

¹Appriaisal of Biomedical Engineering Technology Transfer in Nigeria

In Nigeria, though biomedical engineering (bme) is gradually being given its rightful place as a professional discipline as is obtained in developed world, this has not been translated to every facet of health system. For instance, whereas the Tertiary and some secondary public health institutions have established bme units and depts, many private, some public secondary and all primary health institutions are yet to delineate any unit or dept for bme. This is despite a recent govt approval of a scheme of service for bm engineers and technicians.

We know that in the world over, medical advancement is propelled by bme which in turn depends on the level of the nation's technological development. Although, Nigeria's technological development cannot be said to be currently in the lowest ebb, its being hindered by many of the factors that have caused Nigeria to remain in the group of developing nations. These factors include poor budget allocation to health, limited access to healthcare technologies, lack of appropriate healthcare technology management (HTM). These factors constitute a serious issue for developing countries not just Nigeria. And they affect their technology development in general and thus the development of bme and technology.

We are interesting here in the clinical setting of bme or clinical engrg because it currently holds the greatest prospect for bme professional practice over the career areas like academia, research & development, industry and govt. The clinical setting is found in the healthcare centers where you have three levels: primary, secondary and tertiary. The primary healthcare has the health centers and maternity homes at its level. At the secondary healthcare level are the State General and Central Hospitals, some Faith-Based and Private Hospitals. Finally the tertiary level of health care system includes the Federal and State Univ. Teaching Hospitals, the Federal and State Specialist Hospitals and the Federal Medical Centers. Our case study here is Palmer Memorial Hospital where I worked as Medical Officer b/w the years 2005 and 2006.

Palmer Memorial Hospital is a Faith-Based (Missionary) Hospital established by the Church of Christ and located at Ikot Usen in Ibi-ono Local Government Area of Akwa Ibom State. It is a 35-bed capacity hospital composed of the male, female, children, maternity, private and isolation wards as well as emergency room. The clinical units there include the nursing, in-patient-wards, the out-patient units (including ante-natal care), the surgical (theatre) unit, laboratory unit and pharmacy. Other units in the hospital are the laundry / sterilizing unit, business office, administration and works unit. The hospital

has two doctors' quarters and a number of staff quarters, a guest house and a power house with two standby generators. The staff strength is 37 composed of two doctors, fifteen nurses and twenty other staff.

The hospital has no established engineering unit but there is a works unit composed of the power house, carpentry section and labourers. There is no bme or instrument staff and no electrician so major electrical and equipment repair works are contracted out.

A good number of bm equipment is available in the hospital and for ease of review is categorized into three with respect to their state of function as follows:

- a. *In-use Equipment*—these include two mercury in glass and four aneroid sphygms, thermometers, stethoscopes, some beds, a foreign donated theater light, two adjustable examination couches, some sets of surgical instruments, a wheel chair, a trolley and a mobile drug dispenser.
- b. *Dis-used Equipment*—one locally made theater light, an autoclave machine, two suction machines, a wheel chair, some beds, and two examining couches.
- c. *Un-installed Equipment*—a mobile X-ray machine, a washing machine and an autoclave machine.

Most of the equipment in all three categories are donated from overseas, facilitated by Christian missionaries. This means that Palmer Memorial Hospital like most Nigerian hospitals is engaged in *Assisted Technology Transfer* ie. across a national boundary. Yet many of these technologies are *not appropriate* to the needs of the hospital. For instance, some of the beds and couches actually came in a state of dis-use.

The other aspect of this type of technology transfer is that they are not carefully assessed before adoption into the hospital. As an example, all the un-installed equipment have been lying in the hospital for over ten years. There is no trace of manual for the X-ray machine nor plan for training of medical / technical manpower for its use. And the hospital does not have the financial capacity for installation.

This review typically depicts the dependence on equipment donation in health institutions in Nigeria. This is a classical example of a very inappropriate technology transfer occurring in developing countries of the world. So we in Africa and other developing countries of the world owe it to our countries to educate them and insist on appropriate bme technology transfer.

Dr Kenneth I. Nkuma-Udah, FCBET, PhD

Medical Engineer and Doctor

Managing Editor, Afr J Med Phy, Biomed Eng & Sc