UGMS RESEARCH Newsletter

Volume 2 December, 2013

ACTING DEAN'S END-OF-YEAR MESSAGE

Prof. Jennifer E. Welbeck

As the year gradually draws to a close, I wish to place on record my appreciation for the contributions of all members of the UGMS Family, both staff and students towards the growth of the School during the year 2013.

A big thank you for your tireless efforts in small and big ways to ensure that UGMS continues to stand tall in the College.

With the beginning of the 2013/2014 academic year, we were challenged to contribute our quota to the upcoming restructuring of the College and the large University body. The task ahead of us is not easy and it will also lead to a lot of movements for all of us as our roles change, our departments change etc. As we all know, change is not easy to accept but I believe with the right attitude and with all of us together at the wheel, we are bound to succeed. Sacrifices will also have to be made by each and every one of us as we try and reduce waste in the system – of resource, of time etc.

To both staff and students let us, with a positive attitude to work and with commitment and dedication positively impact our lives and those lives we come into contact with every day.

Management will endeavour to reciprocate with different forms of motivation as appropriate as we continue to build a formidable institution.

As we enter the festive season, let us not lose sight of the reason for the season, the coming of Christ to save mankind. In our enjoyment and during the rest period let us endeavour to be better individuals in the year 2014 than we have been in 2013.

Best wishes for the season.

Merry Christmas and a Happy New Year!

Prof. Andrew Anthony Adjei
Editor in Chief

Editorial

Welcome to the Volume 2 of the University of Ghana Medical School, College of Health Sciences Research Newsletter. We lead in this issue with a focus on Research Activities at the Centre for Tropical Clinical Pharmacology and Therapeutics, as well as focusing on some research achievements of our colleagues. Research is one of the main objectives of universities world-wide and it is the door to the creation and development of new ideas, knowledge and technology. The universities in developed countries such as Europe, United State of America and Japan have recognized this fact, particularly the invaluable services rendered by clinicians, biomedical scientists and post-graduate students in terms of research and teaching and therefore have put attractive incentive packages to motivate, recruit and retain them. In view of the above, it is gratifying to note that UGMS has reconsidered the value of scholarships in terms of research and has provided separate building with facilities for the promotion of research among the senior members, senior staff and post-graduate students. It is also heartwarming to learn that UGMS is considering innovative ways of funding for basic, applied and medical research. It is our belief that this is one of the veritable ways to bolster research within the Medical School.

As the year draws to a close, may I take the opportunity to express my profound gratitude to the members of the UGMS Research Newsletter Committee, the Research Committee for their immense support and "immunological" tolerance displayed towards the establishment of this Newsletter and the growth of research during the year 2013. I believe I can count on them in 2014 to achieve the mandate and goals of the Research Office. On behalf of the members of the Research Committee, the Editorial Staff and on my own behalf, I wish you Merry Christmas and a Prosperous New Year. May God perfect, establish, strengthen and settle you for 2014.

Comments on the Newsletter or suggestions for future editions should be forwarded to the Research Office: research@ugms.edu.gh

More information on the School and latest development can be accessed through the School website: www.ugms@edu.gh

Research at the Centre for Tropical Clinical Pharmacology & Therapeutics

Front view of CTCPT

Background

The Centre for Tropical Clinical Pharmacology & Therapeutics (CTCPT) is a research and clinical department of the University of Ghana Medical School (UGMS). The Centre conducts multi-disciplinary research and training in all aspects of clinical pharmacology. The current research activities of the Centre are based on clinical studies, employing a range of pharmacometric, pharmacogenetic, pharmacoepidemiologic and laboratory investigations, to improve drug therapy of communicable as well as non-communicable diseases. The CTCPT is a designated WHO Collaborating Centre for Advocacy and Training in Pharmacovigilance, and is part of the Pharmacogenetics for Every Nation (PGENI) Initiative – a collaborative genotyping and data mining project aimed at integrating genetic database information into public health decision-making.

Ongoing research activities at the Centre are categorized into thematic areas below:

I. Malaria Chemotherapy Research:

a) Clinical trials and in vivo/in vitro antimalarial drug efficacy testing: These involve clinical trials for *in vivo* therapeutic efficacy and monitoring of resistance to antimalarial drugs in sentinel sites across Ghana. The *in vivo* data are complemented by *in vitro* testing to determine susceptibility of clinical isolates to antimalarial drugs. The objective of the studies is to provide up-to-date efficacy data on first-line antimalarial drugs to enhance timely, evidence-based decision-making by the National Malaria Control Programme. The studies are being done in collaboration with colleagues from the Noguchi Memorial Institute for Medical Research (NMIMR), and funded by the National Malaria Control Programme, and the US Naval Research Unit (NAMRU).

b) Pharmacokinetics and Pharmacodynamics of antimalarials in children with HIV or sickle cell disease: These involve the use of modelling techniques to determine pharmacokinetic/ pharmacodynamic (PK/PD) parameters of importance to presumed alterations of antimalarial drug disposition in patients with HIV or sickle cell disease, to establish whether current dose regimens are adequate for these sub-groups, or whether there is a need for dose adjustment, as clinical response in these patient sub-groups, may differ from children without these conditions. The studies are being done in collaboration with colleagues from the Department of Child Health and collaborators from University of Copenhagen, Denmark, and funded by grants from the Consultative Committee on Development Research (FFU) of DANIDA, and the University of Ghana (UGRF-ORID).

c) Malaria transmission assessment in a potential site for clinical trials: These involve establishing sentinel sites and surveillance systems to obtain accurate disease burden estimates in health facilities across the country, as a background for establishing a clinical trial site for testing of future interventions. The studies are being done in collaboration with colleagues from NMIMR, and funded by the European and Developing Countries Clinical Trials Partnership (EDCTP), through the West African Network of excellence for TB, AIDS, and Malaria (WANETAM).

II. HIV research

a) Demographic, clinical and genetic risk factors for nevirapine hypersensitivity reactions in HIV patients: The study is aimed at determining risk factors associated with nevirapine hypersensitivity reactions in HIV-infected adults, and involve estimating frequency of occurrence of specific alleles in implicated genes and relationships with selected clinical and laboratory parameters. The study is being done in collaboration with colleagues from the Department of Medicine and Therapeutics, and is funded by the University of Ghana (UGRF-ORID).

b) Post-exposure prophylaxis in health care workers in KBTH/Factors associated with regimen switch in HIV-positive patients attending KBTH: These pharmacoepidemiologic studies are aimed at evaluating the HIV post-exposure prophylaxis programme for health workers at the KBTH, and determine factors associated with antiretroviral therapy regimen switch in HIV-infected patients. The studies are being done in collaboration with colleagues from the Department of Medicine and Therapeutics, and the Pharmacy Unit, KBTH.

c) Putative protective effects of sulphamethoxazole-trimethoprim prophylaxis on malaria incidence in HIV-infected children: This study is aimed at evaluating potential mechanisms underlying the putative protective effect of cotrimoxazol prophylaxis on malaria incidence in HIV-infected children. The study is being done in collaboration with colleagues from the Department of Child Health, and collaborators from Brown University, USA, and funded by a grant from UG-brown University Academic Partnership for AIDS (UGBAAP).

III. Pharmacovigilance research

The CTCPT is involved in the INDEPTH Network Effectiveness and Safety (INESS) studies which is funded by the Bill and Melinda Gates Foundation and led by the School of Public Health, UG. The WHO Collaborating Centre based at the CTCPT is leading Africa-wide efforts to deploy electronic health records for drug and vaccine safety monitoring. Pharmacovigilance activities also include cohort event monitoring of antiretrovirals and pharmaco-epidemiological studies on medicines and vaccines in multiple sites and countries in Africa. The WHO Collaborating Centre is especially focused on research on communication in drug safety and the development and deployment of enterprise-wide risk management systems in health care delivery. The Collaborating Centre worked with the WHO country office to assist the Ministry of Health develop a manual on "Effective communication and crisis management in public health programmes in Ghana." Collaboaring institutions and funding agencies associated with the WHO Collaborating Centre include the Uppsala Monitoring Centre in Sweden, the WHO Collaborating Centre in Morocco, Medicines for Malaria Venture, the INDEPTH Network, ministries of health and departments in several countries.

IV. Drug Therapy in Special Patient Population Research

Neonatal drug therapy research

Interactions between amikacin and aminophylline in newborns with sepsis: This study is aimed at determining the effect of concurrent administration of aminoglycosides and methylxanthines or aminoglycosides alone, on outcomes in newborns with sepsis, and to evaluate the effect of the combination on selected PK/PD, and microbiological characteristics. The study is a PhD study project funded by a scholarship from the BSU Partnership and supervised by faculty from CTCPT and Department of Child Health, and University of Copenhagen, Denmark..

Anticoagulant genetics research

CYP2C9, VKORC1 and CYP4F2 variant frequencies in patients on low or high stable warfarin maintenance therapy: The study is aimed at elucidating genetic basis underlying inter-individual response variability to anticoagulant therapy in patients with a range of cardiovascular and other diseases on warfarin therapy. The study is investigating mutations in specific cytochrome P450 (2C9, 4F2) or vitamin K epoxide reductase (VKORC1) complex genes and associations with the requirement for high or low maintenance warfarin. The study is an MPhil student project supervised by faculty from CTCPT and Departments of Haematology and Medical Biochemistry.

Diabetic drug therapy in pregnancy research

Metformin versus insulin in the management of gestational diabetes mellitus and type II pre-gestational diabetes mellitus at Korle Bu Teaching Hospital: The study is aimed at establishing effectiveness of metformin alone, or metformin in combination with insulin on selected glycaemic targets and management of gestational diabetes mellitus in pregnant women. The study is an MPhil student project supervised by faculty from CTCPT and Departments of Medicine and Therapeutics, Obstetrics and Gynaecology, and Pharmacology.

V. Biomarkers of disease progression in patients with co-infections research

Antioxidant status of sickle cell disease children with or without malaria: These studies are aimed at determining the extent of changes in selected antioxidants in children with sickle cell disease and

Research staff engaged in laboratory work at CTCPT

other chronic diseases co-infected with malaria. The study is an MPhil student project supervised by faculty from CTCPT and Departments of Chemical Pathology.

VI. Malnutrition research

***Role of selected health and social determinants of malnutrition and audit of interventions to reduce the condition in moderately and severely malnourished children*:** These studies are aimed at establishing determinants of malnutrition in children with moderate and severe forms of malnutrition, at the Princess Marie-Louise Hospital. The studies are being done in collaboration with colleagues from the Department of Community Health, and funded by the University of Ghana (UGRF-ORID) and the Building Stronger Universities (BSU) initiative.

VII. Rational drug use research

Prescribing patterns and potentially inappropriate medications in elderly patients in a medical out-patients clinic in a teaching hospital: The study is aimed at describing the prescription pattern of medicines, and estimate prevalence of potentially inappropriate medications amongst a sub-group of older patients. The study is a West African College of Physicians Fellowship project supervised by faculty from CTCPT and Department of Medicine and Therapeutics.

UGMS Researcher Profile

Dr George Obeng Adjei, MD, PhD, FCP

Dr George Obeng Adjei is currently a Senior Research Fellow and, since January 2013, Head of the Centre for Tropical Clinical Pharmacology & Therapeutics (CTCPT), University of Ghana Medical School (UGMS). He holds an MD degree from the Medical University of Gdansk, Poland, a Postgraduate Diploma in Research Methodology from the Institute for Health Research and Development, Denmark, and PhD from the University of Copenhagen, Denmark. He is a Fellow of the American College of Clinical Pharmacology.

Dr Adjei is a clinical scientist with expertise in clinical research, laboratory sciences, and public health methods. His research training started immediately after completing medical school, when trained in molecular biology and immunoloy techniques at the Laboratory of Cell Biology at the Medical University of

Dr George Obeng Adjei, Head, CTCPT

Gdansk. During this period (1997-1999) he conducted research on the genetics of tumour necrosis factor in pancreatic cancer patients. He also served as Scientific Advisor to a leading Biotechnology Firm in Gdansk, Poland during this period, advising scientists and students on new biotechnological tools and biomedical research applications.

He joined the Department of Child Health, Korle Bu Teaching Hospital in 2000, as Medical Officer, and to work on a DANIDA-funded collaborative research program on malaria. He combined a heavy clinical workload with a demanding clinical research schedule coordinating, under supervision of the responsible Consultant Paediatrician, patient recruitment for various sub-studies on pathogensis of severe malaria in children. He acquired invaluable experience in clinical research during this period, and his contribution was instrumental to the program's success. In 2004, he was awarded a grant by the Council for Development Research (RUF), Denmark to undertake PhD studies (2004-2007) at the University of Copenhagen, Denmark. His PhD study, which focused on systematic clinical investigations on the effect of artemisinin combination therapies (ACT) on major organ systems, also applied a pharmacometric modeling approach to describe, for the first time, the pharmacokinetic characteristics of the ACT, artesunate-amodiaquine, in children with uncomplicated malaria.

He joined the UGMS in 2008. He was awarded an independent researcher grant by the Consultative Committee for Development Research (FFU), Danish Ministry of Foreign Affairs in 2009-2013, which enabled him to, among others, establish a research laboratory that supports a variety of research activities. He has researched on malaria, sickle cell disease, HIV, and cancer. His research interests include the application of new methodological approaches in clinical trials to improve drug therapy, particularly in children.

He has authored more than 20 full length articles in peer-reviewed high impact journals, and presented papers at local and international scientific conferences. He serves as peer-reviewer for several scientific journals, and also for funding agencies. He has served as member of an expert forum to develop guidelines on standards for reporting antimalarial pharmacokinetics and pharmacodynamics studies. He has also served as Temporary Advisor on the WHO/TDR TropIKA.net Knowledge Hub and has been a member of the National steering committee on better medicines for children. He has been Co-investigator on several collaborative research projects. Dr Adjei has also been a visiting scholar to research various institutions abroad. He teaches Pharmacology at the Para-clinical departments, and Clinical Pharmacology on the Coordinated course at the UGMS, and on the MSc Clinical Trials program at the School of Public Health, University of Ghana.

A bioecological pediatric HIV disclosure intervention in Ghana -"SANKOFA"

Dr. Lorna Awo Renner, Principal Investigator

SANKOFA HIV Paediatric Disclosure Study, which started January in 2013, is a five year NIH funded project with Yale University and Komfo Anokye Teaching Hospital. The amount for the project is about US$200,000.00 over a 5 year period.

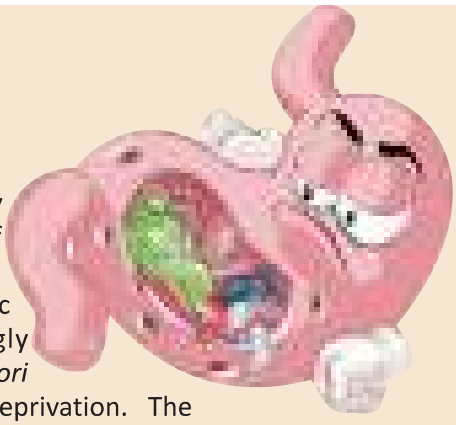
The project aims to provide information on a structured disclosure intervention that can be integrated into usual care in Ghana and other resource-limited settings to improve the welfare of HIV-infected children and their caregivers. This area of investigation is profoundly understudied and of high importance to millions of children and their families in sub-Saharan Africa. While widely recognized as vital to better health outcomes, especially in the era of better access to HIV treatment, many children are not informed of their HIV diagnosis. A variety of socio-

cultural contextual barriers and deficient skills drive the persistent reluctance of caregivers and health care providers to inform children of the diagnosis. Our preliminary work shows that several key factors can be modified and the process of disclosure promoted with an intervention approach that is grounded in a traditional Ghanaian concept, "SANKOFA", and behavioral and bioecological systems theory. The patient-centered intervention approach uses an Adherence and Disclosure specialist model where a designated specialist familiar with the socia-cultural norms of the community is well trained to target modifiable information, motivation and behavioral skills of caregivers to facilitate their engagement in the process of disclosure. The general aim is to evaluate the effect of a structured, culturally-relevant disclosure intervention to caregivers delivered by a specialist as an integral component of routine HI\; healthcare on the rate of caregiver disclosure of pediatric HIV.

The personnel of the project are:

- Lorna Awo Renner, Principal Investigator, University of Ghana Medical School
- Elijah Paintsil, Principal Investigator, Yale School of Medicine
- Nancy Reynolds, Co-Principal Investigator, Yale School of Nursing
- Angela Ofori-Atta, Co-investigator, University of Ghana Medical School
- Margaret Lartey, Co-Investigator, University of Ghana Medical School

Helicobacter pylori-related gastro-duodenal disease in Ghana



Dr. Timothy Archampong
Principal Investigator

Helicobacter pylori infection is the primary aetiologic agent in the development of gastritis, gastric and duodenal ulceration, gastric B-cell lymphoma and distal gastric cancer. Distal gastric cancer is strongly associated with lifelong *Helicobacter pylori* infection and relative socio-economic deprivation. The bacterium *Helicobacter pylori* is a spiral-shaped gram-negative urease-producing pathogen found in the stomach and in areas of gastric metaplasia in the duodenum. The exact mode of transmission of the pathogen is unclear but intra-familial clustering suggests person-to-person spread mainly in childhood. Overcrowded conditions associated with childhood poverty lead to increased transmission and higher prevalence rates. *Helicobacter pylori* is common, however only a minority of the infected develop gastro-duodenal disease therefore specific bacterial, host and environmental factors are responsible for its continued clinical expression. The best understood bacterial virulence factor is the *cagA* pathogenicity island. *Helicobacter pylori* strains possessing this factor induce more inflammation, ulceration and oncogenesis when compared with *cagA*-negative strains. Another virulence factor is the vacuolating cytotoxin, *vacA*. The bacterial strains producing more active forms of *vacA* are more closely associated with gastro-duodenal disease.

overcrowded conditions associated with childhood poverty lead to increased transmission and higher prevalence rates.

This research study received ethical approval from the University of Ghana Medical School Protocol and Ethical Review Board in April, 2010. The amount of Grant funding from ORID: University of Ghana Research Fund was 29,688.75 Ghana Cedis. The study target population were Clinical Outpatients undergoing Upper-Gastro-Intestinal Endoscopy at the Korle-Bu Teaching Hospital Endoscopy Unit, Accra. Between July, 2010 and April, 2012, a total of two-hundred and thirty nine (239) dyspeptic patients with endoscopic evidence of *Helicobacter pylori*-gastro-duodenal disease were recruited consecutively into our sample population. They were all taken through an informed consent process and completed our questionnaire. This gathered demographic and clinical data on selected patients. *Helicobacter* status was defined by Rapid-Urease-CLO testing on gastric antral biopsies. This yielded our study *Helicobacter pylori* prevalence of 73.2%. Following Upper-Gastro-Intestinal endoscopy, three systematic gastric antral biopsies per patient were stored in DNA-gard solution in the School of Allied Health Sciences (SAHS) Laboratory.

This research project therefore proposes to perform histological, microbiological and molecular assessments on gastric antral biopsies stored in DNAgard. It will provide the opportunity to carry out clinical, epidemiological, microbiologic and subsequent molecular assessments of *Helicobacter pylori* infection in patients presenting to Korle-bu Teaching Hospital, the main tertiary referral centre for Southern Ghana. It will investigate clinical and genotypic differences seen in *Helicobacter pylori* infection thereby providing compelling data on its expression in Ghana. It has also provided an opportunity for post-graduate study for an MPhil Student in Microbiology. It is expected that at the end of the project we will be able to categorize and risk stratify symptomatic patients. Molecular characterization will be done to evaluate if *cagA* and *vacA Helicobacter* strains would prove to be very ulcerogenic and carcinogenic in Ghana as reported in the developed world.

Clinical, demographic and genetic risk factors of Nevirapine hypersensitivity reaction among HIV-infected patients at Korle bu Teaching Hospital

Ghana, like many African countries, still carries the burden of communicable and non-communicable diseases. Human Immunodeficiency Virus (HIV) is one of the communicable diseases that Ghana has to control through prevention of transmission and treatment with antiretroviral therapies (ARTs). The availability of the ARTs in the public health system has greatly improved the survival of HIV-infected patients. However, these ARTs have been associated with adverse drug reactions (ADRs) which may be due to demographic and clinical risk factors. These clinical and demographic variables associated ADRs of ARTs have not been properly documented in Ghana.

Dr William Kudzi
Principal Investigator

Nevirapine (NVP) a frontline medication according to National Guidelines for Ghana leads to hypersensitivity reaction in some patients. This study examines the clinical risk factors and specific genotypic alleles that are associated with Nevirapine hypersensitivity reaction. Nevirapine hypersensitivity reaction is defined as fever or rash due to the drug and elevated liver enzymes equal to or greater t han three times the upper limit of the normal.

Antiretroviral naïve HIV patients who are initiating nevirapine-based HAART therapy will be enrolled and

clinically monitored in a case-control study over six months. DNA would be extracted from whole blood samples and will be sequenced for specific alleles. The relationship between genetic factors and risk of hypersensitivity reactions will be investigated. This research will provide data on relevant clinical risk factors and specific alleles that predisposes Ghanaians to NVP hypersensitivity reaction.

The results from this study may be useful to health care providers, policy makers, and other stakeholders in Ghana for the preemptive management HIV-related clinical complications and the prevention of HIV-related deaths.

The project received 25,000.00 Ghana Cedis as grant funding from ORID: University of Ghana Research Fund.

Nutritional Status at Diagnosis of Childhood Malignancies in Korle Bu Teaching Hospital, Accra

Dr. Catherine Segbefia
Principal Investigator

Overall cure rates for childhood cancers in developed countries now exceed 80%. Unfortunately, this success is not mirrored in low and middle-income countries (LMIC) where the majority of children with cancers live. Various factors account for the inferior outcomes in LMIC, including lack of recognition of childhood cancers as a health priority, poor health infrastructure with few specialized paediatric oncology units and trained personnel, limited laboratory facilities, missed diagnoses, poverty (rendering chemotherapy and other related healthcare costs unaffordable), delayed presentation to hospital, inadequate supportive care and abandonment of therapy. In addition, prevalent infectious diseases, parasitic infestations and malnutrition adversely influence the health status of children in LMIC.

Malnutrition is the single most important risk factor for childhood illness and is associated with about 50% of all childhood deaths worldwide. The prevalence of malnutrition in children with cancers has been shown to be higher than in the general population. This results from various disease-related factors including diminished intake (from anorexia, mucositis or vomiting), increased nutrient loss (due to diarrhea or malabsorption), as well as increased energy expenditure and protein turnover. In developing countries, the prevalence of malnutrition in newly diagnosed children with cancers may be as high as 50%. This is associated with numerous adverse consequences including reduced tolerance to chemotherapeutic regimens and decreased overall survival. Among survivors, long-term consequences of malnutrition include growth impairment, reduced final height, neurocognitive deficits, decreased quality of life and reduced economic productivity. To the best of the investigator's knowledge, there are no published studies from Ghana on the burden of malnutrition in children with cancers.

The main aim of this study is to assess the nutritional status of children at diagnosis of cancer in Korle Bu Teaching Hospital (KBTH), Accra, Ghana. Study participants will comprise children, aged 1-12 years with newly diagnosed malignancies, admitted to the paediatric oncology unit, KBTH. Following study recruitment, an investigator-administered questionnaire will be used to obtain demographic, socioeconomic and clinical information. Nutritional status will be determined using anthropometric measurements: weight, length (age < 2 years) or height (age $\geqslant$ 2 years), mid upper arm circumference (age < 5 years), body mass index (age $\geqslant$ 5 years), triceps skinfold thickness and upper arm muscle area.

Data obtained from the study will help with the development of effective nutritional strategies to prevent or reverse further nutritional deficits for newly diagnosed patients with malignancies. Identification of associated risk factors for malnutrition will facilitate the design and institution of appropriate interventions for individual patients. Clinicians caring for these children can also advocate for the establishment or improvement of nutritional support services in health facilities. This study will also stimulate further research including longitudinal studies to determine the contribution of nutritional status within specific diagnostic groups, to long and short term outcome measures such as event-free and overall survival, end-organ damage, late effects of cancer therapy and health-related quality of life

Medical Illustration - A Historical Perspective

Stanley Marcus Amankwa, BA(Art), MPA,

Stanley M. Amankwa,
Head, Medical Illustration Unit, UGMS

Medical illustration is a unique applied art discipline comprised of professional medical illustrators. It is a medical, scientific, and artistic field in which artists produce detailed visual materials in tangible or virtual medium for use in other medical or scientific fields and to convey biological information. It falls within the more general field of biomedical-communication.

The Mosby's Medical Dictionary, 8th edition defines the medical illustrator as an artist who creates visual material designed to record and communicate medical, biological, and related knowledge. A medical illustrator requires a strong foundation in biology, anatomy, physiology, pathology, general medicine, and the visual arts. Today most medical illustrators use the computer to create their work. All over the world, medical illustration units exist in teaching hospitals and medical schools with the objective of providing a wide range of cost effective clinical photography and graphic services to medical and paramedical staff, lecturers and students.

Medical drawings actually started over 2000 years ago when artists illustrated the intricate structure of the body, creating images to elucidate medical procedures and record the pathologies of the body. But medical illustration created for instruction first appeared in the Hellenic Alexandria era during the 4th century BC or early 3rd century BC. Created on individual sheets of papyrus, Hellenic illustration covered anatomy, surgery, obstetrics and plants of medical value.

Early medical illustration was inseparable from anatomy and centered on the five-figure series, with each figure representing an organ system. Later in the renaissance artists inspired by Greek and Roman statues created naturalistic representations of the human figure aided by the discovery of the laws of perspective and their own dissections of cadavers. The five-figure series gave way to more accurate representations of anatomy. Indeed the forerunners; Leonardo da Vinci (1452-1519) who painted the famous Mona Lisa, Andreas Vesalius (1514-1564), William Harvey (1578-1657), Antoine van Leenwenhoek (1632-1723) and Marcello Malpighi (1628-94) were all renowned artists as well as anatomists.

Leonardo da Vinci was identified as the first medical illustrator in the contemporary sense. Stunningly inventive, he melded a scientific understanding of anatomy with great artistic skill. Leonardo pursued his

own anatomy book, and pioneered the use of cross sections and exploded views. He presented his illustrations in a totally new perspective that showed the structural relationships of the various body organs. Lacking the temperament and resources to publish his work, Leonardo's 800 anatomical drawings remained unpublished until the 1800's. When Leonardo da Vinci died his anatomical drawings got lost and were only discovered after about four centuries. It is believed that the advancement of anatomy would have accelerated by many years if his sketchbooks had been available to the world at the time of his death.

Andreas Vesalius's contribution to human anatomy and modern medicine is immeasurable. He was a great anatomist and an artist who initiated the use of live models to determine surface land marks for internal structures. He completed his masterpiece, De Humani Corporis Fabrica at the age of 28. This book, the most well known book of anatomy ever, beautifully illustrated the various body systems and individual organs.

In the 19th century new printing techniques allowed illustrators to work in a variety of media. Color printing was refined and became practical, helping usher in color atlases of pathology and colorful anatomy books for the public.

Max Brödel (1870-1941) was an artist who made an incomparable impact on medical illustration in North America early in the 20th century. At the end of the 19th century this charming, stylish young artist was persuaded to leave his native Germany and pursue medical illustration at Johns Hopkins. Almost singlehandedly he created and defined the profession of medical illustration. While his magnificent illustration work in pen and ink, and carbon dust, a technique he devised, are an immense legacy, Brödel's most significant legacy is the first school of medical illustration. In 1911 he became the director of the Department of Art as Applied to Medicine. As an outstanding natural teacher, he trained other young artists who became apostles of the profession. Through Brödel and his graduates other medical illustration programs sprang up across the United States and Canada, and transformed medical illustration into a profession, leading to the formation of the Association of Medical Illustrators in 1945.

Anatomical sketches of Leonardo da Vinci

A drawing from Vesalius' book De Humani Corporis Fabrica

The Ghanaian Experience

I cannot end this brief history on medical illustration without a mention of our own Nii Oobo Quao (1943-2006). Quao a native of Accra, started his Medical Illustration career in the Anatomy Department of University of Ghana Medical School after he graduated from the University of Science and Technology, Kumasi as an artist. Just like Brödel who left his country Germany to study in the US, Quao also left Ghana in 1983 to the UK to study medical illustration in Robin Brook Centre for Medical Education of the Medical College of St. Bartholomew Hospital, London. Quao was a refined artist whose attention to minute details was exceptional. He distinguished himself as the first black African in the history of the College to have obtained distinction in medical illustration. For his achievement he was inducted as Fellow of the Medical Artist Association of Great Britain and a member of the Institute of Biological Medical Illustrators. While still a student at the Medical College of St. Bartholomew Hospital he was granted a scholarship to study Audio Visual Techniques as an additional discipline. Quao was also a recipient of several awards. Notable among them is the Kodak Award at the September 1985 professional exhibition at Aberdeen, Scotland.

Nii Oobo Quao became the first qualified Ghanaian Medical Illustrator. He returned to Ghana Medical School with the desire to initiate a resource centre which he intended to develop into a medical illustration school to serve the entire West African sub region. Quao's idea was accepted by the then authorities of the Ghana Medical School and incorporated in the design of the library complex building. The entire ground floor of this building which is now known as the Charles Easmon Building was originally designed to house Quao's Medical Illustration Resource Centre. Unfortunately, that was how far his dream could be achieved. A comparative analysis of Quao's situation with Max Brödel's success story reveals a rather sad conclusion of the state of medical illustration in Ghana and by extension in Africa as a whole. Whereas Brödel received all the support needed to establish the Department of Art as Applied to Medicine, Quao on the other hand had his dreams truncated as a result of lack of support. He advocated for a rise in the status of the Medical Illustration Unit he headed in order for him and other staff members to have the opportunity to become senior members. This idea was also not given any favourable attention by the university authorities.

Today, the Medical Illustration Unit of Ghana Medical School remains a small unit with inadequate capacity to handle its core mandate of supporting teaching and learning, academic research, publication and record keeping.

Looking into the future

It is my hope that the necessary support will be provided with the aim of creating a unit of high standard that is tailored to meet the need in the health care environment. The unit must be re-engineered to be self-sufficient in its operational activities towards all programmes relating to the College of Health Sciences and the teaching hospital. Acquisition of modern equipment and improved capacity is the way to go.

A rejuvenated Medical Illustration Unit is definitely a giant stride towards a better health care delivery and income generation.

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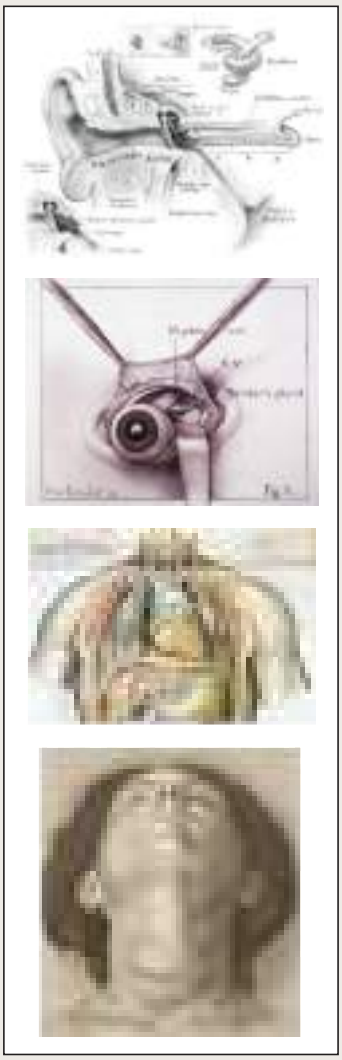
Charles Easmon Building



Max Brödel's illustrations

Nii Oobo Quao's illustrations

S.M. Amankwa's illustrations

FEATURE ARTICLE

Improved method of producing satisfactory sections of whole eyeball by routine histology

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The Department of Anatomy, UGMS presents a manual modification of routine paraffin wax method for tissue processing which produces whole histological sections of the eyeball. The abstract is as follows:

To overcome the loss of structural integrity when eyeball sections are prepared by wax embedding, we experimentally modified the routine histological procedure and report satisfactorily well-preserved antero-posterior sections of whole eyeballs for teaching/learning purposes. Presently histological sections of whole eyeballs are not readily available because substantial structural distortions attributable to variable consistency of tissue components (and their undesired differential shrinkage) result from routine processing. Notably, at the dehydration stage of processing, the soft, gel-like vitreous humor considerably shrinks relative to the tough fibrous sclera causing collapse ofthe ocular globe. Additionally, the combined effects of fixation, dehydration, and embedding at 60°C renders the eye lens too hard for microtome slicing at thicknesses suitable for light microscopy. We satisfactorily preserved intact antero-posterior sections of eyeballs via routine paraffin wax processing procedure entailing two main modifications;

(i) careful needle aspiration of vitreous humor and replacement with molten wax prior to wax infiltration;

(ii) softening of lens in trimmed wax block by placing a drop of concentrated liquid phenol on it for 3 h during microtomy. These variations of the routine histological method produced intact whole eyeball sections with retinal detachment as the only structural distortion. Intact sections of the eyeball obtained compares well with the laborious, expensive, and 8-week long celloidin method. Our method has wider potential usability than costly freeze drying method which requires special skills and equipment (cryotome) and does not produce whole eyeball sections, *Microsc. Res. Tech. 00:000-000, 2013.* @2013WileyPeriodicals, Inc.

University of Ghana Medical Students' Association (UGMSA)

Report of Momic Grand Climax

The Class of 2017 defied all odds to organize what can be described as the best MOMIC event ever on 15th November, 2013 at the forecourt of the Basic Sciences.

The eventful night which was also the climax of all the MOMIC 2013 activities saw performances and mimicking of lecturers from students of both MB2 and MB3 as well as MEGA and MRT from both classes.

The programme was in collaboration with the Class of 2018 and Ghana Health Service. Dignitaries who attended the programmed included the Acting Dean of UGMS; Prof. Jennifer Welbeck, Prof. Bamenla Goka, the matron of NICU, Reps from GHS and our beloved lecturers.

COMMUNITY OUTREACH

The MOMIC team organized a Community Outreach for the women and teenagers in Korle-Gorno on Wednesday, 18th September, 2013 at Mount Zion Methodist Church forecourt, Korle-Gorno township. The programme was well attended by nursing mothers, teenagers and other members of the Community as they were educated on issues such as breastfeeding, healthy lifestyles, safe birth methods and the importance of pre-natal, antenatal and post-natal care. The programme was organized under supervision of the Department of Child Health, KBTH and a Community Health nurse, KBTH.

DONATION TO NEONATAL INTENSIVE CARE UNIT (NICU)

The MOMIC team of the Class of 2017 made a donation worth GHC 5,000 to NICU as part of their bid to support the delivery of quality health care to neonates and children. The items donated included a 17kg capacity washer-drier, syringe pumps and connectors and Pauline items.

HEALTH SCREENING EXERCISE

The venue for this activity was at the Accra Shopping Mall on Saturday 26th October, 2013. People from all walks of life were screened for blood pressure, blood sugar levels, cholesterol levels, malaria and Body Mass Index (BMI). This programme was under the auspices of the Regional Health Services Directorate, Greater Accra Region(GAR).

PROF. ADDAI CUP

Prof.F. K. Addai Cup was introduced by the MOMIC 2013 team in honor of their patron, Prof. F. K. Addai, Head of Anatomy Department – UGMS. The maiden edition took place on 14th September, 2013 on Legon campus and it included soccer competition, basketball and other fun games which were played between the Class of 2017 and the Class of 2018. The trophy was won by the class of 2017 on penalties while the basket ball section was triumphantly annexed by the class of 2018.

List of Approved Protocols from UGMS Senior Members from January to December, 2013

1. Evaluating the effectiveness of the Ghana National Health Insurance Scheme from the service providers' perspective
Dr. Sylvester Yaw Oppong
20tth January, 2013
MS-Et/M.7 - P4.11/2012-13

2. A survey investigating the prevalence of Hepatitis C virus infection in patients attending Korle-Bu Teaching in Accra, Ghana
Dr. Adwoa Afrakoma Agyei
28th January, 2013
MS-Et/M.6 - P 4.7/2012-13

3. Factors associated with waiting time for breast cancer treatment in Korle-Bu Teaching Hospital
Dr. Florence Dedey,
18th February, 2013
MS-Et/M.6 - P 4.6/2012-13

4. Relating unplanned pregnancy to contraceptive use among Ghanaian women attending antenatal and postnatal clinic at KBTH, Accra
Dr. Kwame Adu-Bonsaffoh
18th March, 2013
MS-Et/M.7 - P 4.7/2012-13

5. Evaluation of red blood cells and fibrin fibres in sickle cell haemoglobinopathy by electron microscopy
Prof. Richard Apatu,
26th March, 2013
MS-Et/M.8 - P 4.10/2012-13

6. The relationship between depression and glycaemic control among persons with type 2 diabetes in selected facilities in Ghana and Nigeria
Dr. Josephine Akpalu,
26th March, 2013
MS-Et/M.6 - P 4.4/2012-13

7. Genetic research addressing gene mutations associated with kidney disease as part of Human
Dr. Dwomoa Adu,
4th April, 2013
MS-Et/M.3 - P 4.2/2012-13

8. Late presentation of determinants of breast cancer in patients
Dr. Ralph Armah,
17" April, 2013
MS-Et/M.9 - P 3.3/2012-13

9. Hepatitis B viral resistance to Lamivudine (3TC) therapy in Hepatitis B (HBV) HIV co-infected Ghanaian patients.
Dr. T.N.A Archampong
18th April, 2013
MS-Et/M.3 - P 5,10/2011-12

10. Bacterial variation and E. Coli Clones in inflammatory bowel disease,
Dr. T. N.A Archampong
18th April, 2013
MS-Et/M.7 - P 3,1/2012-13

11. Evaluation of the management of acute hyperglycemia in diabetics admitted in a poorly resourced urban primary care centre in Ghana
Dr. Henry Lawson,
26th April, 2013
MS-Et/M.8 - P 3.1/2012-13

12. Person related information (PERI) - What influences our decisions in general practice
Dr, Henry Lawson
30th April, 2013
MS-Et/M.9 - P 5.10/2012-13

13. Nucleoside reverse transcriptase inhibitors (NRTI) Use and frequency of HIV Peripheral Neuropathy (HIV-PN) in Accra, Ghana
Dr. Peter Puplampu
21st May, 2013
MS-Et/M.9 - P 5.7/2012-13

14. Clinical, Demographic and Genetic risk factors of Nevirapine hypersensitivity reaction among HIV infected patients at KBTH, Accra
Dr. William Kudzi
22nd May, 2013
MS-Et/M.8 - P 4.2/2012-13

15. Determining risk factors for central nervous system events in Ghanaian Children with sickle cell disease: A pilot study
Dr. Yvonne Dei Adomakoh
6th June, 2013
MS-Et/M.8 - P 4.2/2012-13

16. Factors associated with non-compliance with medications among hypertensives in Ghana and Nigeria
Dr. Vincent Boima
12th August, 2013
MS-Et/M.5 - P 4.6/2012-13

17. A phase 3, double-blind, randomized, efficacy and safety comparison of prasugrel and placebo in pediatric patients with sickle cell disease
Dr. Catherine Segbefia
19th September, 2013
MS-Et/M.1- P 3.8/2013-14

18. Role of Microrna's in malaria and sickle cell disease severity
Prof. Richard Gyasi
30th October, 2013
MS-Et/M.3 - P 4.7/2013-14

19. Ghana prostate cancer cohort
Prof. Edward Yeboah
1st November, 2013
MS-Et/M.2 - P 4.7/2013-14

- *Total number of protocols reviewed by Ethical and Protocol Review Committee (EPRC) = 66*
- *Protocol from UGMS Senior Members = 19*

Junior & Senior Staff News
Promotions, 2013

	NAMES	FROM	TO
1.	Addai Danquah Samuel	Security	Grade 1 Snr. Campus Gd.
2	Mohammed Bahor Hamidu	Security	Grade 1 Snr. Campus Gd
3.	Haruna Rafik	Admin. Assistant	Snr. Admin. Assistant
4.	Umar Said Alhassan	Admin. Assistant	Snr. Admin. Assistant
5.	Mantey Vera	Domestic Bursar	Snr. Domestic Bursar
6.	Danso Gilbert Odoi	Snr. Steward	Domestic Bursar
7.	Quaye A. Florence	Cook	Snr. Cook
8.	Nyamebe Catherine	Accts. Clerk I	ICT Clerk
9.	Aboagye Margaret	Library Assistant	Snr. Library Assistant
10.	Alex N. T. Crabbe	Snr. Accts. Assistant	Principal Accts. Assistant
11.	Otoo O. Ransford	Accts. Assistant	Snr. Accts Assistant
12.	Ballu Ibrahim Salifu	Assistant Porter	Assistant Head Porter
13.	Abdul Rahman Adamu	Assistant Porter	Assistant Head Porter
14.	Abdul Malik Sulley	Snr. Research Assistant	Princ. Res. Assistant
15.	Mohammed Razak	Procurement Assistant	Snr. Procurement Assistant
16.	Isaiah Agbovie	Procurement Assistant	Snr. Procurement Assistant
17.	Dorothy Atta-Fynn	Snr. Admin. Assistant	Principal Admin. Assistant
18.	Nana A. K. Dsane	Snr. Admin. Assistant	Principal Admin. Assistant
19.	Elfreda O Ashitey	Snr. Admin. Assistant	Principal Admin. Assistant
20.	Faustina Yirenkyi	Snr. Admin. Assistant	Principal Admin. Assistant