

Laboratory Services and the Quality of Medical Care

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ISBN: 978-978-8088-49-3

Typeset and edited in Nigeria by
BookBuilders • Editions Africa
2 Awosika Avenue
Bodija Estate
U.I.P.O. Box 20222
Ibadan, Oyo State
Telephone: 234-2-810-1113 • 0805 662 9266
email: bookbuildersafrica@yahoo.com

Printed by Oluben Printers, Ibadan
mobile: 0805 522 0209

Sometime in July 2007, a long-lost friend asked me to attend a grand round in a 'five-star' hospital that had recently been restored to medical excellence, courtesy of the Federal Government of Nigeria. I had precisely five hours notice about which I lamely protested, knowing full well that our bonds of friendship, at least in scientific pursuits, would compel me to attend. After a few phone calls to cancel previous commitments (even retired professors do have appointments!), I found my way to the meeting, albeit fifteen minutes late, and expected the meeting to be in full swing. Clearly, I was mistaken as the hall was only about a third full, the participants were still straggling in and the organizer of the round was 'very busy' trying to fix the multi-media projector. Another twenty or so minutes went by during which I had a chance to renew some old acquaintances, many of whom I had not seen for several years (the vast majority of the participants were medical students, who must have been in primary school, at the time of my retirement from the institution!). Finally, the meeting got under way. Here is what I can remember of the story.

A child, about ten years old, was the case to be discussed. A young doctor's request for blood at night had been 'rejected' by the 'laboratory scientist' on duty at the blood bank. The doctor reported this to his senior who then contacted the laboratory. The 'scientist' relented and cross-matched the blood. The patient already had an intravenous line. The young doctor duly wrote up the transfusion instructions. Sometime later, when he found that the instructions had not been carried out; he was informed that the

'matron on duty' had said that the blood should not be given! The consultant was now informed who then talked to the matron and the blood was finally transfused to this patient. The patient was being treated with a cocktail of anti-cancer drugs for a lymphoma which had been diagnosed from a biopsy taken from a large recurrent lump in the patient's neck four weeks earlier.

Initially, the patient had been seen several months earlier at a private hospital where an excision biopsy of a lump in the same area had been done. The sample had been 'thrown away' however as insignificant, and the patient and parents 'reassured' that nothing serious was amiss.

The presenter gave a clear and scholarly description of the clinical presentation, the classification and treatment of lymphoma was obviously taken from a late 20th century edition of an oncology book; he concluded by saying that he would leave the 'administrative problems' encountered in this case to the general discussion! This discussion was, however, hampered by the fact that there were no representatives from the blood bank, nursing services or the general administration of the hospital on the grand round. The discussion centred on the role of the laboratory in diagnosis, the clinician/laboratory interface in patient care, the cooperation or lack of it between various cadres in patient management, documenting date and time in patients' records, and the need for 'guidelines' for various aspects of patient care, especially blood transfusion — which explains why I was summoned to attend this round.

The second scenario is not as dismal. The patient was a 61-year-old physician, who had taken out a worldwide medical insurance from a famous British company when he was just under 60. He had lost a few colleagues in their late fifties or earlier as a result of a variety of cancers, including, prostate and breast — both of which are curable with early diagnosis and treatment. The strong association of prostate specific antigen (PSA) with prostatic

cancer has made a big difference in the early diagnosis of prostate cancer, which had been notoriously difficult to detect. Our subject therefore, decided to enroll himself for regular PSA screening.

The problem, of course, was that only a few centres in the developing world were capable of performing reliable and accurate measurements of this tumour marker. The starting value of 3.5 ug/l was alarming to the patient, but he was reassured by his doctors. Later in the same year it rose to just over 5 and then declined to the starting level. About three years after the initial monitoring, there was a rather steep rise to just under 6.0 ug/l. In spite of further reassurance by the urologist, the patient insisted on transrectal ultrasound (TRUS) guided punch biopsies.

Six standard samples were taken. They were reported as showing focal active chronic prostatitis; there was no evidence of malignancy. Ten months later, after a further rise of PSA to 13, and again at the *insistence of the patient*, the biopsy procedure was repeated, this time eight samples were taken. Two of these indicated a Gleason grade 3+3 prostatic carcinoma. The report had an added note as follows: 'The previous TRUS biopsy has been reviewed and the findings of focal chronic inflammation, and no evidence of PIN or invasive carcinoma are confirmed'. It was, incidentally, a different consultant histopathologist, but the same pathology laboratory.

With further detailed tests which included MRI, and bone scans, the disease was adequately characterized and staged. After discussions with the urologist on the treatment options, the patient chose to have a radical prostatectomy. Starting with a haemoglobin level of about 16 grams per deciliter, the patient was 'haemodiluted' during the operation and his postoperative haemoglobin fell to 8.6 gm/dl. He required no transfusion and his hospital stay lasted just six days. The PSA level, as expected, fell dramatically over the course of the next few months and has

remained barely detectable four years post-treatment. The PSA levels are shown over time in figure 1.

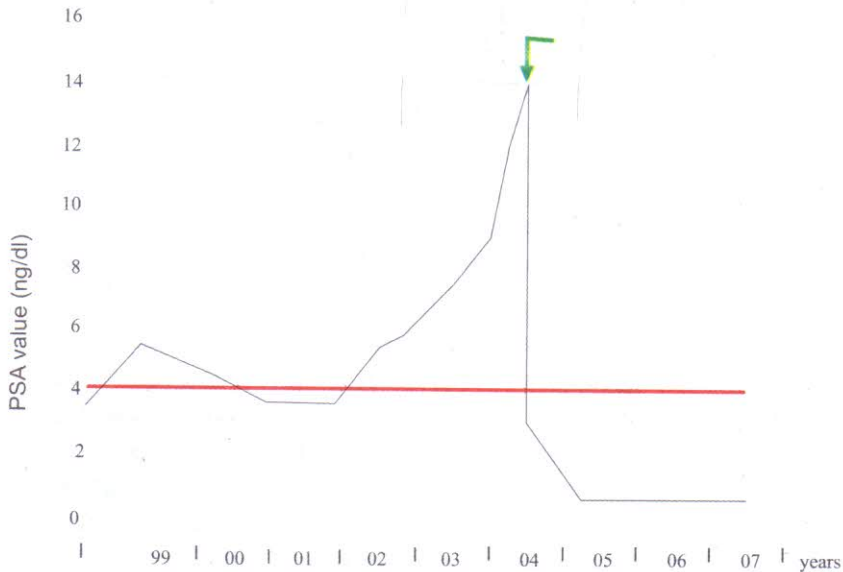


Figure 1. The PSA levels of a 60 year old patient.

Note: The green arrow indicates the time when the radical prostatectomy was performed.

Several aspects of this patient's case contrast with that of the first. Significant among these are the ability of the patient to discuss with his doctors and influence the course of the investigation and treatment and the obvious difference in the ability to keep and retrieve records, aspects that impinge significantly on the quality of the services rendered. A lesson can be drawn by every adult male from this case. This is the need to have regular diagnostic

check for indicators that are helpful in making an early diagnosis of ailments, including prostate malignancy. It must be emphasized that the results of such tests must be accurate and the quality assured so that the individual can make an informed decision about therapy and management.

I would like to present one more case. An approximately 40-year-old pharmacist presented at a teaching hospital with an ulcerated lump in his chest close to his sternum. Two years earlier he had presented with smaller lump in same place in his chest at a different teaching hospital. He remembered that it was a bit painful. He treated himself with pain relievers and antibiotics and felt better. He also thought the lump 'reduced' and so he happily 'forgot' about it. However, the lump continued to slowly increase in size. He thought his scratching the 'top' of this lump a few weeks earlier may have resulted in the ulceration noted at presentation. That the ulcer did not heal and the fact that he had also started to feel weak and more lethargic than usual did not bother him much, since he was still able to cope with the heavy demands of his job as a representative of a major pharmaceutical company. Apart from the large ulcerated lump in his chest and mild anaemia, there was not much wrong. Investigations including a biopsy of the lesion were done at the initial hospital. The biopsy of the lump and a bone marrow aspirate were reported to contain increased numbers of plasma cells, though no quantization was done on the latter. The slides were not sent with the patient. The serum proteins were said to be normal, but electrophoresis was not done. The suspicion was that he had some form of myelomatosis.

The patient initially refused referral to another medical centre of excellence, hoping that the wound would heal and the lump disappear. He then engaged the services of 'alternative' practitioners, especially the much acclaimed 'men of God' who flaunt their powers of divine healing on radio, television, and in the newspapers and other media. When he finally accepted the

referral to another medical centre of excellence, he arrived in a weakened state with moderate anaemia and a large ulcerating lump in the upper sternum. Biopsies and cultures of the lump were taken, as well as a bone marrow aspirate. For some unexplained reasons, the results of the cultures were never received, and the biopsy histology and bone marrow aspirate reports took well over one week to surface. Even then, they were non-committal in the sense that a definitive diagnosis was not made, but a number of alternatives were given. The patient deteriorated rapidly. After about four weeks, he was taken away from the hospital against medical advice. It was reported that he died a few weeks later at home, following prolonged high fever and rapid wasting.

The stories of the three patients presented thus far share several commonalities that are germane to the topic of this lecture namely they needed high quality and timely laboratory services for diagnosis and treatment of their conditions and their management. The milieu in which their diagnosis and treatment took place, gives us some insight into the quality of the various medical services. All three patients eventually ended up in tertiary medical facilities, however, elements of primary and secondary orthodox care, as well as alternative therapy— a rapidly expanding area of medical services in this and other countries — are evident here.

Laboratories have, for a long time, been part of scientific endeavour. The pure sciences of botany, zoology, physics, and especially chemistry, were the early users of laboratories, where discoveries were made that have revolutionized human thinking and enterprise. Laboratory science was not much used by medical practice until much later, partly because of its origins in folklore, superstition and even magic. The major divisions of medical practice into physicians and surgeons occurred early, demarcating in somewhat clear terms the practitioners that used mainly medication from those that performed operative procedures. With advances in the late 19th century, especially the introduction of the microscope, doctors began to examine tissues in detail and

stains were developed to further enhance and facilitate this process, thus allowing for structural differentiation. Advances in chemistry led to the development of simple chemical tests to measure the percentage of metabolites like sugar and protein in the urine, soon to be extended to the blood (serum). After microorganisms were seen with the microscope, it soon became possible to culture and characterize them using enriched media. The doctors who undertook these tasks came to be known as pathologists.

A consideration of the dates of origin of organizations catering for the major medical disciplines emphasizes the relative youth of pathology. Thus, the Royal College of Physicians of London received its royal charter in 1518; the Royal College of Surgeons of England in 1800 (as the Royal College of Surgeons of London) although it traces its origins to the union of the Fellowship of Surgeons and the Company of Barbers by Henry VIII in 1540 to form the Company of Barber-Surgeons. By contrast, the Royal College of Pathologists is a neophyte having received its charter only in 1962. The College of American Pathologists is somewhat older; it was formed in 1946, as an offshoot of the American Society of Clinical Pathologists established in 1922.

Defining pathology to the non pathologist and more so to the non medical is not an easy task. The motto of the Royal College of Pathologists: 'Pathology, the science behind the cure'— says it succinctly, but only a few would understand the ramifications of this précis. In a recent report of the *Review of the Pathology Services in England*, pathology was described as comprising:

. . . those services which provide knowledge and diagnostic information for the care of individual patients through the scientific analysis of specimens of blood, fluids, tissue and other samples.

Realizing the circumscribed nature of this definition, the reviewers were quick to add that pathology (laboratory) services constitute an essential element of clinical services through the contribution they make to the effective prevention, detection, diagnosis, treatment and management of disease, especially chronic diseases; the surveillance of infectious diseases; the provision of specialist diagnostic services, including forensic analyses which are increasingly important in judicial processes and in some countries (though not in England); the provision of blood transfusion and tissue transplant services. In addition to all these, practitioners of this neophyte discipline (pathologists) have to liaise and consult with the patient's doctors about which tests are the best tests to order, the test results and appropriate possible treatment. In other words, in addition to providing laboratory services, pathologists also carry out assignments that are loosely described as clinical. It is no wonder, therefore, that many consider the subject title 'pathology' as outmoded and have replaced it with 'laboratory medicine'.

In the beginning, the first pathologists practised all the areas of the discipline. With rapid advances, however, there has been fragmentation into the specialties of histopathology, medical microbiology (initially called bacteriology since bacteria dominate the subject), chemical pathology, haematology, blood transfusion (married by convenience in British-type practices because of the interests of early practitioners), and immunology. Nowadays, there are several sub-specialties of each and even entirely new ones that time does not permit me to discuss.

These advances also meant an increasing workload, such that it became apparent that the doctors were spending inordinate amount of time doing very mundane tasks such as mixing stains and manufacturing broth and other media for the culture of bacteria. The natural progression was to engage assistants, with little formal education, who could relieve them of the more tedious tasks. Thus another profession was born! The profession

referred to here is medical laboratory technology/science. I shall have more to say about this and other professions and careers in the medical laboratory science later on.

A considerable part of the services offered by laboratories and pathologists takes place behind the scenes, and in increasingly secluded areas. True, there are interactions with colleagues as in consultations referred to earlier, or with patients as, for example, in phlebotomies, fine needle aspiration (FNA) or bone marrow aspiration and biopsy. Only in rare cases do patients come to the hospital principally to see their pathologist. The pathologists are the plain clothes detectives of yesteryears as compared to the 'mobile' and other more easily visible sections of the 'Force'. Consider for a moment that a multi-disciplinary team, consisting of surgeons, radiologists, radiotherapists, medical oncologists, nurses, physical therapists and medical social workers, is considered the best practice for the treatment of breast cancer. (table 1).

Table 1. Breast cancer multidisciplinary team*

Member	Role(s)
Radiologist	Mammography, ultrasonography, CT Scan, MRI
Surgeon	Biopsy, lumpectomy, mastectomy, reconstructive surgery
Radiotherapist	Tumour & metastasis irradiation
Medical Oncologist	Chemo- and adjuvant therapy
Nurse	Drug administration, other nursing services
Physiotherapist	Physiotherapy
Medical Social Worker	Social aspects

* Modified from www.medscape.com. The role of pathology in multidisciplinary treatment of breast cancer. Downloaded 10 / 10 / 2007.

The pathologist is the invisible member of that team, the centrality of his role notwithstanding. Without the diagnosis (table 2) the others might as well be play acting!

Table 2. The role of the pathologist in breast cancer diagnosis*

Histological type
Degree of invasiveness
Hormone receptor status
Molecular pathology
Second opinion
Slide/tissue retention and review

* *Source:* See note under table 1.

In Nigeria, the proverbial police pathologist was well known in days gone by, as he usually had the last say in matters referred to the coroner. Rather than enhance the standing of the profession, they were derisively referred to as 'laku-laku'— meaning those who cut up corpses. If there was a scale of *glamour* for medical specialties, pathology would rank low. Thus, many people are oblivious of how pathology contributes to good medical practice by providing definitive answers to puzzling problems. In spite of this fact, pathologists and other scientists working in laboratories account for a reasonable share among those awarded the Nobel Prize in medicine — a clear demonstration of the effectiveness of their work in moving scientific medicine forward.

As the work of laboratories began to increase in variety, complexity, and quantity, the laboratory assistants took on additional tasks like cutting and staining tissues, growing bacteria in petri dishes and urine microscopy. It soon became obvious that these assistants needed additional training for a higher standard of performance. Helped by the pathologists, informal classes were organized so that those who had developed special skills could

teach the younger ones with an emphasis on practical training, supplemented later on by a modicum of theoretical knowledge. The education became more structured when groups of assistants began to band together to improve their situation. Thus, in the United Kingdom, the Pathological and Bacteriological Assistants' Association was formed in 1912. In the 1960s, the name was changed to the Institute of Medical Laboratory Technology (IMLT), and more recently to the Institute of Biomedical Science (IBMS). Its main function has always been educational: approving training institutions, conducting examinations and issuing certificates of qualifications recognized by employing authorities. The development of this professional cadre has been closely mirrored in other countries including Nigeria.

The backbone of any laboratory service is the workforce. This workforce has evolved considerably and now comprises several professional groups (for England) summarized as follows:

- a. Medically qualified pathologists who provide direction, interpretation of results and direct patient care; having membership of the Royal College of Pathologists and being registered with the General Medical Council;
- b. Clinical scientists who provide direction, interpretation, and advanced scientific expertise, usually having membership of the Royal College of Pathologists and being registered with the Health Professions Council;
- c. Biomedical scientists who provide the core of the bench work associated with pathology, and are registered with the Health Professions Council;
- d. Medical technical officers who provide higher technical support and include as a distinct group, anatomical pathology technologists;
- e. Medical laboratory assistants who provide technical assistance (some of which may be shared across disciplines);

- f. Cervical cytology screeners who provide technical support to the national cancer screening programme and to cervical cytology in general;
- g. Phlebotomists who undertake venepuncture and (in some areas) other haematology investigations or point of care testing;
- h. Administrative and clerical staff who undertake a wide range of support roles.

The terminology and the roles in the above summary have been largely adopted in Nigeria. Significant differences include, but are not limited to, the existence non medically qualified staff who work as consultants in university teaching hospitals, but at the level of state government hospitals these positions do not exist. Likewise, non-medically qualified consultants are not currently registered nor registrable with any health regulatory authority because of the absence of a national equivalent of the Health Professions Council (UK), which is responsible for regulation and registration of several health professions excluding medicine, and nursing and midwifery. Rather, what we have are separate regulatory councils for radiographers, medical laboratory scientists, physiotherapists, etc. There are tremendous implications of the heterogeneous and complex nature of the workforce for planning, management and control of laboratory services even in countries with long traditions.

In Nigeria, the 'I am better than my neighbour' syndrome has led to unhealthy quarrels and rivalries that have sometimes paralyzed the services or impaired the training of professionals. In terms of leadership, the debate about the role of non-medically qualified scientists in teaching hospitals in general, and in the clinical laboratory departments in particular, which erupted in the seventies does not appear to have been satisfactorily resolved; these clinical scientists still do not function outside the medical

schools, even though they could offer valuable services in selected areas of government hospitals. More recently there has surfaced a professional war between the pathologists and the medical laboratory scientists on what the roles of the two groups should be in the laboratory services. A similar though not so widely publicized problem has also surfaced between radiologists and radiographers.¹

However, it appears to me that a conflict of laws and a lack of mutual respect lie at the root of the problem. Whilst the pathologists rely on the Medical and Dental Council of Nigeria (Amendment) Decree (Act) of 1993, which vested in the council the control of medical laboratories, the laboratory scientists cite the Medical Laboratory Science Council of Nigeria Act 11 of 2003 as giving their council the same authority exclusively. Even as this dispute remains unresolved,

*. . . members of the Association of Hospital Medical Health Attendants of Nigeria have cried out against shoddy treatment meted to them on daily basis by doctors, nurses, lab scientists, pharmacists and other healthcare providers in our different health institutions. . .*²

All professionals working in laboratory services are essential and perform an important function for the smooth running of the hospital, particularly in the area of accurate diagnostic needs of patients. However, history and experience have shown that the best services are rendered when they are led by consultants, hence the adoption of this mode in most, if not all, countries. Such consultants have traditionally been medically qualified, but they

¹ The crux of this problem is beyond the scope of this paper.

² Ayo Ajayi, Nigeria: Rivalries hinder health service. AfricaNews.com. 20 August 2007.

now include, in advanced countries, an increasing number of highly trained scientists. Nigeria would almost certainly in the end opt for this time-honoured system, since reinventing the wheel would be unrealistic.

This is not to say that the system does not need review. In fact it is imperative that reviews be periodically carried out even when the system appears to be working well. Many countries do not have the complex workforce arrangements that we have copied from the United Kingdom, although in others, like the United States the professional cadres are more specialized (*see* table 3).

Table 3. Professional grades and certificates in laboratory services (ASCP)

Certifications are offered in the following categories	
Technicians	Apheresis Technician, AT (ASCP) Donor Phlebotomy Technician, DPT (ASCP) Medical Laboratory Technician, MLT (ASCP) Histotechnician, HT (ASCP) Phlebotomy Technician, PBT (ASCP)
Technologists	Medical Technologist, MT (ASCP) Blood Banking HT (ASCP) Chemistry, C (ASCP) Cytotechnologist, CT (ASCP) Hematology, H (ASCP) Histotechnologist, HTL (ASCP) Microbiology, M (ASCP) Molecular Pathology, MP (ASCP)
Specialists	Hemapheresis Practitioner, HP (ASCP) Blood Banking, SC (ASCP) Chemistry, SC (ASCP) Hematology, SH (ASCP) Pathologist's Assistant, PA (ASCP) Microbiology, SCT (ASCP) Cytotechnology, SCT (ASCP) Virology, SV (ASCP) Laboratory Safety, SLS (ASCP)

The 'promotion ladder' of the technologist starts with bench work from which he may graduate to 'supervisor', and finally to 'laboratory manager'. He may also join a teaching programme where he starts as a teacher and may ultimately become a 'programme director'. In all of these situations, he is responsible to the pathologist who is always the head of the laboratory. Should he enter a research career, he would progress like any other researcher on the career ladder of the organization he has joined.

Several factors make workforce reviews necessary or even mandatory. These include advances in technology, like automated instruments and point-of-care testing equipment and other clinical and scientific advances, and genetic profiling and the increasing commitment of medically qualified pathologists in multidisciplinary teams, like the one for breast cancer referred to earlier. In every case, the best care that can be offered to the patient must be the core of whatever changes are to be effected and should only be done after extensive and detailed consultation and debate.

From small beginnings, the number, variety and complexity of tests performed by laboratory services have increased exponentially, especially in recent times. For example, it is estimated that in England alone over 500 million biochemistry and 130 million haematology tests are performed annually; more than 50 million microbiology requests are processed and over 13 million histology and over 4 million cytology slides examined. The blood transfusion services process more than 20 million requests.

Comparative figures are not available for Nigeria, but all laboratory workers testify to the increasing workload. This is in spite of the fact that the proportion of patients making alternative practitioners their first port of call is rapidly rising. One of the cardinal features that distinguishes orthodox, ie, Western medicine from alternative medicine is the use of laboratory investigations to diagnose and follow treatment; and 70-80% of these decisions

involve the results obtained from the laboratory. In this respect, it is good to note that 100% of a sample of 126 hospitals distributed over seventeen states of Nigeria had laboratories.³ This is often clearly stated in their signboards, in addition, of course, to the more common 'ultrasound scan and X-ray'.

Stand-alone laboratories, ie, those not attached to a hospital or a clinic are a relatively recent phenomena in this country. Only two of such establishments were found in Ibadan when a survey of medical laboratory services in Western Nigeria was conducted some years ago.⁴ Today, they are a dime a dozen in Ibadan, as any observant motorist would notice while driving from Total Garden roundabout to Adeoyo Hospital. The zonal distribution of blood banks and laboratory scientists in Nigeria is shown in table 4, while table 5 shows the number of private blood banks in some states.

Table 4. Zonal distribution of blood banks in Nigeria*

Zone	Total No	Functional	Non-Functional	Lab Scientists
North West	137	27	112	190
North Central	122	58	64	198
North East	58	36	22	107
South East	72	10	62	122
South South	159	13	146	298
South West	76	19	57	401

* Compiled from Report of Baseline Survey on Blood Transfusion Practice in Nigeria. Federal Ministry of Health, March, 2007.

³ E.A. Elebute, Organization and integration of private health care sector in health care delivery in Nigeria. Paper presented at the Nigerian Academy of Science Health Systems Research Workshop, November 2007.

⁴ GJF Esan and TAOAdesina, 1973.

The figures were extracted from a survey conducted last year by the National Blood Transfusion Service. It is important to note that this survey asked questions about blood banks only, since we know that only in rare cases do medical laboratories claim specialization, like the one that recently advertised DNA testing, following the disclosure of requirements in the will of a famous Nigerian politician. It can reasonably be assumed, however, that the private blood banks also offer general medical laboratory services. Indeed, some medical laboratories offer a 'complete medical check-up — price on application'. These laboratories are usually owned and manned by single laboratory scientists with the aid of assistants of variable qualification and experience.

Table 5. Private blood banks in some states

Anambra	150
Kwara	14
Ondo	9
Ogun	42
Imo	76
Niger	115
Plateau	76

Source: Same as table 4.

The legality and standard of these enterprises have recently come under scrutiny with the result that 36 in Edo State, 34 in Abia and 35 in Anambra were reported to have been 'closed down' by the Medical Laboratory Science Council of Nigeria⁵ The

⁵ Chukwuma Muanya, Council shuts 105 labs in Anambra, Abia, Edo. *The Guardian* (newspapers), 11 November 2006.

survey also showed that a large proportion of the blood banks are not functional for various reasons (*see* table 4).

The distribution of laboratory scientists is uneven, with the largest concentration in urban centres in the southern states, where presumably there exist clientele able to pay for their services. Unfortunately the survey did not provide information about consultant staff.

Test requests to a laboratory service can be divided into three clear phases. The pre-analytic phase begins with the 'order' or request that must be written in an appropriate manner — ie, a correct request form, adequate clinical information to enable suitability of the test and correct interpretation of the results, etc. Next is the sample collection. Blood is usually collected by phlebotomists and must be drawn into the right container in correct amounts. Thus, a sample in sequestrene is useful only for haematology analysis but not for blood sugar, and samples for coagulation studies must be adequately mixed in the correct proportions of anticoagulant to the blood for the results to be meaningful. Arterial blood for blood gases must not be drawn from veins if correct results are to be seen. The sample must be transported to the laboratory with dispatch and with appropriate temperature control, etc, as samples may deteriorate during transportation. Finally, the sample may need to be separated and put in a different container on arrival in the laboratory.

In the analytic phase, the specimen may be put through a series of steps — sampling, mixing with reagents (often timed), at the same time the laboratory technician observes and measures any changes in the physical characteristics of visual or ultraviolet light absorbance or the staining of tissues with various reagents. A great number of these processes are now automated with clinical chemistry leading the way, followed in turn by haematology, medical microbiology and histopathology.

Finally there is a post-analytic phase in which the results are recorded, interpretative comments are added when necessary, and then transmitted to the requesting physician.

With so many steps to follow, it can be seen that errors can easily occur along the line, unless there is a strict and continuous process of monitoring and control; with the use of automated instruments and information technology, these errors can be reduced considerably.

The cost of laboratory tests varies considerably between and within countries. In computing these costs, personnel emoluments, instrumentation and reagent costs, and cost of ancillary services like transportation and IT support, must be considered. There is hardly any published data on the costs of laboratory services in Nigeria, but it is known that the costs differ between the government and the private sector and within the sectors, the private being generally the more expensive, although not necessarily better. By contrast, data from the more advanced countries show the costs of routine chemistry and haematology to be similar in the USA (89 cents), the UK (87 cents) and Australia (88 cents). Significant cost differences are seen with regard to more complex tests, viz \$13.00 (US), \$26.00 in Australia and \$32.00 in Britain.⁶ I suspect that costs are lower in South Africa, which may explain their increasing use by Nigerian establishments of laboratories in that country for tests that were previously sent to Europe.

Laboratory services are now an indispensable facet of Western medicine. They should therefore be available at all levels of health care delivery, which, in Nigeria, are grouped broadly into primary, secondary and tertiary levels. There must be very few, if any, primary health centres with laboratories. By contrast, most secondary health care facilities have some provision for

⁶ All costs have been converted to US currency.

laboratories, although they are mostly non-functional. In the tertiary hospitals, services are available, however it would appear that the 'ward laboratories' (or 'side-room labs' as they were sometimes called), are no longer fashionable. They certainly made a great contribution to patient management and diagnosis, eg, amoebic dysentery by stool microscopy, demonstration of pneumococci in cerebrospinal fluid and megaloblasts in stained peripheral blood.

I recall how my consultant castigated me, when I was a lowly pre-registration house officer, for using emetine hydrochloride a new treatment that was then undergoing clinical trials, to treat amoebic dysentery. The patient was the 22nd admission for the night to the unit. In ten of these, I had seen and preserved amoeba in the stools for demonstration at the ward round the next morning. The patients were also from the same large family household in some inner part of Ibadan. I had reasoned that since the last one came from the same location and had typical clinical features, and it was now close to five in the morning, I could assume the diagnosis and proceed with treatment. I had expected to be lauded for my assiduousness in examining the previous stools, in addition to performing two lumbar punctures for suspected meningitis that proved negative on the slides I had done in the side room.

Clearly, I was wrong and deserved what I got. In medicine, it is not how many times you are right that is important, the fate of the patient may be determined by a single mistake the doctor has made. In another case, I was happily rewarded when I forced the laboratory to change the diagnosis in a patient with severe anaemia by showing to the great Dr. Watson-Williams (as he then was) megaloblasts in the peripheral blood of the patient that I had prepared in the side room. These had been missed in the slide made by the laboratory, but were now seen on further review after seeing my slide! These side-room tests were a great educational tool for the students and residents.

It is not often realized that patients can be taught to perform simple laboratory tests to help themselves to manage certain chronic conditions. For example, a person with diabetes should be taught to use a glucometer, since it is known that complications of diabetes mellitus are significantly reduced by monitoring glucose levels in the blood. Teaching diabetic patients how to use a glucometer will significantly reduce episodes of ill health in these patients. Similarly developments in anti-coagulant control have reduced the long queues in anticoagulant clinics and the patients are maintaining a healthy status with reduced complications, simply by being able to measure their international normalized ratio (INR) using simple instruments in their own homes.

The introduction of the portable 'breathalyzer' for measuring alcohol levels in the breath — as a surrogate to measure blood alcohol levels — has led to an increase in the detection of cases of DUI (driving under the influence). Public education and the use of personal equipment has considerably reduced accidents attributable to the effects of alcoholic drinks. The Nigeria Police and the Federal Road Safety Commission ought to initiate these tests in this country.

Everyday, each of us makes quality assessments, sometimes verbal sometimes mental. Thus, when we see a smartly dressed student or a pretty lady, a beautiful car or a well-groomed horse, we continually assess and make comparisons between these and others we may not regard as reaching the standard we have set consciously or otherwise. Quality is, therefore, about standards. Some standards, like the turn around times of laboratory tests, are easily defined, while others, like the specification of a 'Formula-One' racing car are much more complex. In this country, the nomenclature and 'rating' of hospitals and health care facilities are somewhat haphazard. Although we have adopted primary, secondary and tertiary to describe the levels of health care facilities, we frequently change names at will even when the situation remains essentially the same. For example a general

hospital may transform into a state hospital, or a basic health care facility may become a general hospital, simply at the whim or caprice of a governor. A famous head of state once remarked that our hospitals have become mere consulting clinics!

Tertiary hospitals have been designated centers of excellence *by fiat*. One health minister wanted to transform some institutions into 'five-star hospitals' using the hotel rating scale, whilst *The Nation* (newspaper) on November 27, 2007, reported how an alumnus gave reasons '*Why 'AA' Rating May Elude LUTH*', this time using the financial rating scale.

Performance measurements of the Nigerian health care system have been undertaken in a rather limited way. Data on broad aspects of the health system, like maternal and infant mortality rates, immunization rates, life expectancy at birth, human development index etc rank Nigeria among the lowest in the world.⁷ A number of efforts have been made to improve this situation, including the recent 2007 workshop by the Nigerian Academy of Science on Health Systems Reform. In her presentation⁸ at that workshop, Lola Dare listed a number of options that could be adopted to enhance performance. These include the integration of professional regulations, changing mindsets (so that leadership will be by tasks), and breaking down the professional 'ivory towers' so that there will be far more collaboration than currently exists. Dr Dare stated that professional associations should be encouraged to adopt the integrated work-force approach to regulation and standards, which must be established and monitored. They should adopt a professional rather than a trade union approach. Civil society must actively participate in testing innovations, brokering knowledge,

⁷ See WHO world health report by country at www.geographic.org.

⁸ Performance monitoring and management in health systems.

tracking accountability and strengthening the dialogue of inclusive partners.

The quality of services provided by a health care organization whether a hospital, primary health care centre, or a health maintenance organization has been defined as:

*... the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge.*⁹

The quality of medical care can be measured by using performance indicators, often locally developed and based on routinely collected data or those from surveys. These indicators have become more sophisticated with the use of health informatics, and in the United Kingdom, these are now being linked to the pay of general practitioners. The somewhat dramatic improvement in the quality of medical care provided by the Veterans' Health Administration (VHA) of the United States is another example of the value of monitoring performance and providing appropriate incentives to improve quality. In the early 1990s the VHA acquired a reputation for providing inferior services, but within ten years of introducing a programme of monitoring performance through the use of selected indicators, it is now held to be one of the best health care providers in the United States.

Since an unhappy patient suggests poor quality care, it is important to take the view of patients into serious consideration in any assessment of quality. A hospital that is not 'patient friendly' must therefore examine its structure and processes with a view to

⁹ Institute of Medicine, Washington D.C., 2001.

effect necessary changes. For a variety of reasons, including subjectiveness, measuring patient satisfaction may be difficult, hence it is now being replaced with reports of patients' experiences, eg, waiting times at clinics, loss or misplacement of records, delays in reporting laboratory investigations, etc. The quality gap between what is optimal and actual practice may be due to several factors, many of which are outside the control of the doctor. These include public resistance to measures designed to improve health care like the refusal to take vaccinations, and problems of design and financing of health care systems. The owners of the institutions may sometimes also want to play to the gallery, neglecting the obvious because they appear less glamorous. If we adapt the terminologies and techniques of accreditation organizations that have proved useful elsewhere, we too should be able to effect the changes we desire.

In considering laboratory services, the writing of the standards against which we want to use quality indicators might appear a bit easier because many of the results and services generated, already exist as a statistical record, eg, the number and variety of tests performed and the accuracy of individual tests or runs. This notion, however, is not correct. The published 'Standards for the Medical Laboratory' of the United Kingdom is a 57 page document that begins with a short historical review, defines the terms used, and covers the following areas:

- a. organization of a quality assurance system
- b. personnel
- c. premises and environment
- d. equipment, information systems and materials
- e. pre-examination process
- f. examination process
- g. post-examination process
- h. evaluation and quality assurance

In simple terms, we can assure the accuracy of individual runs by including a standardized control sample called the internal quality control (IQC). Furthermore, we can ensure inter-laboratory comparability of results by requesting several laboratories to perform the same test and compare their results. Because the sample originates from outside the laboratory's system, this is called external quality assurance.

The development of standardized reagents and samples has been led by the World Health Organization whilst the International Standards Organization has set the standards for the processes and products. The WHO has developed a standard haemoglobin material, which laboratories can request to calibrate their equipment. A number of commercial manufacturers are marketing this material, so it is readily available for laboratories. Such tests are meant to be routinely run once or more every day, depending on the number of samples processed in the laboratory. The Levi-Jensen plot of the values is then made to see how the results differ from the 'correct' one. As with other aspects of medicine, 'No Controls' means 'No Conclusions'. Laboratories which fail to run standardized tests to calibrate their instruments cannot guarantee that the values generated by their tests are accurate — such values must be regarded as suspect. One occasionally hears of the failure to procure internal control materials in laboratories in this country; given their importance, this situation should NEVER arise.

External quality assurance (EQA) schemes usually have local or regional arrangements for the exchange of samples so as to compare the results between laboratories. Several have evolved into worldwide schemes covering qualitative, quantitative and interpretative investigations in the general and specialist areas of clinical chemistry, haematology, microbiology, immunology and anatomic pathology. Their primary aim is educational. Participating laboratories are provided with independent and impartial

data on the standard of performance of their routine services. This enables them to review this information in conjunction with their internal quality control (IQC) and other materials in order to take corrective action when necessary. These external quality assurance schemes offer advice and assistance to laboratories having difficulties. Participation in recognized EQA schemes is required for accreditation, but not for licensing purposes.

A few of the very many organizations offering external quality assurance schemes includes the schemes of the College of American Pathologists (perhaps the most famous), with over 4000 participatory laboratories. The United Kingdom National External Quality Assurance Schemes (UKNEQAS) comprises about 30 schemes and sub-schemes and is operated from a network of 20 organizing centres; it covers the UK, the European Union and other countries across the world. The best known of the purely commercial EQAs is probably RIQAS organized by Randox. It has an enrolment of over 5000 laboratories in 59 countries with a programme of 156 analytes. A smaller scheme operates in Poland and is run by the Polish College of Laboratory Medicine in cooperation with Labquality of Finland; it provides assessment services for 200 medical laboratories. The College of Physicians and Surgeons of Alberta, Canada has 239 public and independent laboratories enrolled. Japan is peculiar when compared with other developed countries in having two parallel schemes: one run by the Association of Registered Clinical Laboratories (presumably consultant-led) and another by the Japanese Association of Medical Technologists' External Quality Survey Program. The latter programme includes 'Clinical Physiology'. A Nigerian 'export' to the Kingdom of Saudi Arabia pioneered one of the most successful EQAs in microbiology in the developing world starting with only two laboratories. Within a few years, the scheme has grown and now covers all the major laboratories in Saudi Arabia; other disciplines are now trying to start their own quality assessment schemes. All the EQAs have to charge fees to

cover staff emoluments, the preparation and distribution of the samples and results, data analysis, and visits to laboratories persistently returning poor results.

Quality assurance forms an important component in laboratory accreditation exercises, when the performance of the laboratory is examined in its totality and in great detail. Trained external assessors are expected to inspect the facilities to:

- watch the workers perform their duties for several days
- inspect records not only of work done, but of errors made and how they are reported and investigated
- assess the availability of relevant manuals on safety and procedures for fire drills, accidents, etc.

These assessments are measured against a set of published exacting standards that are regularly updated. Being accredited means that the laboratory has joined the elite group whose results, products and processes can be trusted anywhere in the world.

Accreditation organizations are independent bodies even though they frequently draw their membership from associations and scientific societies. The Clinical Pathology Accreditation (CPA-UK) is a limited liability company run by a board of directors with a number of representatives nominated by the following organizations:

- Royal College of Pathologists (3)
- Institute of Health Care Management (3)
- Institute of Biomedical Science (2)
- Association of Clinical Pathologists (1)
- Association of Clinical Chemists (1)
- English Community Care Association (1)

There are observers (one each) from the Independent Health Care Advisory Services and the Departments of Health of England, Scotland, Wales and Northern Ireland provinces of the UK. The company works in partnership with the United Kingdom Accreditation Service (UKAS), which is the equivalent of the Standards Organization of Nigeria (SON).

Some of the constituent bodies, though not all, have Nigerian counterparts — the Faculty of Pathology of the National Postgraduate Medical College of Nigeria is comparable to the RCPATH; an amalgam of the Association of Medical Laboratory Scientists of Nigeria and the Medical Laboratory Science Council of Nigeria is a near equivalent to the Institute of Biomedical Science (IBMS); and the Association of Pathologists of Nigeria (ASOPON), is Nigeria's equivalent to the Association of Clinical Pathologists and Clinical Chemists etc. The stated aim of the CPA-UK is to provide a means to accredit clinical pathology services and external quality assurance schemes. Through her services, the company ensures that the needs of ALL interested parties are met (figures 2 & 3). This system recognizes what I have tried to emphasize earlier namely the multiplicity of stakeholders in the laboratory service of any health system. There is, therefore, no way the regulation and especially the evaluation of the quality of services can be assigned exclusively to just one association or stakeholder. Laboratory services are not and must not be treated as monopolies; to do so is to foster chaos and confusion with the attendant results of inefficiency and ultimately disaster.

Until very recently, there were no organized quality assurance schemes operating in Nigeria. At least two previous attempts to introduce and market RIQAS for clinical chemistry were unsuccessful, partly because of the cost and the lack of awareness of the necessity for such schemes. At a seminar on Quality Improvement Issues in Laboratory Services in Nigeria organized by the Institute of Genetic Chemistry and Laboratory Medicine in

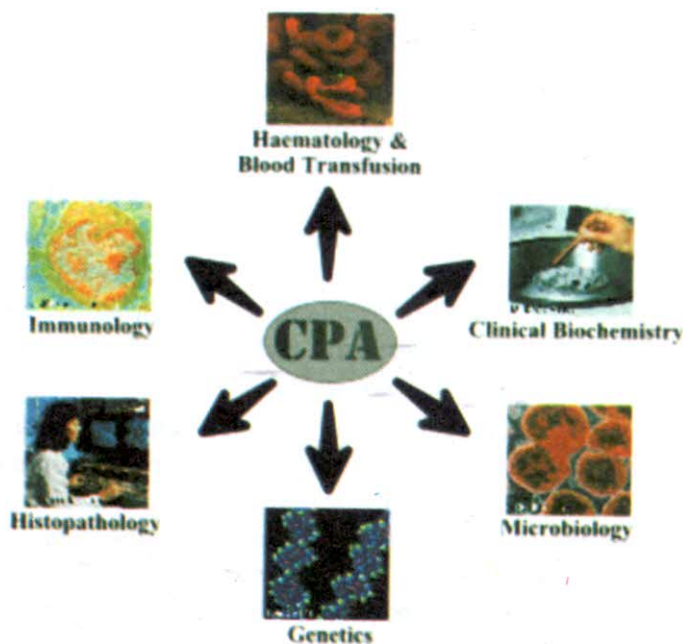


Figure 2. Services of the Clinical Pathology Accreditation Company.

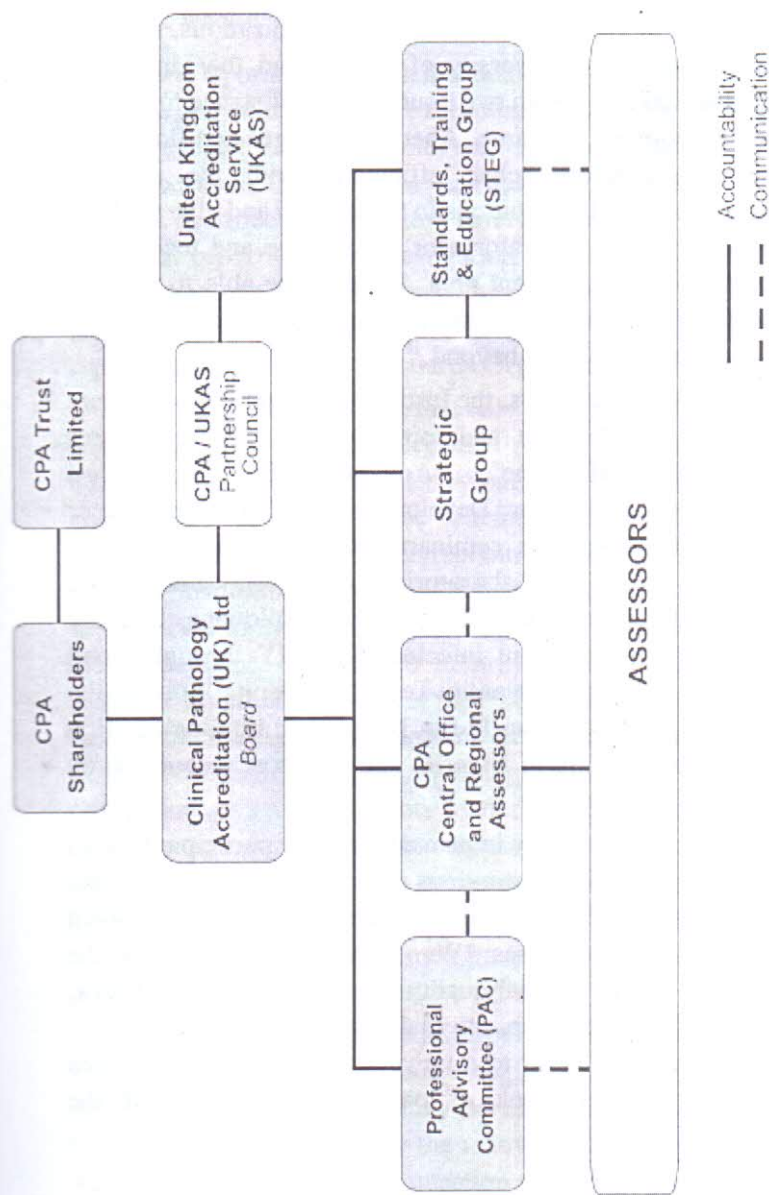
Ibadan in 2004, the organizers were shocked to discover that the participants had little or no hands-on experience of laboratory performance evaluation and quality improvement issues.

An offer by the Institute of Genetic Chemistry and Laboratory Medicine to start, on an experimental basis, a scheme to include the teaching and specialist hospital laboratories in our catchment area was enthusiastically received, but remains on the drawing board as only one institution has so far confirmed its financial ability to participate. The Institute's geographic restriction is dictated by obvious logistic reasons, while the institutional restriction is due to the methods and equipment used. Private laboratories with adequate instrumentation will be invited to participate; however, we are aware that by far the majority still

use outmoded manual methods. The Medical Laboratory Science Council of Nigeria has recently launched a scheme that is compulsory and free. Apart from the fact that 'there is no such thing as a free lunch' — this appears to be like asking the accused to judge in his own case. If the council desires to improve laboratory services and wishes them to subscribe to EQAs, it should make this a condition for whatever authority it wishes to exercise. However, to go ahead and declare itself as an assessor is going too far. This activity should be left to independent bodies, as is the case in virtually all the countries of the developed world. The Institute of Genetic Chemistry and Laboratory Medicine in Ibadan is one such independent institution

The Science and Technology Development Foundation, a registered non government organization, set up the Institute of Genetic Chemistry and Laboratory Medicine (IGCLM) in 2004. Its beginnings lie in the well-known successful cooperation between the Departments of Chemistry and Haematology of the University of Ibadan, dating back to the sixties. The Institute's mission is to develop a research centre of excellence in genetic chemistry and laboratory medicine where scientists would be able to pursue research activities at a high level on the frontiers of knowledge studying the local genetic resources of humans, plants and animals. The Institute intends to develop a scientific and research capacity in a multidisciplinary environment that will promote appropriate responses to Nigeria's and Africa's most pressing health problems and expand collaboration with advanced countries.

Our research activities will be based on working groups in selected focus areas of pure and applied chemistry in the understanding of biological systems and laboratory medicine. Each working group will be headed by an outstanding researcher able to mobilize research associates, postdoctoral fellows and students, as well as operational funds and equipment from competitive grants from foundations, and contract research for



This diagram includes CPA / UKAS Partnership Council, however it is not intending to suggest that the Partnership Council or UKAS are directly accountable to the CPA shareholders.

Figure 3. Clinical Pathology Accreditation (UK) Ltd.

client agencies of government and private organizations. Located midway between the University of Ibadan and the University College Hospital and within two hours driving distance to Ile-Ife, Osogbo, Ogbomoso, Sagamu, Abeokuta, Lagos and Ilorin, the Institute can therefore relate efficiently with the science, technology and health institutions in these cities and also serve as a reference research laboratory for the science and technology community in this catchment area. It would be able to provide resource facilities and an independent quality assurance laboratory for these communities and beyond.¹⁰

Over the last three years, the Institute has conducted seminars and lectures on important and topical issues. These lectures included 'Nano-Medicine', 'Advances in Stem Cell Transplantation' and 'New Developments in Prostate Cancer Research'. The Institute's seminars included two on Quality Improvement Issues in Laboratories in Nigeria (the second focused specifically on Blood Transfusion, (following the Baby Eniola episode — an infant infected with HIV through blood transfusion — in Lagos University Teaching Hospital); one on the 'Scientific Aspects of Avian Flu in Nigeria' (following the first outbreak of that disease in Nigeria) and the most recent one on 'Diabetes and Metabolism'.

The seminars on quality improvement drew participants from all parts of Nigeria. The institutions represented include teaching and state hospitals, federal medical centres and private medical laboratories and enterprises. We found that several of the laboratories used no internal quality controls for their analyses, and none participated in an external quality assurance scheme. Indeed, an external grant to a university department had been suspended because of lack of participation by one of the

¹⁰ Details of our infrastructure, management and logo, are available on our website: www.igclm.org.

associated laboratories in such schemes. By far the majority did not have standard operating procedures (SOPs) for their analyses to ensure that different technologists followed the same procedures and processes. There were no designated quality assurance manuals or officers. Laboratory safety officers were non-existent and error reporting and investigation was at a rudimentary level in only one or two institutions. International and local resource persons were highly rated by the participants and included a representative from the Standards Organization of Nigeria.

It was depressing to note that only one or two laboratories had practicalised the knowledge gained regarding SOPs and IQCs, when the seminar was repeated a year later. None had enrolled in an external quality assurance scheme. We therefore offered to assist in writing SOPs (on contract) and planned an EQAs. So far, only one institution has said unequivocally that it would be willing to subscribe to the scheme — the remainder are still looking for the funds, since they agree in principle to subscribe! It was blatantly apparent that none of the laboratories that participated in these seminars could have meet the stringent accreditation criteria of the College of American Pathologists or that of UKAS. This conclusion says a lot about our leaders, who in one breath loudly clamour that we maintain international standards, while in the same breath, condone our apparent inertia to rise above the present malaise in health care (*tiwa n' tiwa* ie, 'this is our own thing'). This reflects a common problem in Nigeria: the lack of political will to get our priorities right.

Let me now return to the issue of consultation and debate that I mentioned earlier in discussing the plethora of the work-force in the laboratory services. It may be that professionals in Nigeria have become so numbed by the many years of military rule that we have lost the ability to question our rulers and to insist on proper consultation. In the so-called civilian era we are occasionally called to attend a legislative hearing. The notices are published in a few newspapers, usually only a few days in

advance of the hearings. I had an interesting experience with one of such hearing not too long ago. The Lagos State Government was considering a law to regulate blood banking in the state and the house of assembly wanted some input from interested parties, who were given precisely five days to submit memoranda and attend the hearing. I saw the advert in a newspaper that I purchased at Murtala Muhammed Airport on my way out of Nigeria, I thought it was futile to attempt to make any submission. My passion, however, got the better of me and I found myself composing my memo as soon as the aircraft settled into its cruising height. A day after my arrival in London, it was finished and I somehow got it to the correct address in Lagos the next day — no mean feat since there was no electronic address. By the time I returned to Nigeria one week later, I was greeted with banner headlines in the newspapers that the draft bill had been passed and signed by the governor! The law turned out to be a fair one, but can the legislature in true conscience claim to have consulted widely on, and debated this bill? What was the 'emergency' that necessitated the rush? There have been several others, however, in which after a rushed hearing, the bill has been kept in limbo for long periods in the various legislative committees of government.

Policy proposals fare better, but only just. The government usually assembles a panel of experts who are given an impossibly short time to formulate the initial draft. Most of these experts are selected on their own recognizance and may not be the best representative of that particular field. They meet, thrash out the points among themselves and make a submission to government; this is reviewed in the ministry and a memo is prepared posthaste and sent to the executive council and presto, a new policy is in place.

A very nice example occurred in the Federal Ministry of Health which, for various reasons, wanted to put in place a policy on laboratory services. An ad-hoc team, headed no doubt by a

very renowned Nigerian scientist was constituted. This expert working group (EWG) approached their assignment by adopting a process of group meetings and consultations with stakeholders on laboratory services. They also made requests for memoranda from local government areas, state governments, federal agencies and professional associations involved in laboratory practices and/or providing laboratory services. A three-day workshop was then organized at the end of which a draft policy and implementation plan were agreed. The list of participants attached as an appendix to the draft document showed that nine members of the EWG and 33 others attended. Eighteen others were listed under the heading 'invited but could not or did not attend'. Very significant among those who did not attend was the representative of the Association of Pathologists of Nigeria! The whole exercise took about 3-6 months.

A similar exercise was conducted in England recently where a committee, chaired by a member of the House of Lords, was established. In carrying out their assignment, they adopted the following strategy: placement of advertisements in national newspapers inviting memoranda (about 200 were received) and identification of and meeting with a wide range of individuals and organizations with an interest in the policy being formulated. The list of these two groups is eight pages long. They visited several laboratories in England. They also went to the United States of America, two countries in Europe, as well as Australia in order to obtain first-hand information for comparative bench-marking of the services. The report was then submitted to the Minister of Health who then published it on the ministry's website as well as sent it round to stakeholders for further debate and comments. I came across it because the Royal College of Pathologists drew the attention of its entire membership to it in a quarterly letter from the president.

Quite clearly, the quality of the two reports will be and are different. I am not necessarily recommending a wholesale

adoption of the English *modus operandi*. We can learn from it, however. When the people are consulted and can claim part ownership of the policies, they are unlikely to acquiesce when they are peremptorily reversed. It may also be true that the proportion of Nigerians able and willing to make an input into policy issues may be small, but they should still not be neglected.

* * * *

I was privileged to meet Professor Osuntokun in school way back in 1951. He was probably one of the cheerleaders that made us sing the national anthem of Siam (now Thailand) in Siamese language-O WHATANAS SIAM- to the tune of 'God save the King', our 'national anthem' as a colonial people. We, the new arrivals in school, sang lustily to demonstrate how committed we were to learning new things which, after all, was the reason for being there. At the end of the singing, we were told that the words we sang translated to 'O what an ass I am' which was probably true! Over the years that we spent at Christ's School, Ado-Ekiti, we were moulded to become the best. He certainly was not one of those prefects who insisted that others stand and wait at the foot of a three-yard wide staircase whilst they descended, to otherwise avoid colliding with the climber, who would then have committed a grave offence, worthy of punishment (detention). He must have chuckled when in February 1951 we carried the student with the best school result in the Senior Cambridge certificate examination held the previous year—credit in all subjects – shoulder high for a triumphant ride nearly three miles from Ado town to Christ's School, then on the outskirts of the town. He probably already knew this 'record' would be replaced by his own of nearly straight 'A's.

The setting of records and standards for others to emulate is one of Kayode Osuntokun's most distinguishing characteristics.

From his precocious reading of the Holy Bible 'from cover to cover' at age six, through the school certificate results just referred to, his sterling performance in sports and academics at the University College, Ibadan and throughout his entire career, and even in his last days faced with what must have been obvious to him, there is a catalogue of inimitable records of unparalleled excellence. He was always ready to help others to follow in his footsteps and thus improve their performance.

I am a living example of this aspect of his life. I was one of the guinea pigs in a class admitted to UCI in 1956, when it was decided to phase out the intermediate bachelor's examination. The ten of us admitted through the concessional entrance examination were simply added to those of our seniors in year 2 to attend the same classes and take the same inter-BSc at the end of the session. The only way I was able to overcome this problem was that Oga Kayode voluntarily gave me his notes in Zoology. They showed that he wrote down almost all the lecturers' words including Dr Margaret Hills's "this is the first of a series of five lectures on the phylum Arthropoda" which was spoken in a very high pitched tone. Incidentally he was able to mimic this flawlessly.

He loved cars, and his 'brilliance' in stuffing an incredible number of us in his Kharman Ghia and driving us safely back to the Clinical Students' Hostel (now Alexander Brown Hall) has been remarked upon at this podium. It did not matter what degree of inebriation we all were in, he always drove well. On one occasion, however, he was prevented from driving. A number of us were returning in his car from a meeting in Lagos and we had to call on the great Chief Simeon Adebo in Abeokuta. The first question Chief asked was which one of you is driving? Kayode playing a prank, pointed to me. I was then made to sit directly opposite the chief who offered me orange juice, whilst the others had their choice of rare whiskies or brandy. Chief Adebo ensured that I was actually the one driving when we left him and he gave me a parcel to take home. To Kayode's consternation, I refused.

to relinquish the driving to him after a few miles and when we were well away from the view of the Chief. My parcel from Chief Adebo turned out to be a bottle of whisky.

I was not a particularly good driver, but I must have impressed him because a few months later he let me drive him from Ibadan to Enugu to attend a meeting of the Association of Physicians of Nigeria. Our subsequent journey to Enugu was uneventful except that we had to return early because Enugu at that time had virtually no electricity supply (it was only a few months after the end of the civil war); he could not stand the darkness there. With his statement which I remember clearly today, "the darkness you know is better than the darkness you don't know," we returned to a less dark Ibadan on the third day. It is sad to remark that the Enugu darkness we ran away from is now the norm in large tracts of our country nearly forty years later.

He spoke glowingly of his ancestry, especially the warriors of Okemesi. I remember how he used this topic to banter with my dad on the occasions he came to my house to medically assess him (he always insisted treating him at home so as not to bother the old man by bringing him to the hospital). The opening went some thing like this: The Okemesi son has arrived, descendant of the people who slapped the Ikoro, floored the Ajero with a push on the chest etc. My dad would reply: Okemesi people are none other than evil-eyed pokenosers who should let others do their own thing.

His love of Nigeria and the University of Ibadan system, including the hospital, was legendary. It has been reported how, despite all the juicy offers, he refused to 'leave for greener pastures'. However, he felt justifiably slighted when a cyclostyled and stapled letter showed up on his desk when he was Chief Medical Director of UCH. There had been a sudden and unexpected change in government policy which required that

officers in the public service retire compulsorily after 35 years. Because he had 'merged his service' it was calculated that he attained that status two years earlier and was deemed to have retired then! This episode, ie, phraseology of that letter and the way it was delivered, sans envelope, was to me the greatest act of lack of grace a seat of learning could commit. Fortunately for the system, the policy was quickly reversed, but I doubt if any apologies were ever tendered.

During this same period, he expressed puzzlement at how the people of Ibadan, from where 80 – 90% of the patients treated in UCH originate, simply went about their business without concern, when the hospital was shut down for six weeks as a result of a strike action arising from an industrial dispute with the doctors union! Several years later I doubt if the situation is any better. Compare this with the daily demonstrations in front and around UCH London several years ago when the UK government proposed closure of that hospital. The display of placards like 'Save Our Hospital', 'UCH: No to Closure', etc continued without pause until the policy was reversed and the hospital was re-opened and is functioning till today

He was prepared to stand up to any authority when he knew he was right. When he told a college student at school in front of a teacher who was adjudicating their quarrel to "tell the truth and let the devil be ashamed" the teacher misunderstood him and said he, the teacher, had been called a devil and therefore would punish Kayode. When attempts to explain to the irate teacher failed, he went direct to the school principal who solved the 'problem' by educating the teacher. He did the same when, by force of superior arguments, he forced the Federal Government to reverse a policy decision to admit 1000 students per year to the medical schools in Nigeria when he was Dean of the Faculty here.

It is now more than ten years since Oga Kayode left us. That the memorial lecture has been held continuously since that time

reflects the esteem in which his memory is held. It also shows the hard work of the people entrusted with the running of the Trust and I commend and thank them for this. I pray that these activities designed to make us remember him, especially the lectures, will be in perpetuity. Perhaps they will not mind suggestions of other activities that may be carried out in between lectures. Independent study reports on quality performance in some of those areas in which he was so much a cut above the rest can be commissioned and published. Such studies could focus on aspects of teaching hospitals and how well they are fulfilling their mandates, design and application of quality indicators for health care in Nigeria, use and misuse of services e.g. laboratories etc. One of these studies could result in the adoption of a rating scale of which one unit of excellence could be named after him and applied to a system the quality of which he enhanced or promoted its quality. Finally, we must remember that Kayode was as comfortable in the basic sciences as he was in the clinical areas. In this respect, he was a foremost bridge builder of this famous divide; perhaps future lectures and other activities will emphasize this more than hitherto. Whatever is the case, I am convinced he would have approved the hymn Ancient and Modern No 235 as modified by the Institute of Genetic Chemistry and Laboratory Medicine on the Board of which he would have been invited to serve were he still with us today. Here goes:

QUALITY HYMN FOR LABORATORIES (A&M 235)

Enhancing QUALITY

My outward vesture be

Promoting EXCELLENCE my inner clothing

True EXCELLENCE of work

Reaching for higher heights

And o'er its own shortcomings

Weeps with loathing