoing one of the most massive transformations ever seen in any industry. There will be an escalation of challenges facing the healthcare in the next few decades. Among these challenges are the proliferation of new technology and clinical information management systems, especially the utilization of shared electronic health records. Pathology service, in combination with sophisticated pathology informatics systems (PIS) is one of the major forces driving changes within the medical world through the adaptation of new technology.

In the coming decades, internal and external factors will require us to reinvent PIS for the future. These factors include both technology advances and socio-cultural factors. Pathology services and PIS will continue to lead the transformation of medical care through genomics, proteomics, tandem mass spectrometry and micro array technologies. These 'omics' technology and biomedical informatics will gradually merge and be an integral part of the deep sea of laboratory medicine.

Advances in technology, however come at increased costs to organizations and healthcare consumers. Many laboratories might not be able to afford these technologies and centralization of testing facilities will become the norm. Point-of-care testing devices will proliferate. The accuracy and reliability of these devices need to be vigorously examined.

More importantly, capturing and storing the Pathology information from these devices might be problematic; there is especially a need to differentiate results from point-of-care devices and results from formal laboratories. The introduction of a shared electronic health record and consumer informatics systems will accelerate the integration of the PIS into shared electronic health records.

These challenges will demand an increasing role of future PIS in direct patient care, through dynamic and intuitive integration. New advances in technology, such as microarray and proteomics will have significant impact not only in the delivery of diagnostic and therapeutic maneuvers, but also in the work flow of medical practice and ethos of patient care delivery. The introduction of these technologies creates a new level of clinical-pathology interaction. Future PIS will need to cater for the needs of Pathologists, Pathology scientists, Clinicians and Consumers. Hon. Commissioner, MR Vice-Chancellor....., it was to the herculean and formidable challenges x-rayed above that our dear husband, friend, brother, pathfinder and distinguished academic Late Professor Alfred Ebrukevbe Jarikre deployed his God given talents and expertise as a Medical Doctor/academic throughout most of his working life and career. In his many scientific experimentations and publications, Alfred sought to and indeed expanded the frontiers of knowledge in understanding diseases of the cardiovascular system, Diabetes mellitus and liver diseases. Laboratory medicine was his forte and his erudite scholarly submissions on carbohydrate and lipid metabolism remain enduring testimonies to his sobering intellectual exertions in the specialty of laboratory medicine. Professor Alfred Jarikre was also a trained journalist and for several years was a guest columnist at the now rested Daily Times publications. In his several writings in that



medium, he was able to bring about a seamless fusion between the town and gown in a mutually beneficial relationship. When he relocated to the Delta State University, Medical School from the University of Lagos, Medical School, it was in answer to a call to service. He was encouraged by several colleagues including the Guest Lecturer to return home and contribute to the development of higher education in Delta State, particularly Medical education. Education throughout the history of mankind has always been acknowledged as a prime mover of human progress. There is no doubt that Nigeria may never realize its full potential for development, greatness, peace, unity and concord if her citizens are denied the chance of a true and genuine education. A former DG, UNESCO once said and I quote "only when the purposes of education have been defined will it be appropriate to turn to its content, partners, beneficiaries, methodology, funding and other educational demands." Chief Obafemi Awolowo in the course of an address to a Union of Teachers in Ibadan in 1947 said that "Education is that process of physical and mental culture whereby a man's personality is developed to the fullest." Some 46 years later in 1993 DR Federico Mayor, DG, UNESCO went further to say that "Education is not only instilling knowledge, but awakening the enormous creative potential that lies within each of us, enabling all of us to develop to our fullest potential, and better contribute to the societies in which we live". (Address to the International Commission on Education for the Twenty-first Century)

As a young undergraduate at the University of Ibadan, one of my earliest recollections of Convocation or Commencement ceremonies as Americans prefer to call them was this opening sentence by the various Deans ie "the following persons having been found worthy

in character and learning". The emphasis was first and foremost on character. Reflecting on the state of education today in Nigeria- it would appear to me that what today's youth who are completing secondary schooling and embarking on higher education need are moral compasses and navigational charts and principles by which to live and act if we must avoid an imminent social upheaval. The place of character training in our young people cannot be over-emphasized- this imperative has been captured in a UNDP publication titled **INVESTING IN THE FUTURE** in which it is stated that experienced political leaders know that they must go beyond the economic and psychometric views of education and deal with its fundamental ethical and human dimensions. As was noted by Dr Samuel J Cooke at the second Obafemi Awolowo Foundation Dialogue in 1994 – what we need today are not merely literate leaders and citizens. Goodness knows we are not short of graduates of all kinds. We have them everywhere. What we require are men and women who have moral stature, and whose actions are based on noble principles. An all round education, including character education will broaden the minds of our young citizens and produce truly patriotic Nigerians who will ensure that in future, characteristics like personal greed, tribalism, ethnicity, bribery and corruption and intolerance of all colorations will be dethroned.

I am deeply gratified, to bear testimony to the fact that Prof. Jarikre's efforts in this regard were largely rewarded, have not been in vain and today the DELSU Medical School is on course and cruising at the right altitude. On a day such as this, I remember Alfred with a lot of pride and gratitude for the times shared, the pains and frustrations endured and the challenges that were overcome. I therefore urge all of us here, to lead our lives and render

selfless services to mankind so that it will also be said of you at the end of your odyssey on earth, that a good doctor, teacher, researcher, husband, father or mother passed through on this side of the great divide. Permit me in all humility to recommend for your contemplation the immortal words of Epictetus – a first century AD, Greek stoic Philosopher who wrote and I quote "what wouldst thou be found doing when overtaken by death? If I might choose, I would be found doing some deed of true humanity, of wide import, beneficent and noble. But if I may not be found engaged in aught so lofty, Let me hope at least for this- what none may hinder, What is surely in my power-that I may be found raising up in myself that which had fallen; learning to deal more wisely with the things of sense; working out my tranquility and thus rendering that which is its due to every relation of life. If death surprises me thus employed, it is enough if I can stretch forth my hand to God and say; "The faculties which I received at Thy hands for apprehending this, Thine

administration, I have not neglected. As far as in me lay, I have done Thee no dishonour. Behold how I have used the senses, the primary conceptions which Thou gavest me.

Have I ever murmured at aught that came to pass or wished otherwise? Have I in anything transgressed the relations of life? For that though Thou didst beget me, I thank Thee for that Thou hast given; for the time during which I have used the things that were Thine it suffices me. Take them back and place them wherever Thou wilt. They were all Thine and Thou gavest them me".

If man departs thus minded, is it enough? What is life is fairer or more noble? What end happier than this?

Hon. Commissioner, MR Vice-Chancellor, distinguished Ladies and Gentlemen, thanks for listening and being part of this modest effort, to do honour to the memory of a dear departed colleague. May the soul of Professor Alfred Ebrukevbe Jarikre continue to rest in peace with God, our Creator. Amen