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EDITORIAL**ORO-FACIAL MALIGNANT TUMOURS IN CHILDREN**

The mention of the words cancer or malignant lesion evokes a feeling of trepidation in the average Ghanaian. There has been quite a number of public education programmes on the incidence and management of cancers of the breast, cervix, lung, and skin in the Ghanaian media such that awareness has increased tremendously. It is not rare to see several women flocking to have free breast and cervical screening carried out whenever these services are provided by private and public organizations. The average Ghanaian also has the perception that cancers are predominantly an adult problem hence little is known about the incidence of oro-facial malignant lesions involving children and young adults.

Oro-facial swellings involving children and the young adult population could be generally grouped into odontogenic infections, cysts and tumours (benign/malignant). The malignant lesions may include cancers, lymphomas, and sarcomas. Brown & Wright, 1967 reported Burkitt's lymphoma (BL) as the most common malignancy of childhood. Oguonu et. Al. examined the epidemiology of BL in Enugu, Nigeria and observed that 86% of their patients were from rural areas. Also 75 % were from lower socioeconomic class. They further reported a higher incidence of BL during the drier seasons and the period of high malaria transmission ($p < 0.05$).

Burkitt's lymphoma (BL) is an aggressive B-cell form of Non-Hodgkin's Lymphoma frequently seen in children and young adults. Out of the three main types of Burkitt's lymphomas known, the endemic type

which is associated with the Epstein-Barr virus (EBV) is mostly found in Africa. This may affect the jaws, kidneys, spleen, liver, bone marrow and other organs. The abdomen was the commonest site of tumor presentation (46%), while the jaw was the second commonest tumor site (31%). A significant association was observed between girls and abdominal tumors ($p < 0.05$).

The Burkitt's lymphoma patient may exhibit signs of fever, malaise and sweating and if the jaw bones are involved could present as an acute swelling which may be misdiagnosed as an acute infection of dental origin. As a result cases of BL affecting the jaw may be referred to the dental surgeon without prior general body examination to exclude other organ involvement. Infant patients with jaw lesions find it difficult or refuse to eat due to the severe pain on mastication and also resist attempts at carrying out any thorough intraoral examination. Detailed examination, radiographs and aspiration biopsy are essential aids to eliminating dental abscess as the diagnosis.

Nkrumah and Perkins (2006) observed that cyclophosphamide induced complete clinical remission in over 75% of the patients irrespective of stage of the disease. Long-term sustained remissions, however, were mostly obtained in patients with localized disease (stage I-II).

Delayed diagnosis and abandonment of therapy by patients may seriously influence the treatment outcome.

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ORIGINAL ARTICLES

CHILDHOOD ORAL AND MAXILLOFACIAL CANCER AT THE KORLE-BU TEACHING HOSPITAL, ACCRA, GHANA

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Abstract

Background: There is limited information on the incidence and distribution of childhood malignant oral and maxillofacial tumours. The aim of this study was to carry out a retrospective evaluation of the prevalence and distribution of oral and maxillofacial cancers seen in children at Korle-Bu Teaching Hospital (KBTH), a tertiary hospital.

Patients and method: The selection criteria was all patients who were seen at the department 15 years old and younger with an orofacial tumour (benign and malignant), between January 1998 and December 2007. The clinical and histopathological charts of all these patients were retrieved from the records office of the Oral and Maxillofacial Surgery (OMFS) Department of KBTH. There was no difficulty retrieving the charts. Their age, sex, location of tumour, signs and presenting symptoms and histopathological report were recorded and transferred

to a Microsoft Excel* spread sheet and analysed.

Results: 118 charts of the patients met the selection criteria. 34 (28.8%) of them were records of patients whose lesions were reported as malignant neoplasms. The mean age was 9.4 years. The male: female ratio was 1:1. Histologically, 73.5% (N=25) of the lesions were diagnosed as lymphoma. 50% (N=17) were Burkitt's lymphoma (BL). 20.6% (N=7) were rhabdomyosarcoma (RBD). There was one each of osteogenic sarcoma (OSC) and squamous cell carcinoma (SCC).

29 (85.3%) of the children underwent chemotherapy, three children with RBD were treated by surgery and adjuvant radiotherapy.

Conclusion: BL is the most common malignant maxillofacial cancer found in Ghanaian children and chemotherapy is the commonest mode of treatment.

Key Words: Childhood, malignant, tumours, orofacial, Ghana

INTRODUCTION

Childhood malignant oral and maxillofacial tumours in developing countries have scantily been reported on¹. Data on the subject from Africa has concentrated on a few countries^{2,3,4,5}. Reports from USA suggest that the prevalence may be rising^{6, 7} however because reporting from different studies sometimes uses different maximum ages, comparing them can be difficult^{8,9,10}. Public health management of these potentially fatal pathologies require very good and reliable data with continuous and consistent updating¹¹⁻¹³. There seems to be a variation in the reported prevalence from studies carried out on different continents as well as differences in prevalent tumour types. Sato et al.¹⁴, Chen et al.¹⁵ and Tanaka et

al.⁸ reported that incidence in Asian populations ranged from 2.9-7.3%, while according to Arotiba et al.², Kalyanyama et al.⁵ and Aregbesola et al.¹⁰, the incidence ranged from 40% to 51% in African patients. Studies by Jones et al.¹⁶ and Ulmansky et al.¹⁷, all suggest much lower prevalence in Caucasians. According to Das et al.¹⁸ and Shah et al.¹⁹, malignant neoplasms represented 1.2% and 0.8% respectively of total tumours found in the North American populations studied. There are very few specific reports on malignant neoplasms of the jaws alone in children and most of them refer to a particular type of tumour^{20, 21-25}.

The high incidence of BL in locations where most of the African studies have been carried out has sometimes been suggested as the main reason for the high prevalence, however in a more recent study from Ghana²⁶ it was noted that if this was excluded from the data, the prevalence is reduced but remains high.

The causes of childhood orofacial cancers including BL and other cancers are still being researched²⁷. Using different statistical measuring methods may contribute to the variation in reported data^{18, 19, 20, 26}. The aim of this study was to conduct a retrospective analysis of the prevalence of malignant tumours seen in children aged 15 years or below

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attending a tertiary care hospital in Accra, Ghana. There is limited information on the subject.

Continuous evaluation of these pathologies would help in following the trend and also provide information for medium and long term development of management strategies.

Patients and Method

The selection criteria were records of patients who were 15 years or younger with orofacial tumours. Clinical and histopathological charts of all who met this criteria, who attended the OMFS Department of KBTH, Accra, between January 1998 and December 2007 were retrieved from the records office with no difficulty. The charts of patients whose tumour had been confirmed after a biopsy as malignant were further studied. Their age, sex, signs and symptoms, site of lesion, histology and mode of treatment were recorded using a data collection sheet. The data was transferred to a Microsoft Excel* spreadsheet and analysed.

Results

There were a hundred and eighteen charts (118) that met the study criteria of patients who were 15 years or younger with an orofacial tumour (both benign and malignant). Out of this, thirty-four (28.8%) were charts of patients with malignant neoplasm. The charts of this group were further evaluated. There was an equal gender distribution with male to female ratio of 1:1. The age distribution is shown in Figure 1. The youngest was 3 years old and the oldest 15. The average age of the boys was 8.4 years, girls 10.4 years and the whole group, 9.4 years. The prevalence of the pathologies is shown in Table 1. 12 boys and 13 girls had lymphoma. The average age of patients with this pathology was 8.84. All the lymphomas were extranodal non-Hodgkin's lymphoma (NHL). BL had the highest incidence (N=17) with a male to female ratio of 9:8. The patients with NHL were on average older than the patients with the other tumours (Table 2). Two of the tumours occurred once – Osteosarcoma (OSC) and Squamous Cell Carcinoma (SCC). Both were boys and aged 15 years. The gender distribution of the patients with Rhabdomyosarcoma (RBD) was 3:4 (M:F). 91% (N=31) presented with a painless swelling of the orofacial region. The commonest site was the maxilla with 31 tumours (91%). One was bi-maxillary in location and the other two in the mandible. There were other symptoms that were sometimes associated with the swelling. These included mobile teeth (15%), toothache (10%), mouth ulcer (9%) and dysphonia (5%). The other three patients with no jaw swelling had as their primary symptom- gum swelling, large mouth ulcer and a dental abscess.

Twenty-nine (85.3%) of the children underwent chemotherapy, three children with RBD were treated by surgery and adjuvant radiotherapy.

The child with SCC was treated by chemotherapy and radiotherapy and the one with OSC was given palliative treatment. The survival rate for these patients was not studied, however the patients with RBD, OSC and SCC survived for short periods and died within two years with complication of metastasis to the lungs.

Discussion

The reported incidence of the different malignant neoplasms in children in the orofacial region varies between studies on different continents^{2, 3, 4,5,10,16,17,18}. In studies carried out in African societies the incidence of NHL is higher than other malignancies^{2,5,10}. BL which is endemic in these locations makes a huge contribution to this high incidence. There can also be a wide variation in the incidence even when the studies are from the same population¹. The explanation for these variations still remains a subject for research. Racial differences, geography and ethnicity have all been suggested as possible aetiological factors^{1, 25, 27}.

The prevalence of orofacial malignant tumours from this study is 28.8% (34 out of 118). This is higher than a recent study from Ghana (22.3%)²⁶, and a study from Nigeria (13.3%)¹ and contrasts with reports by Arotiba² and Aregbesola et al.¹⁰ who reported a prevalence of 40.2% and 51%, respectively also from Nigeria.

In the first decade of life the prevalence of malignant tumours among the boys was higher (Figure 1) (M: F=13:7) but this was reversed in the older age group (10-15 years) with boys to girls ratio of 4:10. In most studies the incidence of malignant tumours is higher among the boys though with significant variation^{1, 10, 26}. Studies from South America suggest an even distribution of malignant neoplasms among male and female²⁵.

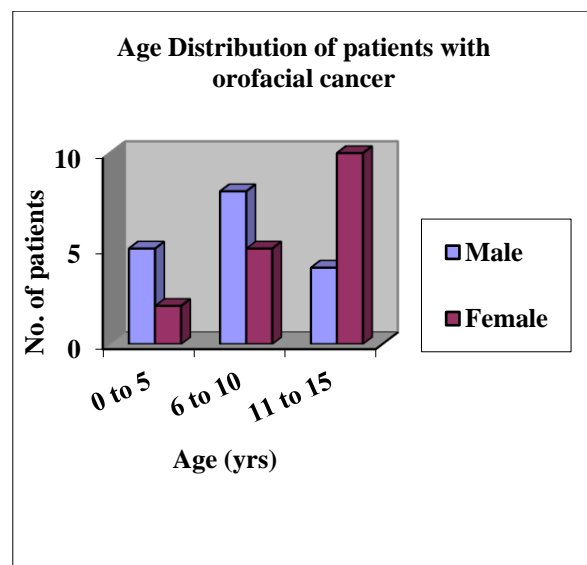


Fig. 1: Age Distribution of patients with orofacial cancer

The tumour with the highest prevalence was lymphoma (N=25) followed by sarcoma then carcinoma (Table 1 and also Figure 1).

Table 1: Incidence of malignant orofacial tumours

Tumour	Incidence	% Incidence
Lymphoma	25	73.5
Sarcoma	8	23.5
Carcinoma	1	2.9
Total	34	100

This is consistent with multiple studies carried out round the globe^{1, 2, 14, 10, 17, 28, 29}. The gender distribution was nearly even with respect to lymphomas (12:13 or 0.9) and equal in the sarcoma group (Figure 2). Only one 15 year old boy had carcinoma. The slightly higher prevalence of lymphomas among the girls is in contrast with the findings of most other studies where the prevalence among boys is higher than girls in all groups of malignant tumours of the orofacial region.^{1, 10, 25}

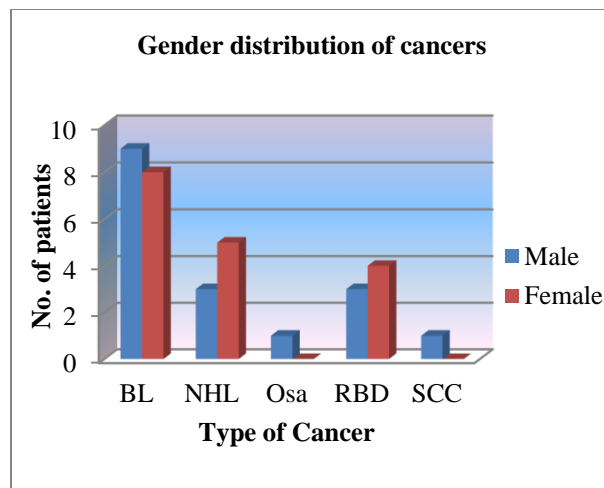


Fig. 2: Gender distribution of cancers

The average age for the group with lymphomas is 8.84 which is similar to other studies in Ghana and Nigeria^{1, 30, 31, 32}. However the girls were on average older than the boys and the prevalence slightly higher among them (Figure 2 and Table 2). The mean age in the South American study suggests an average age of 7.9 and male female ratio of 1:3²⁵.

Table 2: Average age of patients in different tumour groups

Sex	BL	NHL	RBD	OS	SCC
Boys	7.22	8.67	7.33	15	15
Girls	7.75	13.6	11.5	NIL	NIL
Both sexes	7.47	11.75	9.7		

In this study BL (Figures 3a, 3b, 3c) consists of 50% (N=17) of the total number of malignant tumours and 68% of the lymphomas. Excluding BL, the incidence of lymphomas drops from 73.5% to 47.1% (8 cases of lymphoma out of 17 malignant tumours) and the incidence of malignant tumours of the orofacial region from 28.8% to 16.8%. The male: female ratio is 9:8 (1:1). This ratio does not support the very high prevalence seen in boys in most studies^{1, 10} though it confirms the higher incidence in boys. Segbefia et al report 72% BL of all childhood lymphomas seen at the KBTH³³.



Fig. 3a: 7year old boy with Burkitt's lymphoma of left maxilla



Fig. 3b: Intraoral lesion of patient in Figure 3a



Fig. 3c: Same patient after 2 cycles of chemotherapy

There were eight (8) sarcomas of which one was OSC and the rest were RBD (Figures 4a, b). The former represents 2.9% of the malignant tumours and the latter 20.6%. They are usually reported to occur in the younger age group. In this study the youngest was 5 and oldest 13 for the RBD group. There were more girls (N=4) with the condition than boys (N=3). The girls were, as the other groups, older than the boys (Table 2). The only patient with OSC was a 15 year old boy.



Fig. 4a: 9 year old girl with Rhabdomyosarcoma of left maxilla



Fig. 4b: Patient in fig. 4a after surgery and chemotherapy

The variety of malignant neoplasms was very restricted in this study. This may be that some of the tumours are very rare. Ajayi¹ attributes the low incidence to the low global incidence of childhood malignant tumours. Another factor could be the use of local medicine men in our region who may be the first port of call for the parents and hence the child not being brought to the hospital in time before their demise.

Carcinoma is consistently the rarest of all the tumours in this age group with only one recorded in this study. This is similar to most other studies^{10, 17, 34}. It is infrequent in patients under 20 years of age and extremely rare in the first decade of life^{1, 4}. The risk factors of squamous cell carcinomas in adolescents

have been widely discussed²⁵. The main risk factors of tobacco and alcohol and the period of indulgence are usually very low because of the period of contact. Other factors such as genetic predisposition, viral infections and states of immunodeficiency, among others may still have a role to play³⁵.

The treatment methods are limited in our region, especially due to late presentation. Chemotherapy remains the main mode of treatment with unpredictable results. Surgery is aimed at debulking and palliation. The survival rate for these patients was not studied as already mentioned, however most of the patients did not return for review, as parents visit traditional medicine men with their wards with the hope that there would be better outcome. The patients who presented early had better outcome, such as the one shown in figures 3a, 3b and 3c.

Conclusion

The commonest childhood malignant tumour in this study was lymphoma with sarcoma a distant second and only one carcinoma. BL is the commonest of the lymphomas. The gender variation is not as wide as reported in other studies being equal in the overall prevalence. The prevalence was higher among the girls in the oldest age group. Chemotherapy is the mainstay of treatment with variable results.

There is the need to educate the public on early presentation since that would give a good outcome. There is also the need for a prospective study to establish incidences over more prolonged periods. Conclusions made using higher incidences may be more substantive.

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SURGICAL ONCOLOGICAL MORTALITIES: A FIFTEEN YEAR ANALYSIS IN KORLE BU TEACHING HOSPITAL, GHANA

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Abstract

Introduction: Cancer is the leading cause of death in economically developed countries and second leading cause of death in developing countries. Despite the high cancer mortality rates in developing countries the contribution of cancer to death in surgical practice has not been determined in our institution. An analysis of cancer deaths in the department of surgery at the Korle Bu Teaching Hospital is presented.

Methods: All cases of cancer deaths from 1st January 1998 to 31st December 2013 were retrieved and retrospectively reviewed. The sex, age, primary tumour site, period of admission prior to death, cause of death and post-mortem findings formed the primary data for the analysis.

Results: There were 113,960 admissions in the surgical department of KBTH over the fifteen year

period, with 4,979 overall deaths, of which 1,637 were cancer mortalities, representing 32.85% of the total mortality and a cancer mortality rate of 1.44%. The commonest cancer deaths were from breast (14.48%), prostate (12.52%), colorectal (9.65%), gastric (8.74%) and pancreas (8.67%). Brain tumours and Wilm's tumours accounted for 37% and 21% respectively of cancer mortalities in the paediatric age group. Cancer mortalities in the adolescent age group showed many cases of nasopharyngeal cancers (15.85%). Lung cancers accounted for only 1.16% of cancer mortalities in the institution.

Conclusion: Cancer accounted for a third of the deaths in the surgical department of KBTH with breast and prostate cancers being the leading overall causes of cancer deaths. Deaths due to lung cancer were low contrasting with the world trend.

Key Words: Solid tumours, deaths, breast, prostate, gastrum, Accra

Introduction

Communicable diseases were the main causes of death around the world for several years and life expectancy was low due to repeated waves of epidemics. The development of vaccination, antibiotics and improvement in sanitation, witnessed emergence of non-communicable diseases (NCDs) causing havoc in industrialized countries, a situation that led to initiation of strong public health programmes. These diseases which are associated with economic development include cardiovascular diseases, cancer and diabetes. The scourge of NCDs is currently global, with an increasing trend in developing countries where, the rapid change in disease pattern brings along an additional burden to that of dealing with infective diseases in a poor environment characterized by ill-health systems. Cancer incidence is rising rapidly in many developing nations.

Cancer is the leading cause of death in economically developed countries and the second leading cause of death in developing countries.¹ In 2012 there were 14.1 million new cancer cases, 8.2 million cancer deaths and 32.6 million people living with cancer in the world.² Of these, 57% of the new

cases, 65% of the cancer deaths and 48% of the five year prevalent cancer cases were in the less developed regions of the world.² The cancer burden in health care is estimated to increase over the years and this will challenge developing countries where a disproportionately higher rise in incidence is anticipated.³

The aforementioned notwithstanding, there is a dearth of data on cancer incidence, prevalence and mortality rates in less developed regions as a result of limited finances, lack of resources and lack of political will. The absence of cancer registries has led to estimations of cancer prevalence using combinations of country life tables, cause of deaths models, regional cause of death patterns and WHO and UNAIDS programme estimates for major cancers. Data from institutional reviews, case series, mortality records, hospital based cancer registries and a few population based cancer registries have been very useful in this process.^{4,5}

Surgery is critical in the treatment of solid tumours and many such cases are seen by the surgeon. Up to 80% of cancers seen in hospitals in the developing world are advanced and surgery is normally for palliation.⁶ Cancer mortality rates are therefore high, yet the contribution of cancer to deaths in surgical practice is not determined in our institution.

In this report an analysis of cancer deaths, **defined as deaths with cancer as the underlying cause**, among surgical patients seen at the Korle Bu Teaching Hospital over a fifteen year period is presented, providing the patterns of the cancers and the proportions of mortality due to cancer. Such summary

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data provides useful information for both advocacy and policy for addressing issues concerning cancer care and prevention in the population served.

Materials and Methods

All deaths that occurred in the Department of Surgery, Korle Bu Teaching Hospital (KBTH) over a 15year period, from January 1998 to the end of December 2013, were retrieved from the mortality ledgers and reviewed retrospectively.

All cases of cancer deaths, **in the department of surgery** were entered into a database using excel sheet and later transferred into SPSS version 20 for analysis.

Information collected on each case included, age, sex, date of admission and date of death and hence duration of admission, site of primary tumour, other associated diagnosis on admission, clinical cause of death and post-mortem findings.

The primary tumours were classified according to the anatomical site of the tumour except for histological types such as melanomas, lymphomas and leukaemia. The ages were grouped according to the International Agency for Research on Cancer (IARC) Lyon, France) for cancer reporting namely 0-14, 15-24, 25-34, 35-44, 45-54, 55-64, ≥ 65 .

The cases were analysed according to sex, age distribution for all ages, duration of admission, the primary tumour sites overall and primary tumour site in relation to the sex and age. The annual cancer mortalities over the 15year period were also analysed.

Descriptive statistics were computed including frequencies, means, median, standard deviation and inter-quartile ranges.

Results

There were a total of 113,960 patients admitted in the Surgical Department of Korle Bu Teaching Hospital, between the 1st of January 1998 and the 31st of December 2013 with 4,979 overall deaths during this period of which 1,637 were cancer mortalities representing 32.88% of the total mortality and a cancer mortality rate of 1.44%; Table 1.

688 (42.03%) were female and 947 (57.85%) male cancer deaths giving a male: female cancer death ratio of 1.4:1.

The mean age for females was 52years (SD 18.59) and that of males 55years (SD 19.96). The median age for females was 53years (IQR = 42-66 years) and 58years (IQR = 44-70 years) for males. Ages were not stated for two females and two males. Table 2 summarizes the proportions of cancer deaths occurring in the various developmental milestones of man. Cancer mortalities were low before middle age but almost doubled from middle age onwards.

Mean and median length of hospital stay for all patients who died due to cancer during the period under review were 15days and 10days respectively (IQR = 4-20 days).

Table 1: Yearly or annual proportion of cancer deaths

Year	Total No. of admission	Total No. of all deaths	Total No. of cancer deaths	% Cancer cause of death
1998	1563	43 (2.75%)	11(0.70%)	25.58%
1999	4882	175(3.58%)	78(1.60%)	44.57%
2000	2985	97(3.25%)	20(0.67%)	20.62%
2001	8222	344(4.18%)	121(1.47%)	35.17%
2002	7052	324(4.59%)	112(1.59%)	34.57%
2003	15261	296(1.94%)	91(0.60%)	30.74%
2004	6533	279(4.27%)	91(0.78%)	32.62%
2005	9237	465(5.03%)	108(1.17%)	23.23%
2006	6931	330 (4.76%)	119(1.72%)	36.06%
2007	6148	300 (4.88%)	108(1.76%)	36.00%
2008	9481	490 (5.17%)	154(1.62%)	31.43%
2009	4612	256 (5.55%)	98 (2.12%)	38.28%
2010	11024	486 (4.41%)	143 (1.30%)	29.42%
2011	4747	255 (5.37%)	88 (1.85%)	34.51%
2012	5819	336 (5.77%)	132 (2.27%)	39.29%
2013	9463	503 (5.27%)	163 (1.72%)	32.41%
Total	113960	4979 (4.37%)	1637 (1.44%)	32.88%

Table 2: Age distribution of cancer deaths

Age group	No. of cancer deaths	Mean age
0-14	81	7.7
15-24	82	19.7
25-34	98	30.2
35-44	186	39.7
45-54	302	49.6
55-64	344	59.3
>65	541	73.4
unknown	3	0
Total	1637	

Table 3 summarizes the overall cancer mortalities. The commonest causes of cancer deaths were breast 237 (14.48%), prostate 205 (12.52%), colorectal (colon 96 and rectum 62) 158 (9.65%), gastric 143 (8.74%) and pancreatic cancer 142(8.67%).

In females, malignancies of breast 229 (33.28%) were the most common cause of deaths, followed by pancreas 68 (9.88%), and colorectum (colon40 and rectal28) 68 (9.74%) as depicted in Table 3

Prostate cancer was the most frequent cause of cancer deaths in male, 205 (21.60%), followed by gastric 96 (10.12%), and colorectal cancer (colon 56 and rectal 34) 90(9.48%); Table 3

There were 81 paediatric (<15years old) cancer mortalities, of which 48 were males and 33 were females; male to female ratio of 1.45:1. In the paediatric group, overall, the malignancies with the highest mortality were brain tumours (30) followed by Wilm's tumour (17), accounting for 37.04% and 20.99% respectively. The full details of these cancer deaths are depicted in Table 4.

Table 3: Overall cancer deaths; female: male distribution

Cancer type	No. of deaths- overall (%)	No. of deaths female (%)	No. of deaths males (%)
Breast cancer	237 (14.48%)	229 (33.28%)	8 (0.85%)
Prostate cancer	205 (12.52%)	0 (0)	205 (21.65%)
Colorectal cancer	158 (9.65%)	67 (9.74%)	91 (9.61%)
Gastric cancer	143 (8.74%)	47 (6.83%)	96 (10.14%)
Pancreatic cancer	142 (8.67%)	68 (9.88%)	74 (7.81%)
*Urinary Bladder cancer	102 (6.23%)	24 (3.49%)	77 (8.13%)
Brain cancer	86 (5.25%)	31 (4.51%)	55 (5.81%)
Hepatocellular cancer	68 (4.15%)	16 (2.33%)	52 (5.49%)
Lymphoma	40 (2.44%)	10 (1.45%)	30 (3.17%)
Oesophageal cancer	38 (2.32%)	13 (1.89%)	25 (2.64%)
*Gall bladder cancer	34 (2.08%)	23 (3.34%)	10(1.06%)
Laryngeal cancer	31 (1.89%)	2 (0.29%)	29 (3.06%)
Sarcoma	28 (1.71%)	12 (1.74%)	16(1.69%)
Nasopharyngeal cancer	25 (1.53%)	4 (0.58%)	21 (2.22%)
Unspecified Intra-abdominal tumour	20 (1.22%)	9 (1.31%)	11 (1.16%)
Lung cancer	19 (1.16%)	7 (1.02%)	12(1.27%)
Wilm's tumour	17 (1.04%)	9 (1.31%)	8 (0.84%)
Cervical cancer	16 (0.98%)	16 (2.33%)	0 (0)
Cholangiocarcinoma	15 (0.92%)	8 (1.16%)	7 (0.74%)
Thyroid cancer	15 (0.92%)	8 (1.16%)	7 (0.74%)
Osteosarcomas	14 (0.86%)	4 (0.58%)	10 (1.06%)
Pelvic cancer	13 (0.79%)	7 (1.02%)	6(0.63%)
Renal cancer	13 (0.79%)	3 (0.44%)	10 (1.06%)
Squamous cell cancer	13 (0.79%)	5 (0.73%)	8 (0.84%)
Cancer of the tongue	11 (0.67%)	6 (0.87%)	5 (0.53%)
Retroperitoneal cancer	10 (0.61%)	6 (0.87%)	4 (0.42%)
Malignant melanoma	8 (0.49%)	6 (0.87%)	2 (0.21%)
Ovarian cancer	7 (0.43%)	7 (1.02%)	0 (0)
Anal cancer	8 (0.49%)	2 (0.29%)	6 0.63% ()
Small bowel cancer	7 (0.43%)	4 (0.58%)	3 (0.32%)
Tonsillar cancer	7 (0.43%)	0 (0)	7 (0.74%)
Parotid cancer	6 (0.37%)	3 (0.44%)	3 (0.32%)
Leukemia	5 (0.31%)	2 (0.29%)	3(0.32%)
Testicular cancer	5 (0.31%)	0 (0)	5 (0.53%)
Multiple myeloma	4 (0.24%)	2 (0.29%)	2 (0.21%)
Mediastinal tumor	4 (0.24%)	0 (0)	4 (0.42%)
Neuroblastoma	2 (0.12%)	1 (0.15%)	1(0.11%)
Orbital cancer	4 (0.24%)	1 (0.15%)	3 (0.32%)
Adrenal cancer	4 (0.24%)	3 (0.44%)	1(0.11%)
Endometrial cancer	3 (0.18%)	3 (0.44%)	0 (0)
Mesenteric tumor	3 (0.18%)	2 (0.29%)	1(0.11%)

The cancer mortalities in the adolescent ages (15-24years) showed many cases of nasopharyngeal cancers 13 (15.85%); Table 4. Colorectal (rectal 7; colon 6)

cancers 13(15.85%), followed by lymphomas 7 (8.54%), and osteosarcomas 6 (7.32%) were the next most common cancer deaths. They were made up of 51 males and 31 females giving a ratio of 1.65:1.

Continuation of Table 3

Cancer type	No. of deaths- overall (%)	No. of deaths female (%)	No. of deaths males (%)
Maxilla cancer	3 (0.18%)	1 (0.15%)	2 (0.21%)
Spinal tumor	4 (0.24%)	1 (0.15%)	3 (0.32%)
Neurofibroma	2 (0.12%)	0 (0)	2 (0.21%)
Oropharyngeal cancer	2 (0.12%)	0 (0)	2 (0.21%)
Uterine cancer	2 (0.12%)	1 (0.15%)	1 (0.11%)
Neuroendocrine tumor	2 (0.12%)	2 (0.29%)	0 (0)
Other cancers	32 (1.95%)	13 (1.89%)	19 (2.01%)
Total	1637 (100%)	688 (100%)	947 (100%)

*Gender was not indicated for 2 mortalities; Gall bladder cancer (1) and urinary bladder cancer (1).

Table 4: Distribution of Cancer deaths by developmental age groupings

Cancer type	Overall n (%)	0 - 14yrs n (%)	15 - 24yrs (%)	25 - 44yrs (%)	45 - 64yrs (%)	≥ 65yrs (%)
Breast cancer	237(14.48)	-	4 (4.87)	75 (26.41)	124 (19.20)	34 (6.28)
Prostate cancer	205 (12.52)	-	1 (1.22)	3 (1.06)	56 (8.67)	145 (26.80)
Colorectal cancer	158 (9.65)	1 (1.23)	13 (15.85)	30 (10.56)	51 (7.89)	63 (11.65)
Gastric cancer	143 (8.74)	-	1 (1.22)	19 (6.69)	77 (11.92)	46 (8.50)
Pancreatic cancer	142 (8.67)	-	1 (1.22)	12 (4.23)	60 (9.29)	69 (12.75)
Urinary Bladder cancer	102 (6.23)	2 (2.47)	2 (2.44)	25 (8.80)	47 (7.28)	26 (4.81)
*Brain cancer	86 (5.25)	30 (37.04)	5 (6.10)	18 (6.34)	24 (3.72)	8 (1.48)
Hepatocellular cancer	68 (4.15)	3 (3.70)	4 (4.87)	24 (8.45)	25 (3.87)	12 (2.22)
*Lymphoma	40 (2.44)	5 (6.17)	9 (10.98)	12 (4.23)	10 (1.55)	3 (0.55)
Oesophageal cancer	38 (2.32)	-	-	1 (0.35)	23 (3.56)	14 (2.59)
Gall bladder cancer	34 (2.08)	-	-	1 (0.35)	15 (2.32)	18 (3.33)
Laryngeal cancer	31 (1.89)	1 (1.23)	-	4 (1.41)	14 (2.17)	12 (2.22)
Sarcoma	28 (1.71)	6 (7.41)	3 (3.66)	6 (2.11)	7 (1.08)	6 (1.11)
Nasopharyngeal cancer	25 (1.53)	-	13 (15.85)	4 (1.41)	5 (0.77)	3 (0.55)
Unspecified Intr Abd tumor	20 (1.22)	2 (2.47)	2 (2.44)	3 (1.06)	7 (1.08)	6 (1.11)
Lung cancer	19 (1.16)	-	1 (1.22)	5 (1.76)	7 (1.08)	6 (1.11)
Wilm's tumor	17 (1.04)	17 (20.99)	-	-	-	-
Cervical cancer	16 (0.98)	-	-	-	8 (1.24)	8 (1.48)
Cholangiocarcinoma	15 (0.92)	1 (1.23)	-	2 (0.70)	6 (0.93)	6 (1.11)
Thyroid cancer	15 (0.92)	-	-	1 (0.35)	6 (0.93)	8 (1.48)
Osteosarcoma	14 (0.86)	1 (1.23)	6 (7.32)	3 (1.06)	2 (0.31)	2 (0.37)
Pelvic cancer	13 (0.79)	-	1 (1.22)	2 (0.70)	5 (0.77)	5 (0.92)
Renal cancer	13 (0.79)	2 (2.47)	2 (2.44)	4 (1.41)	2 (0.31)	3 (0.55)
Squamous cell cancer	13 (0.79)	-	-	5 (1.76)	7 (1.08)	1 (0.18)
Cancer of the tongue	11 (0.67)	-	1 (1.22)	1 (0.35)	6 (0.93)	3 (0.55)
Retroperitoneal cancer	10 (0.61)	1 (1.23)	1 (1.22)	2 (0.70)	3 (0.46)	3 (0.55)
Malignant melanoma	8 (0.49)	-	-	-	5 (0.77)	3 (0.55)
Ovarian cancer	7 (0.43)	1 (1.23)	1 (1.22)	1 (0.35)	3 (0.46)	1 (0.18)
Anal cancer	8 (0.49)	-	-	1 (0.35)	5 (0.77)	2 (0.37)
Small bowel cancer	7 (0.43)	-	-	1 (0.35)	3 (0.46)	3 (0.55)
Tonsillar cancer	7 (0.43)	-	-	-	4 (0.62)	3 (0.55)
Parotid cancer	6 (0.37)	-	-	1 (0.35)	4 (0.62)	1 (0.18)
Leukemia	5 (0.31)	1 (1.23)	2 (2.44)	-	1 (0.15)	1 (0.18)
Testicular cancer	5 (0.31)	-	3 (3.66)	1 (0.35)	-	1 (0.18)

Continuation of Table 4

Cancer type	Overall n (%)	0 - 14yrs n (%)	15 – 24yrs (%)	25 – 44yrs (%)	45 – 64yrs (%)	≥ 65yrs (%)
Multiple myeloma	4 (0.24)	-	-	1 (0.35)	2 (0.31)	1 (0.18)
Mediastinal tumor	4 (0.24)	-	-	3 (1.06)	-	1 (0.18)
Neuroblastoma	2 (0.12)	1 (1.23)	-	-	-	1 (0.18)
Orbital cancer	4 (0.24)	1 (1.23)	-	1 (0.35)	1 (0.15)	1 (0.18)
Adrenal cancer	4 (0.24)	-	-	3 (1.06)	1 (0.15)	-
Endometrial cancer	3 (0.18)	-	-	-	1 (0.15)	2 (0.37)
Mesenteric tumor	3 (0.18)	-	2 (2.44)	-	-	1 (0.18)
Maxilla cancer	3 (0.18)	-	-	-	3 (0.46)	-
*Spinal tumor	4 (0.24)	-	1	1 (0.35)	1 (0.15)	-
Neurofibroma	2 (0.12)	-	1 (1.22)	-	-	1 (0.18)
Oropharyngeal cancer	2 (0.12)	-	-	-	2 (0.31)	-
Uterine cancer	2 (0.12)	-	-	1 (0.35)	-	1 (0.18)
Neuroendocrine Tumor	2 (0.12)	-	-	-	-	2 (0.37)
Other cancers	32 (1.95)	5 (6.17)	2 (2.44)	7 (2.46)	13 (2.01)	5 (0.92)
Total	1637 (100)	81 (100)	82	284	646	541

*Age not stated for 3 mortalities with brain tumours (1), lymphomas (1) and spinal tumours (1)

The cancer mortalities in the adolescent ages (15-24years) showed many cases of nasopharyngeal cancers 13 (15.85%); Table 4. Colorectal (rectal 7; colon 6) cancers 13(15.85%), followed by lymphomas 7 (8.54%), and osteosarcomas 6 (7.32%) were the next most common cancer deaths. They were made up of 51 males and 31 females giving a ratio of 1.65:1.

Table 4 also shows the cancer mortalities in young adults (25-44 years) in whom 284 cancer mortalities were recorded. Of this, there were 148 males and 136 females, ratio of 1.1:1. These mortalities were mainly 75 (26.32%) cases of breast cancer, 30 (10.53%) colorectal cancers, 25 (8.80%) urinary bladder cancers, 24 (8.45%) hepatocellular cancers, 19 (6.69%) gastric cancers, 18 (6.34%) brain tumors and 12 (4.23%) cases each of pancreatic cancers and lymphoma.

There were 646 mortalities in the middle age group (45-64years) involving 352 males and 294 females; sex ratio of 1.2:1. Table 4 indicates that breast cancer was the predominant cancer in this group accounting for 124 (19.20%) of the mortalities; gastric cancers were 77 (11.92%), pancreatic 60 (9.29%), prostate 56 (8.67%), colorectal (colon 29; rectum 22) 51 (7.89%) and 46 (7.12%) urinary bladder cancers.

In the elderly, 65years and older, 541 cancer mortalities occurred in 347 males and 194 females. In this predominantly male age group (M: F ratio 1.8: 1) prostate cancer was the leading cause of death accounting for 145 (26.80%) cancer mortalities followed by pancreatic 69 (12.75%), colorectal (colon - 45; rectal - 18) 63 (11.65%), gastric 46(8.50%) and 6.28% (34) breast cancers as detailed in Table 4

Cancer mortalities were highest in the seventh decade 338 (20.65%) followed by the sixth 329 (20.10%) and eighth 279 (17.04%) decades. Cancer mortality was

Table 5: Secondary diagnosis

Secondary diagnosis	Number of deaths	%
None	1005	61.39%
Severe anaemia	129	7.88%
Obstructive jaundice	94	5.74%
Intestinal obstruction	68	4.15%
Sepsis	37	2.26%
Respiratory failure	29	1.77%
Chronic renal failure	29	1.77%
Hypertension	23	1.41%
Diabetes mellitus	17	1.04%
Upper gastrointestinal bleeding	16	0.98%
Obstructive uropathy	15	0.92%
Lower gastrointestinal bleeding	14	0.86%
Obstructive hydrocephalus	13	0.79%
DVT	13	0.79%
Gastric outlet obstruction	11	0.67%
Haematuria	11	0.67%
Pulmonary metastasis	10	0.61%
Heart failure	10	0.61%
Urosepsis	10	0.61%
Pathological fracture	8	0.49%
HIV Infection	8	0.49%
Hemoperitoneum	8	0.49%
Pulmonary embolism	7	0.43%
Liver failure	6	0.37%
Anastomotic leakage	6	0.37%
Paraplegia	5	0.31%
Cerebrovascular accident	5	0.31%
Dysphagia	5	0.31%
Malnutrition	5	0.31%
Enterocutaneous fistula	4	0.24%
others	24	1.47%

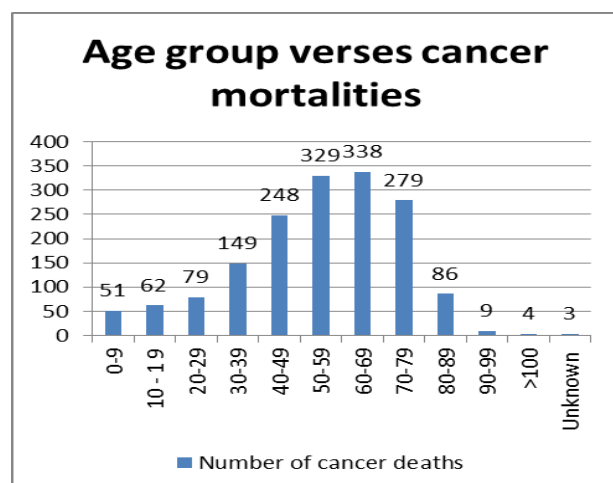


Fig 1: Age group versus cancer mortalities
Vertical (value) axis – number of cancer deaths
Horizontal (category) axis – age groupings

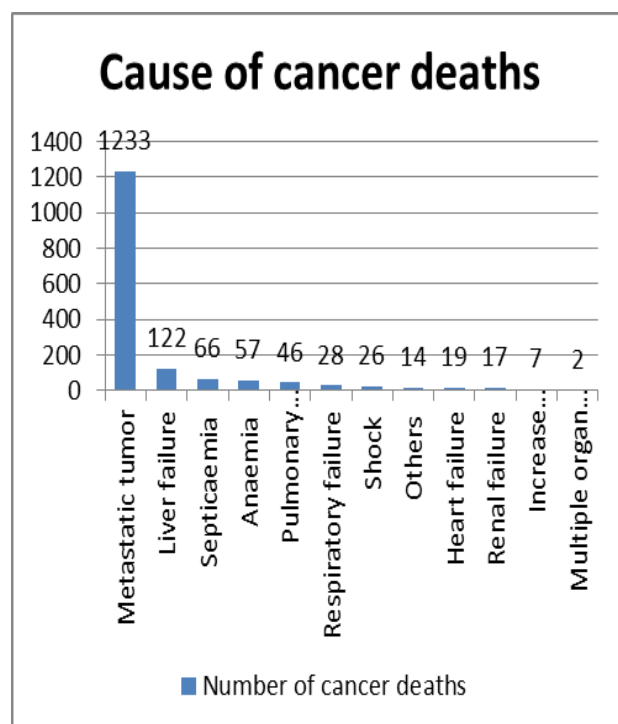


Fig 2: Causes of death
Vertical (value) axis – number of cancer death
Horizontal (category) axis – conditions that cause death

Discussion

Whereas cancer incidence varies greatly all over the world from region to region with up to tenfold difference in some cancers there is less regional variability in its mortality². Any such deference is attributable to differences in availability of resources for treatment and the healthcare seeking behaviour of the population since cancer, when left unattended is invariably fatal.

Out of a total of 113,960 admissions there were 4,979 (4.4%) mortalities in the fifteen year period of which there were 1,637 (1.44%) cancer mortalities. The annual rates of cancer deaths remained fairly constant, fluctuating between 0.6% – 2.27% cancer mortality and 20.62% - 44.57% cancer cause of deaths, with a mean of 32.88%; Table 1. This makes cancer the leading cause of deaths over the infective septic surgical conditions: typhoid perforation, diabetic infections, peptic ulcer perforation, burns and traumatic injuries, which are still significant contributors to deaths in our practice. There is a comprehensive cancer care system at the Korle-Bu Teaching Hospital with multi-disciplinary cancer teams established. The activities of these teams have improved the quality of cancer care but not reduced cancer deaths because these teams are still young, patients present with advanced cancer and are unable to pay for treatment, which is very expensive and paid for out of pocket in our institution. With the exception of only two cancers (breast and cervical) whose treatment are **partially** covered by the national health insurance scheme, no other cancer is.

The cancer cause of deaths was as low as 3.12% in the first decade of life, rose to 20.65% in the 7th decade but declined thereafter to 0.55% in the tenth (0.24% in the eleventh) decades of life. Cancer incidence is lowest in childhood explaining the low rate, but cancer was a major killer in adults of middle age, 50-79, accounting for over half (57.79%) of the cancer mortalities. The incidence of cancer declines after the 8th decade of life but cancer mortality still remains high at this age.⁶ This observation noted in the Western world was not reflected in this study where the mortality due to cancer was lowest after age 80 years. This is as a result of the younger demographic profile of the Ghanaian population, with a small elderly population (≥ 65 years) of 4.7% in the country and 3.6% in Accra.^{7,8}

The finding of 42.03% (688) female and 57.97% (949) male cancer mortalities in this study is in keeping with the almost 25% higher worldwide cancer mortality in men over women.² This proportion is also similar to that reported earlier from the pathology department of the same hospital which showed that out of a total of 3659 cancer mortalities in the hospital 2008 (54.9%) were males and 1651 (45.1%) females.⁹

The most frequent cancers people died from were breast 14.48% (237), prostate 9.94% (205) and colorectal 9.65% (158). Infections causing cancer are still rampant in Ghana, the prevalence of smoking in Ghana is low (3.8% current smoking and 9.7% ever smoked) in people aged 14 years and older and obesity is found in 35% of Ghanaian women.^{10,11} Ghana is transiting into a middle income country and witnessing a rapid increase in urbanization. Urbanization and socioeconomic transformation come with increased access to energy-dense foods and less physical activity and many people will have a positive energy balance

thereby becoming overweight/ obese. These factors are the drivers of cancer and are expected to increase in prevalence over time. An anticipated disproportionate rise in the urban poor population in whom these factors will operate heavily also means that the poor are also more likely to develop and die of cancer due to inability to afford treatment. Strong advocacy to have cancer treatment absorbed by the national health insurance scheme in the country is necessary and urgent.

In females, malignancies of breast were the most common cause of cancer death (33.28%). It was also the commonest cause of cancer deaths from age 25 through to 65 years. In the male population the highest cause of cancer mortality was the prostate 21.60% (205) but this took prominence after 65 years. Breast cancer in women and prostate cancer in men are the most frequent cancers diagnosed in Accra⁹ and are both hormone dependent and their incidence influenced by age. With the progressive modest gain in life expectancy among Ghanaians, these cancers will continue to gain prominence. They both have a high cure rate when diagnosed in their early stage and treated effectively. Though not formally operational there is a policy to guide screening for these two cancers in Ghana and people are encouraged to avail themselves for screening when they attain the prescribed age to start screening.

Cancer of the gastro-intestinal tract, stomach and colorectum are next after breast and prostate in causing deaths. Bowel screening has been shown to reduce the risk of dying from bowel cancer by a quarter in people who are screened.¹² Korle-Bu Teaching Hospital runs an open access gastrointestinal endoscopy service. Besides this there are three other similar services provided by parastatal health institutions in the Accra metropolis. Unfortunately screening asymptomatic people for cancer is not practiced and screening of the gastrointestinal track in patients presenting at the endoscopy suit has been opportunistic.

Lung cancer accounted for 19 deaths in this study. This low figure could possibly be because of the relatively low prevalence of smoking among Ghanaian.¹⁰ The ban on smoking in public places in Ghana that has witnessed the collapse of Tobacco producing companies in the country has the potential of reducing the prevalence of smoking further. The low death rate from lung cancer contrasts sharply with the world figures where it is the leading cause of cancer deaths (leading cause in men and second in women) with tobacco being the most important risk factor. Tobacco caused 22% of cancer deaths and 71% of lung cancer deaths in 2000¹³ in the world with the highest incidence reported in the USA and Eastern European countries and lowest in Africa, Central and South America, and South Central Asia.¹

There were 81 mortalities due to cancer in the paediatric age group. The M: F ratio of 1.45:1 is similar to that reported by Segbefia et al of 1.3:1.¹⁴ In

this report Lymphomas followed by leukemias were the most common childhood cancers followed by Retinoblastomas and Wilms tumours.¹⁴ CNS tumors were rare, forming 3.4% of childhood cancers. An autopsy study in Korle Bu Teaching Hospital on childhood cancer mortalities placed CNS tumours second after lymphomas.¹⁵

Their findings contrasted sharply with what is noted in the Western world, e.g. UK, where brain, other CNS and intracranial tumours account for the highest cancer deaths (32%) in childhood.¹⁶ What is found in this study however corroborates what has been report in the United Kingdom with cancer of the brain being the main cause of cancer mortality (37.04%), followed by Wilms tumor.

Nasopharyngeal tumors accounted for most of the cancer mortalities (15.85%) in the adolescent age group (15-24 years) in line with the prevalence pattern of this disease from other studies. Nasopharyngeal cancers were noted to be common in the second decade of life (34.5% of nasopharyngeal cancers were in the second decade)¹⁷, in an institutional review of head and neck cancers in Komfo Anokye Teaching Hospital, Kumasi. It is said to largely affect a relatively young age group. A bimodal age distribution curve has been reported with the first peak in the 15 to 25 year group and another peak from the 60-69 years.¹⁷ Kitcher et al reported a peak incidence of nasopharyngeal cancers in Korle Bu Teaching Hospital to be in the 10 -19 year group, with 60.4% of cases being below 40 years.¹⁸

This study relied on the best available clinical and surgical mortality data available in the hospital over a decade and half and from this the study draws its strength giving a good representation of the surgical cancer mortalities. The study however had a limitation for not being able to incorporate haematological and gynaecological data which could have given complete information on all cancer mortalities in the hospital over the period. This limitation stemmed from the practical difficulty in obtaining that data in our setting.

Conclusion

Cancer mortality was responsible for a significant proportion of the mortalities in surgical practice; accounting for about a third of the deaths. Breast and prostate cancers being the leading overall causes of cancer deaths; whereas breast cancer mortality occurs through the young adult to the elderly age group, mortalities from prostate cancer mainly occur in the elderly. Brain tumours and Wilms tumours were the predominant cancer mortalities in the paediatric age group and nasopharyngeal cancers in adolescents. Breast, colorectal and urinary bladder cancers respectively were the leading cancer mortalities in young adults. In the middle aged group breast, gastric, pancreatic, prostate, colorectal and bladder cancers were the most common. Finally in the male dominated elderly group prostate, pancreatic, colorectal, and

gastric and breast cancers were the predominant cancers. Deaths due to lung cancer were low and contrasted with the world figures where it is the leading cause of cancer deaths in both men and women.

From the findings of this study the following recommendations are made;

1. Operationalization of national screening programmes for breast, prostate, gastric and colorectal cancers.
2. Advocacy for comprehensive coverage of cancer treatment by the national health insurance scheme in Ghana
3. Intensification of public health education on the dangers of lifestyle changes which may arise as the country transits into a middle income country
4. An urgent need for discussion towards revision of curricular in health training institutions in the country to emphasize oncology and for specialized training for the different categories of health care workers in surgical oncology.
5. The need for the creation of institutional, regional of national cancer registries which would better inform policy makers in allocating funds for prevention and treatment as well as research of cancers in our country.

Acknowledgement

We are grateful to Professor JN Clegg- Lamptey, the head of the surgical department, Korle Bu Teaching Hospital, for allowing us to use the mortality data in the department over the 15 year period for our study.

List of Abbreviations

CNS - Central Nervous System
 IARC - International Agency for Research on Cancer
 IQR - Inter-quartile Range
 M:F - Male: Female
 NCDs - Non-communicable Diseases
 P.O.Box - Post Office Box
 SD - Standard Deviation
 SPSS - Statistical Package for the Social Sciences
 UK - United Kingdom
 UNAIDS - Joint United Nation Programme on HIV/AIDS
 USA - United States of America
 WHO - World Health Organization

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MAJOR EXTREMITY AMPUTATION: THE KOFORIDUA EXPERIENCE

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Abstract

Background: Major extremity amputation is a relatively common surgical procedure but there is a paucity of local data concerning such an important part of surgical practice. This study was undertaken to unearth the demographics, the common indications, levels, revision and mortality rates of major extremity amputation in a large orthopaedic facility in Ghana.

Methods: A retrospective study of 94 consecutive patients with 95 major limb amputations between September 2010 to August 2013 was conducted and the results analysed.

Results: Overall, the commonest indication for amputation was trauma which was responsible for 44(46.3%) cases. Of the 95 amputations, 81(85.3%) were lower limb amputations with below knee amputations accounting for 45(47.3%) cases.

The age group 21 – 40years had the highest number of amputations with 38(40%) and the commonest cause in this age group was trauma. Average duration of hospitalization was 32 days with 8 patients (8.4%) requiring re-amputation. Six patients (6.4%) died.

Conclusion: Major limb amputation is drastically life altering especially in third world countries where livelihoods may depend on the ability to perform manual tasks and opportunities for changes in career paths/gainful rehabilitation do not abound. If traumatic conditions are prevented and expeditiously dealt with and chronic diseases like diabetes are carefully managed, there will be a significant reduction in limb loss following trauma or diabetic foot syndrome.

Key Words: Major extremity, Amputation, Koforidua

Introduction

With each passing year, nature scientists/archaeologists continue to unearth overwhelming evidence¹ of major limb amputations in the new stone age (4900 - 4700BC)^{1, 2}. Amputation were carried out for a variety of reasons, some for obvious life or limb threatening conditions and as forms of punishment for societal delinquents^{2,3}.

In the twenty first century, major limb amputations are still a significant part of a surgeon's workload anywhere in the world but the indications and patient demographics may vary considerably from region to region with complications of trauma^{4,7} and diabetes^{8,10} being the most likely causes.

Not many studies are available in Ghana which explore the salient demographic characteristics, indications, level of amputation, revision amputation and mortality rates thus necessitating evaluation of the cases seen at St. Joseph's Hospital, Koforidua, Ghana between September, 2010 to August, 2013.

St. Joseph orthopaedic hospital is one of the few orthopaedic hospitals in Ghana, situated in the Eastern

region which has a population of about 2.1 million people, it provides comprehensive trauma and orthopaedic care to a large catchment area with about 1,500 surgeries performed each year.

Method

A retrospective study of all major limb amputations carried out in St. Joseph Orthopaedic hospital over a three year period from September 2010 – August 2013. Information extracted from the patients records (theatre operation register and patient folders) were age and sex, indication for amputation, level of amputation, duration of hospitalization, revision amputation and mortality rates.

Results

Demographics

A total of Ninety five (95) major limb amputations in ninety four (94) patients (one patient had a bilateral amputation) were performed in the period studied. Of these, 58 (62%) were males and 36 (38%) were females giving a male to female ratio of 1.6:1. The age group 21 -40 years had the highest number of amputations with 38 (40%) cases (fig1)

All amputations for complications of diabetes were in patients aged more than 40 years with 14 (53.8% of diabetics) between the ages of 61-80 years.

Indications

Overall the commonest indication for amputation was trauma accounting for 44 (46.3%) amputations, the

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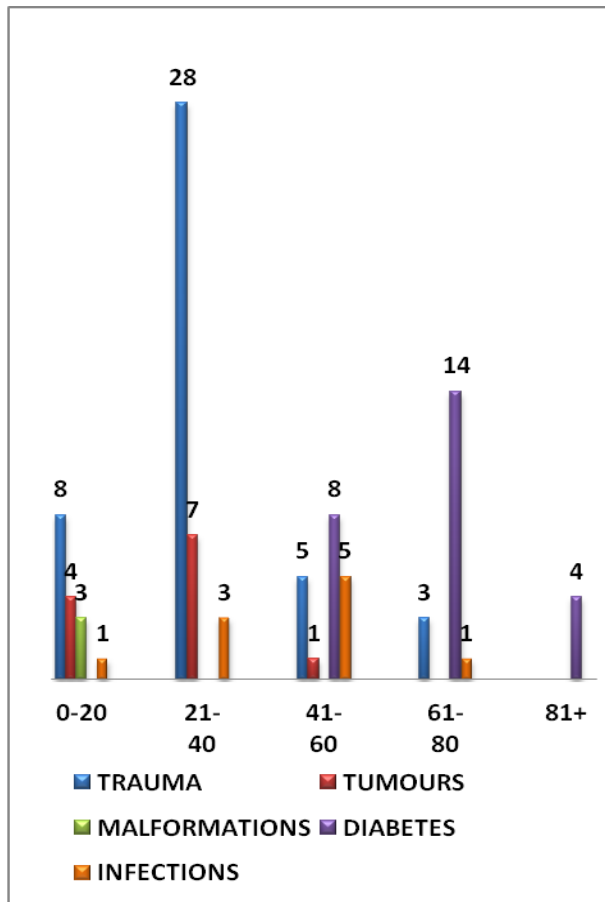


Fig. 1 second leading cause was complication of diabetes responsible for 26 (27.4%) major limb amputations (fig 2).

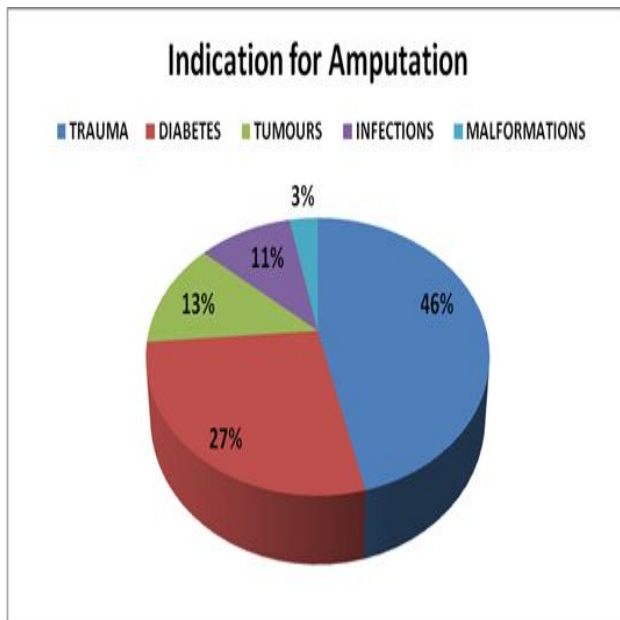


Fig. 2 Indication for Amputation Lower limb amputations were 81 (85.3%) with below knee amputations the most common accounting

for 45 (47.3%) of all amputations and 55% of lower limb amputations. Upper limb amputations were equally distributed between above and below elbow types totaling 7 each and making up 14.7% of all amputations. (fig 3).

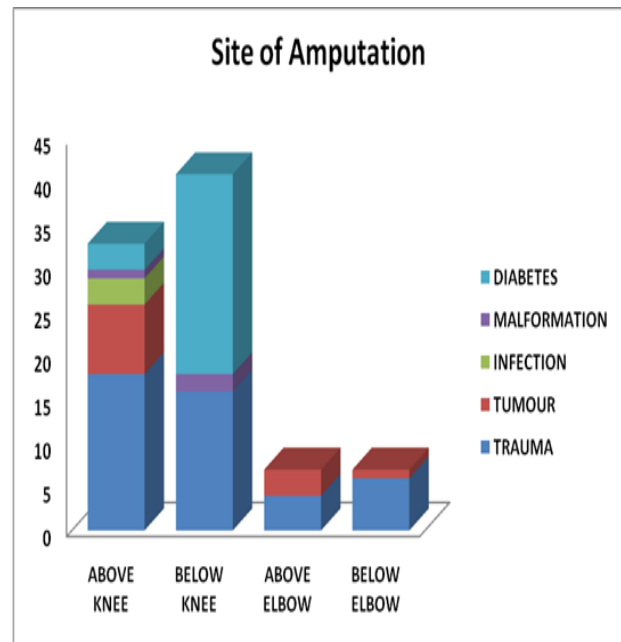


Fig. 3 Site of Amputation Trauma accounted for 18 (50%) of above knee amputations whilst complications of diabetes was responsible for 23 (51%) of below knee amputations making it the commonest cause of below knee amputations. Trauma, 10 (71.4%) was the most prevalent reason for an upper limb amputation.

Average duration of hospitalization

On the average, patients were hospitalized for 32.08 days. Fig 4

Indication	Average Number Of Days Hospitalized
Tumour	21 day
Trauma	34
Infections	40
Malformations	28
Diabetes	37

Fig. 4 Average duration of hospitalization

Revision amputation and mortality rates

Six of the patients died during the period of hospitalization (6.4%) and 8 patients (8.4%) required revision amputations.

Discussion

In our study the leading cause of major limb amputations was trauma. Other sub-regional studies^{5,7,11} have also shown trauma to be the leading

cause even in Nigeria, West Africa's most populous nation although other studies have implicated complications of diabetes as the prime cause^{10,12,13}. This reflects the increasingly heterogeneous nature of our societies where disease patterns are beginning to mirror those of industrialized societies.

The lower limb was the most commonly involved accounting for 85.3% of the amputations in this study. Reports from Kolkata⁶, Lebanon⁸, Tanzania¹⁰ and Cameroon¹² show a predominance of lower limb amputations. This highlights the relatively increased vulnerability of the lower limbs in traumatic incidents and diabetic complications.

Our patients spent an average of 32 days on admission. This is quite high compared to figures from Lebanon which show an average of 10.1 days⁸ and 22.4 days reported by Chalya et al in Tanzania¹⁰. A reason for this prolonged period of hospitalization is the relative lack of physiotherapy/rehabilitation services in most localities making it almost mandatory for patients to use the services provided by the hospital as in-patients until they are adjudged fit for independent ambulation/mobilization.

A mortality rate of 6.4% was recorded, lower than values from studies in Cameroon (8.9%)¹², Tanzania (16.7%)¹⁰ and Lagos University teaching hospital (11.8%)¹³. It is important to note that in the aforementioned studies with higher mortality rates, complication of diabetes were the commonest indication for amputation while in similar study where trauma was the leading cause of amputation, mortality rate was also low at 4.7%⁷ possibly reflecting the effect co-morbid conditions have on survival rates.

Revision amputation rate was 8.4% much lower than 17.5% recorded by Rommers et al⁹ and 22% reported by Ogeng'o et al⁴. This can be explained by the preponderance of amputations for trauma and a considerable number (38%) of the amputations were above knee amputations with better stump muscle coverage and attendant improved vascularity.

Conclusion

Major limb amputation is a life changing event and the chief causes are largely preventable. Provision and upgrading of trauma facilities to expeditiously deal with limb trauma combined with public education on general safety measures

(Road, workplace etc), integration of pre-emptive limb care in the treatment of all diabetics and early detection and treatment of limb tumours will go a long way in reducing limb loss.

Provision of more centres for rehabilitation will reduce hospital stay and make reintegration into society easier for amputees.

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TRENDS OF PERMANENT AND LONG ACTING REVERSIBLE FORMS OF CONTRACEPTION IN KORLE-BU TEACHING HOSPITAL ACCRA

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Abstract

Objective: To determine the trends of permanent and long acting reversible forms of contraception use over a 5-year period (2011-2015)

Methods: Hospital based retrospective study. Data extracted using records from the family planning unit, theatre registers and records from the statistics department of the Korle-Bu teaching Hospital, from 1 January 2011 to 31st December 2015.

Results: There were 1982 female sterilizations and 9 vasectomies over the 5-year period. The mean age of sterilized women decreased from 35.7 years to 34.5 years, whereas the mean parity decreased from 4.0 to 3.4. The number of women sterilized each year

however declined from 439 in 2011 to 377 in 2015. There was a general upward trend in the number of users of Implant and IUCD.

Conclusion: There is a decline in female sterilizations with a very small number of vasectomies in the Korle-Bu Teaching Hospital over the last 5 years. However, there has been an increasing trend in Implant and IUCD use, which may be partly responsible for the declining trend in female sterilization. Against the background of a declining total fertility rate which stands at 4.2 and the mean parity of 3.4 for clients who had female sterilization, there could be a higher unmet need for permanent methods.

Key Words: female sterilization, vasectomy, implants, intrauterine contraceptive device.

INTRODUCTION

Over the last decade, contraceptive prevalence has risen from about 10% to nearly 60% in developing countries, but still about 1 in 4 births in developing countries (outside China) is unwanted. More than 120 million women in these countries who do not want to become pregnant do not use contraceptives and nearly 600,000 women die each year from pregnancy-related causes and between 67,000 and 204,000 of them from unsafe abortions¹. Evidence from around the world indicate that the risk of maternal or infant illness and death in both the industrialized and the developing world is highest in four specific types of pregnancy, namely; pregnancy before 18 years, after 35 years, after four deliveries and spaced less than two years.

However, in developing countries as a whole, women over 35 years usually have more than four children, so that their pregnancies fall into more than one high risk category.³ The total fertility rate in Ghana is 4.2.⁴ The most unfortunate maternal death is one that occurs in a woman who has no desire to have any more children, but who is dying as a result of complications of unsafe abortion, pregnancy, labour and puerperium.

Globally, tubal occlusion is the single most commonly used method of fertility regulation, accounting for about one-third of all contraceptive use.³

It is traditionally viewed as the final and most effective form of contraception. However, this view is being reconsidered in the face of more recently developed, effective reversible long term contraceptives.

In Africa, the rate of voluntary sterilization is one of the lowest in the world. In 1980, while the estimated number of couples controlling fertility by voluntary sterilization in the world was 100 million, Africa contributed to this by only one million. It is in the developing countries that 85 % of the world's babies are born. Ninety-five percent (95%) of infant deaths take place in these countries where ninety-four percent (94%) of maternal deaths occur. The rapid population growth contributes to the economic difference between the developed and the developing world and to the massive difference in health.¹

It is noted that each voluntary sterilization is estimated to avert 1.5 to 2.5 births,¹ and so voluntary sterilization is of outmost importance if the exponential population growth of Africa is to be contained.

There is evidence that desired family size is smaller than achieved family size and also that 50 % of all third world women with 3 or more children do not want any more¹. This implies that approximately half of these third world women will require permanent methods or at least effective long- term contraceptive till menopause.

It was against this background of rapid population growth in the developing world and the low acceptance rate of various forms of contraception coupled with bigger family size than desired, that this study was undertaken to find out the trends with permanent and long acting reversible contraception at the KBTH over the last 5 years.

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Conflict of Interest: None Declared

Materials and Methods

This was a retrospective study at KBTH looking at female sterilization, vasectomy, implant insertions and intrauterine contraceptive device use annually over a 5-year period (1st January 2011- 31st December 2015). The data were collected from the registers in the family planning unit, the obstetric and gynecology theatre and also from the labour and recovery ward records. The data included the age, parity and the yearly number of sterilizations, Vasectomies, Implant and IUCD insertions. Analysis of data was by the SPSS-16 Version software.

Results

Table 1: Mean age and Parity by Year of female sterilization

Year	Mean age [years]	Mean parity
2011	35.67 (24-47)	4.02 (1-11)
2012	35.46 (25-47)	3.82 (1-10)
2013	35.29 (24-50)	3.65 (1-10)
2014	35.28 (25-49)	3.57 (1-8)
2015	34.50 (26-43)	3.41 (1-8)

There was a general decrease in both mean age and parity.

Table 2: Total number of Sterilizations, Implants, IUCDs & Vasectomies

	Sterilization	Implant	IUCD	Vasectomy
2011	439	1799	2366	0
2012	396	2038	2635	1
2013	363	2393	2949	1
2014	407	2293	2815	0
2015	377	2698	3068	1

The total number of female sterilizations decreased over the years from 439 in 2011 to 363 in 2013, and then an increase in 2014 and a decrease again in 2015.(Table 2)

The youngest was 24 years and the oldest was 50 years. The mean age decreased from 35.67 years in 2011 to 34.50 years in 2015. (Table1)

The mean parity showed a downward trend from 4.02 in 2011 to 3.41 in 2015. The lowest parity was one (1) and highest was 11(Table 1)

Implant use increased from 1799 insertions in 2011 to 2393 in 2013, it decreased in 2014 by 100 insertions and increased again in 2015 to 2698 insertions. Jadelle was the main type of implant provided until Implanon, Sinoimplant(Femplant/Zarin) and Nexplanon (Implanon NXT) were introduced in

2013,2014 and 2015 respectively. From 2013 to 2015 Implanon insertions increased from 339,724 and 942 respectively. SinoImplant also increased from 33 in 2014 to 58 in 2015. Thirty-one insertions of Nexplanon were done in 2015.

Insertions of IUCD followed a similar trend as implants showing a general increase over the years except for small decrease in 2014. Copper IUD has been the main IUD over the years with the Levonogestrel IUS introduced to the centre in 2013. Only 10 insertions were done in 2013 and one in 2014 with the “Mirena” been the specific brand. In the later quarter of 2015 the generic LNG-IUS was supplied by the Ghana Health Service and only 8 insertions were performed.

The numbers of vasectomies was 9 and did not show any pattern. (Table 2). No vasectomies for contraception are performed at urology anymore after they had trained the reproductive health and family planning consultants in this procedure. The last ever joint vasectomy surgery was in 2010, not covered by this review.

Discussion

Healthy women are fertile until about age 50 to 51years; healthy men are fertile essentially throughout life. Because most couples have all the children they want well before the end of their reproductive life span, they will need effective contraceptive protection against unwanted pregnancies for many years. Even though in Ghana, the established age at menopause is 48 years, early marriages and low acceptance of contraception for various reasons, makes couples achieve desired family size at an earlier age far from menopause and thus effective permanent contraception is very necessary if unwanted pregnancies are to be avoided.

Ideally, a couple should consider both vasectomy and female sterilization as options. They are comparable in effectiveness, but vasectomy is simpler, safer, less expensive and even probably more effective than female sterilization and no life threatening complications arise should it fail, as opposed to ectopic pregnancies resulting from failed female sterilization. However, unfortunately, vasectomy has very low patronage in the developing world, especially in places where polygamy is extensively practiced.

The declining trends in sterilization over this period are comparable to what was found in New South Wales, Australia and United Kingdom.^{3,8} In U.K the decline since 1996 was partly attributable to the introduction of levonorgestrel-releasing IUD in 1995³ and also to the fact that there is new information revising long term failure rates for tubal occlusion⁹, now estimated to be 1 in 200 ¹⁰. This current study at Korle-Bu Teaching Hospital (KBTH) bears similarity in terms of decline in sterilizations in Ghana as reported in the 2014 annual report on Reproductive and Child health¹¹.

The decreasing trend in the overall number of sterilizations in KBTH could partly be due to the fact that new, safe, long acting reversible contraceptives such as Implants (Jadelle, Implanon, Nexplanon and Zarin) are available. An increase in sterilization resulted in a decrease in LARC. This was observed in the 2014 report. However the reasons for this particular pattern in 2014 are not clear. This could be partly explained by the fact that district staff had training in the provision of LARC especially on implants and so this decreased the client load at this time as clients are usually mobilized for these training. Regarding the IUD type patronized, certainly cost was important since the Mirena was more than 10 times the cost of the copper IUD. The cheaper LNG-IUS was only supplied to the centre towards the end of last year.

The eventual decline of the mean age of sterilizations to 34.5 years was comparable to the 34.4 in New South Wales and 34.55 in U.K."⁸ An increase in mean age is preferable to a decrease since failure rates and the incidence of regret are higher in women below 35 years of age. The mean parity decreased from 4.02 in 2011 to 3.41 in 2015. The reasons for this decrease are entirely unclear but the downward trend of the total fertility rate may be a factor. In addition the socioeconomic demands could be a factor in limiting family size.

This study was limited by the fact that it did not look at the factors affecting client choice of various types of LARC and previous contraceptive use by clients who had sterilization. Against this background no appropriate sub-regional comparison could be made of such trends

Conclusion

This study has shown a declining trend in female sterilization and an increasing trend in LARC use. With the decreasing mean age and parity for sterilization more research is needed to determine the levels of unmet need for permanent methods and interventions to improve uptake especially vasectomy.

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DECISION SUPPORT TOOLS IN MEDICINE: EVIDENCE-BASED MEDICINE APPROACH IN TAMALE TEACHING HOSPITAL

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Abstract

Objective: To determine whether laboratory results match the preliminary diagnosis, using a model of malaria diagnosis by clinical staff at Tamale Teaching Hospital (TTH), Ghana.

Methods: Data of outpatients diagnosed with malaria in 2012 were collected retrospectively from clinical notes. Data of the clinicians who provided the preliminary diagnoses were collected by self-reporting questionnaire. Statistical analyses were performed with Epi-Info and SPSS software.

Results: A total of 344 patients were diagnosed with malaria in 2012, consisting of 186 females and 158 males. The age ranges between one month and 80 years. Forty-four clinicians responded to the questionnaire, consisting of 12 females and 32 males with mean \pm SD age of 40.2 \pm 10.0 years. Respondents included consultants, medical officers, house officers,

physician assistants, physician specialists and senior nurses, with mean \pm SD years since qualification of 11.6 \pm 9.8 (range: 1-40 years). Nearly one-half (49%) of the clinicians reported not normally requesting laboratory investigations for suspected cases of malaria, thus not following an evidence-based approach for preliminary diagnosis. Slightly over one-half (51%) of the preliminary diagnoses of malaria in suspected cases were incorrect. However, statistical assessment of the clinician's preliminary diagnosis and the results from laboratory tests for malaria parasites showed a correlation ($p=0.6548$ at 95% CI).

Conclusion: Practice of evidence-based medicine and establishment of a technology-based healthcare system can lead to decrease incorrect diagnoses and inappropriate health care management.

Key Words: *Clinical Decision Support Tools; Evidence-Based Medicine; Diagnostic Errors, Malaria*

INTRODUCTION

Relentless efforts have been put forth to develop effective treatments for the most prominent diseases and to institute management schemes that will allow for their delivery to the patient population. Yet, initiation of any treatment relies exclusively on diagnosis of the condition by the healthcare providers (i.e. clinicians), which is itself based upon a probability approach (i.e. an estimate of the most probable diagnosis among the suspected conditions).

Clinical evidence improves the chance of making an accurate diagnosis, and more importantly for initiating the proper therapeutic intervention. This approach, known as evidence-based medicine, has been a core tenet of Western medicine for ages. The more ancient Eastern medicine, however, employs a more subjective approach, relying on the clinician's wisdom and social traditions and which carries a greater risk of misdiagnosis and delay in appropriate therapy. As

such, the 'stasis' of the traditional Chinese and Hindu medical systems reflects the civil and moral orders of their respective cosmologies, while the 'physis' — the Greek term for 'nature' or 'change' from which we get the term 'physics' — of the West's reflects the evidence-based approach¹.

Medical errors are both harmful to the patient and costly to the healthcare system. A report from the United States' Institute of Medicine (1999) ranked medical errors as the eighth leading cause of death nationally, accounting for up to 98,000 annual deaths². Healthcare managers and clinicians are valiant in their ongoing efforts to reduce these numbers. A wide range of improvements have been made to the clinical practice of medicine worldwide, benefiting patient outcomes remarkably³. One such improvement is the technology-based clinical decision support system (CDSS), which provides doctors with patient-specific information.

The CDSS has emerged as a useful tool in organized and rapid dissemination of information allowing for a more comprehensive understanding of a patient's condition. It may also, however, represent a tool to improve physicians' compliance with evidence-based medicine practices. The use of decision support tools in a medical facility, such as a hospital, to facilitate the practice of evidence-based medicine promises to substantially improve the overall quality of the healthcare provided to its patient population⁴. Indeed, beneficial outcomes have already been reported

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along a number of dimensions, including compliance with treatment standards, reduced treatment costs, and improved patient outcomes⁵.

In Ghana, the healthcare governing and other funding agencies have exerted extensive efforts and resources towards controlling and treating malaria and HIV/AIDS. These efforts have extended beyond the healthcare facilities, and out into the daily living environment; for example, widespread media campaigns have been launched to educate the citizenry on behaviours and practices that protect against contraction or transmission of communicable diseases.

Besides the effects on human health, communicable diseases have serious impact on a country's economy, slowing or halting growth and bringing about severe cycles of poverty. For malaria, in particular, it has been estimated that up to 10–12 billion US dollars of domestic product are lost every year in Africa alone⁶. Accurate diagnosis and timely initiation of appropriate therapy are crucial aspects of any effective healthcare treatment program. Unfortunately, the late adoption of Western medicine practices in many African nations poses a challenge.

This study was designed to determine the extent of cases of preliminary diagnosis of malaria in a representative tertiary hospital that match with the subsequent laboratory findings. The findings indicate the relevancy of laboratory findings to medical decision-making and provide insight into the current approach taken by clinicians to evaluate care against a pre-set standard and how to improve such to benefit both patient outcome and healthcare costs.

Background

Development of a country's healthcare industry is non-linear and dynamic⁷. Ghana is no exception, and is persistently challenged by increasing costs of care and scarce logistics for healthcare providers. Efforts by the Ghanaian government to provide good quality healthcare have included publication of the Information and Communication Technology (ICT) in 2005⁸, wherein ICT is promoted for its ability to improve the organization and administration of hospitals and management of patients, especially for those afflicted by the most common ailments affecting the local population.

Malaria represents an important threat to public health in Ghana. Of the four different species of malaria that infect humans, *Plasmodium falciparum* is the most lethal and accounts for the majority of infections in Ghana. The non-specific symptoms of malaria further complicate diagnosis and highlight the importance of using clinical evidence, such as that from a blood test⁶ for accurate clinical management.

In the outpatient department of Ghanaian hospitals, most cases of malaria are diagnosed on the basis of clinical symptoms, so that treatment is presumptive rather than based on laboratory confirmation. Moreover, malaria parasitaemia is

common among endemic areas, so that a positive laboratory result does not necessarily mean that the tested patient has developed the malaria condition. The main clinical symptoms of malaria — fever and general weaknesses are non-specific and may be due to any other infections⁹.

The mission of the TTH is to promote quality and affordable tertiary healthcare that is delivered by well-trained, highly motivated and customer-friendly professional health staff. The hospital abides by a mandate to provide advanced clinical health services in support of tertiary care while serving as a training ground for undergraduate and postgraduate medical professionals. Part of this mandate includes research efforts to advance understanding of the particular health issues of the population of patients served for the purpose of improving the conditions of people's health in the region (i.e. northern Ghana) for possible expansion throughout the entire country.

Materials and Methods

Study Design

Malaria was chosen as the focus of this study since it represents a disease condition that demands most of the clinical care given by Ghanaian hospitals, accounting for nearly 50% of all admissions and outpatient visits. Since the clinical data of the TTH does not deviate from the nationwide data generated by the Ghana Health Service, we used it to conduct our study. The TTH was also selected because of its high rate of outpatient attendance due to its roles as a teaching hospital and as a tertiary health service provider serving nearly 5 million patients in northern Ghana. It also offers healthcare services to the neighbouring countries of Burkina-Faso and Togo, and as a healthcare facility that is conveniently accessible to a wide variety of patients.

Data Collection

We sort out data of patients with preliminary diagnosis of malaria, given by any member of the clinical staff in 2012 at the outpatient (OPD). For the purposes of investigating the rate of diagnoses based on evidence, the rate of usage of decision tools by the clinical staff and the rate of preliminary diagnosis matched to clinical evidence.

Patient data was collected retrospectively from the clinical notes from patients' records at the hospital. First, the complete collection of paper records (books) from 2012 for all 7 consulting rooms of the TTH, which operate simultaneously, were targeted for random selection to search for patients who received preliminary diagnosis of and treatment for malaria.

The total number of patients was 344.

The clinicians who provided the preliminary diagnosis for each of the 344 patients were offered a self-report questionnaire to obtain study-relevant data. In addition, some of the clinicians were interviewed in-person, with the aim of determining opinions on topics

such as efficiency of the relevant laboratory equipment. Statistical analyses were performed with Epi-Info and SPSS software.

Results

The 344 patients selected for study consisted of 186 females and 158 males with average age of 22±22.5 years (reported as mean ± SD; range: 1 month - 80 years, and mode: 1 year).

The 44 clinicians consisted of 32 males and 12 females with average age of 40.2±10.0 years (range: 26 - 73 years). The clinicians represented consultants (20.5%), medical officers (41.0%), house officers (4.5%), physician assistants (6.8%) and physician specialists (22.7%), as well as senior nurses (4.5%) including nurse in-charges and a deputy director of nursing services. The clinicians had an average of qualified years of 11.6±9.8 (range: 1 - 40 years).

portion (2.3%) of the clinicians reported not knowing what evidence-based medicine is.

Table1. Clinicians’ self-reported responses to having conflicting thoughts when giving preliminary diagnosis (without clinical evidence)

Response	Frequency	Percent
Sometimes	30	68.2
Never	11	25.0
Always	3	6.8
Total	44	100.0

Source: Field survey, 2013

More than one-half (68.2%) of the clinicians reported sometimes having conflicting thoughts when giving a preliminary diagnosis (without clinical evidence). Only one-fourth of the clinicians reported feeling confident (no conflicting thoughts) when giving their patients preliminary diagnoses. Very few (6.8%) of the clinicians reported being indecisive about the preliminary diagnosis.

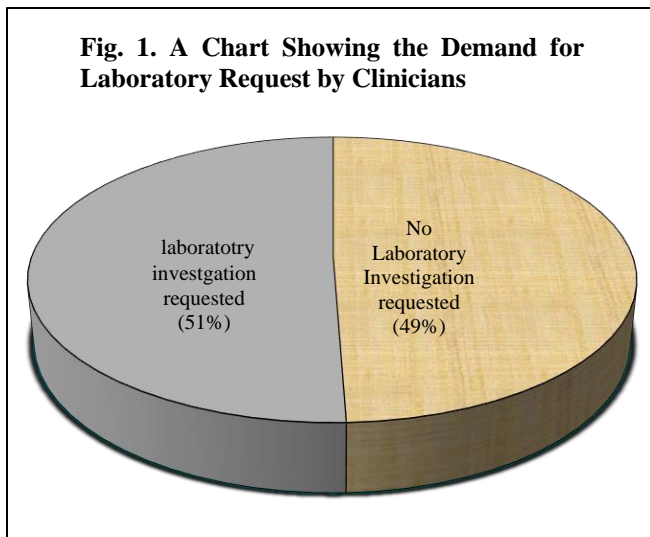


Fig 1. Chart showing the demand for laboratory request by clinicians

Nearly one-half (49%) of the clinicians who treated the patients with suspected malaria did not request laboratory investigation, thus the evidence-based approach was not followed in these instances. A little over one-half (51%) of the preliminary diagnoses of malaria did not match the true infection status of these patients.

Ninety-eight percent of the clinicians expressed interest in working with computers for their healthcare practice. Less than one-half (43.2%) of the clinicians reported a moderate level of familiarity with clinical information technology; much fewer reported a high level or very high level of familiarity with clinical information technology (22.7% or 15.9%, respectively).

Most (68.2%) of the clinicians reported that they considered evidence-based medicine as highly relevant to their professional practice of medicine. A very small

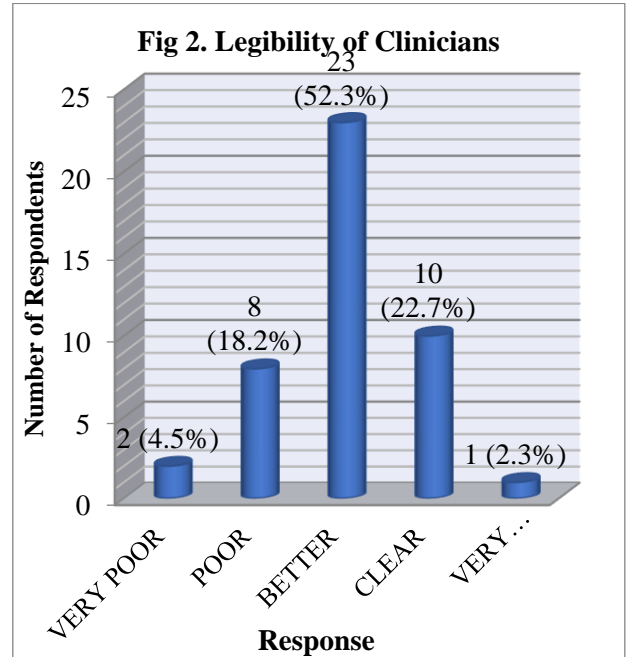


Fig 2. Legibility of Clinicians

Since the patient records were hand-written, we queried the clinicians as to whether the handwriting of their colleagues may have hindered their ability to assess the patients’ notes. Slightly more than one-half (52.3%) of the clinicians reported that the handwriting was not legible. Only 18.2% of the clinicians reported

the legibility of their colleagues' writing to be poor and 4.5% reported it to be very poor. Similarly, 22.7% and 2.3% of the clinicians reported the legibility of their colleagues' handwriting to be *clear* and *very clear* respectively. Overall, the clinicians' preliminary diagnoses of malaria involved 98.3% (338) of the 344 medical records of all cases initially classified as malaria from the outpatient register. Of the patients who received a preliminary diagnosis of malaria, only 166 underwent laboratory testing to confirm the diagnosis. Among those, 60 received positive confirmation of the malaria diagnosis and 66 received negative results that refuted the preliminary diagnosis; the remaining 40 patients had no laboratory results available in the medical records.

Statistical analysis showed no significant difference in the clinician's preliminary diagnosis of malaria and the corresponding laboratory results of malaria parasites ($p=0.6548$ at 95% CI).

Discussion

This research study was designed based on the following formulated objectives for investigation.

First, the generally accepted theory is that there is a positive association between a clinician's preliminary diagnosis of malaria and the corresponding laboratory test's detection of malaria parasites. This theory was confirmed in the current study, as the statistical analysis indicated no significant differences between the TTH clinicians' preliminary diagnosis and the corresponding laboratory findings of malaria. Thus, the number of cases with discrepancies between the preliminary diagnosis and the clinical evidence are acceptable.

The second key objective of this study was to determine the need for decision support tools in healthcare delivery at the TTH. The clinicians in this study indicated a prevalent problem of experiencing conflicting thoughts when coming up with a preliminary diagnosis (without clinical evidence) and of being able to easily read the hand-written notes on patients written previously by their colleagues. These two problems represent challenges to provision of continuous and accurate medical care. In addition, the clinicians also indicated being unable to follow a patient's progress over time due to inadequate recording or loss of records for that patient. Having medical records in an electronic format and organized in a central database, such as facilitated by the use of ICT and decision support tools, will not only allow for the ready availability but also more comprehensive and accurate recording and interpretation, thereby reducing the risk of medical error and the cost of healthcare.

The overall attitude of the clinicians in this study was promising, with a near complete expression of interest in working with computers in the professional healthcare setting. Even though the majority of the clinicians indicated that they do not know what CDSS is precisely, they still viewed it as a potentially

beneficial tool to improve their medical decision-making.

The fourth objective of the research was to investigate the attitudes towards evidence-based medicine among the clinicians. The 49% of clinicians who did not request any laboratory testing to confirm their preliminary diagnosis indicated a corresponding attitude of indifference towards adopting evidence-based practices. Ultimately, instituting evidence-based practices may be a challenge in this environment.

Limitations

Research of this magnitude cannot be conducted without some limitations, particularly those related to the time and effort involved and to the financial resources required to support them. Hence, our small-scale study was as a result of these limitations, and we attempted to overcome them by performing the sampling of medical records and giving of the self-report questionnaire in a single facility.

Another important limiting condition of the current study is the diversity of interventions that were used for each of the 344 patients' records included in the study. The interventions were tailored to the clinicians' expert opinions of the needs for each clinical situation, such as individualized protocols designed for specific work-up pathways.

In addition, the sensitivity and specificity of various forms of laboratory analyzer devices for the malaria parasites were not considered in this study either, which could be a source for other errors in diagnosis. In spite of all these challenges, however, the research provides useful insights into clinician attitudes and areas for improvement in clinical management of patients in Ghana.

Conclusion

The study gave insights into how some errors in misdiagnosis may be remedied by the use of CPOE, namely by eliminating confusion caused by illegible writing in patients' medical records and lost or missing records. Hence, Practice of evidence-based medicine and establishment of a technology-based healthcare system can lead to decrease incorrect diagnoses and inappropriate health care management.

Recommendations

1. Health information technology certainly has great potential to improve patient safety, especially when the strategy of computerized provider order entry (CPOE) is employed. Yet, the potential of health information technology remains unrealized in Africa.
2. Optimal use of decision support tools in medicine requires the complete harmonization of multiple hospital and ambulatory information systems, including those of the clinical laboratory,

radiology, medical recordkeeping, pharmacy and, possibly, health claim management.

3. The enthusiasm cited by the clinicians in the present study for use of information technology in their practice of medicine is promising. It is therefore recommended that the Ghanaian government and other stakeholders adopt the clinical decision support system in the TTH, in particular, and consider it for adoption in healthcare facilities across the entire country of Ghana.
4. The range of patient disease outcomes assessed in this study reveal the known lack of medical investigations for clinical interventions, which would otherwise be used with the aim of decreasing diagnostic errors and subsequent initiation of inappropriate medical interventions.
5. Additional work is needed to determine how to promote and firmly establish evidence-based approaches so that the rate of medical diagnostic errors is minimized to the greatest extent possible. It is expected that with heightened awareness of this problem, more studies will be conducted, even privately within individual healthcare facilities or as large-scale cross-country studies, such as randomized controlled trials to test different approaches.

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Finally, we duly acknowledge the authority of TTH for allowing us to carry out this study.

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SPECIAL ARTICLES

MENTAL HEALTH: NEW APPROACHES TO AN OLD PROBLEM

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Summary

An overview of scientific advances in our understanding of mental illnesses over the last half century is considered within the Ghanaian context. Mental illnesses result from a complex interplay of brain circuitry, neurotransmitters, genetics, psychosocial and environmental factors. Stigma, based on ignorance continues to be a significant barrier to care in Ghana.

Additionally, the high cost of mental illnesses resulting from prolonged disability, lost productivity and direct and indirect treatment costs should inform strategic plans for the prevention and treatment of psychiatric illnesses. With a psychiatrist to patient ratio of 1:2 million people, it is imperative that all physicians and other healthcare providers be psychiatrically informed practitioners, if we are to adequately care for our mentally disabled citizens.

Psychiatric illnesses are significant in at least 50% of

primary care visits. Untreated, they contribute to poor medical outcomes and suicide. Major psychiatric and substance use disorders are chronic medical illnesses of the brain, essentially no different from chronic illnesses of other organs like diabetes and hypertension.

Implementation of the Mental Health Law, should be guided by scientific evidence and proven multi-modal treatments, including psychopharmacology and culturally informed psychotherapeutic and community-based interventions. The law should form the basis for inter-disciplinary training in public mental health education and stigma reduction among teachers, nurses, physicians, social workers, judicial law enforcement agencies, pastors and others. Modern communications technology is currently underutilized in supporting sustainable solutions that offer protection of human rights and the promotion of resiliency and recovery, based on scientific evidence.

Key Words: Mental health, Stigma, Prevention, Education and law

Introduction

The theme for the conference is *Mental Health in Ghana; New Approaches to an Old Problem*. The problem is old as the ages but I am not entirely certain that I have all the new approaches that will be required and certainly not enough time to cover all of what needs to be addressed. However, I would like to start off by defining the few terms which will guide us over the next half hour or so.

I prefer to use the term mental illnesses rather than mental illness because the brain as complex as it is can fail a person in numerous ways. Some of the conditions are manageable without a great deal of medical intervention but many are severe enough to require significant medical treatment over a person's lifetime.

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Mental illnesses refer to a set of medical conditions that affect a person's thinking, feelings, mood, and behavior and thus their ability to relate to others and their environment in daily functioning.

Mental health conditions or psychiatric disorders affect hundreds of millions of people world-wide and as recently as the beginning of this century, the World Health Organization estimated that over 154 million people suffered from Major Depressive Disorder globally, that 25 million people suffered from schizophrenia and that over 100 million people suffered from alcohol and drug abuse disorders¹. About a million people die each year from suicide². This gives us an idea of the scope of the problem and helps us to determine how best to approach the issues that result from undiagnosed and untreated or poorly treated mental illnesses.

Mental functions are a reflection of brain processes. The brain in our field is shared by neurosurgeons, neurologists and psychiatrists. Joel Paris reminded us that neurologists deal with axons and that psychiatrists address synapses³. Neurosurgeons of course handle the gross and obviously visible lesions and malformations of the brain and related structures. The complexity of the brain as an organ has continued

to amaze us over time. It is estimated that the average brain has over 200 billion neurons and each neuron is connected to between 5 – 200,000 other neurons. There are 50 times more glial cells than neurons. We also know that over 50% of the human genome is connected to functions of the brain and the central nervous system⁴.

Over time, we have come to understand that mental illnesses and particularly the more obviously severe ones, result from failures of neuro-transmitter function and brain circuitry which lead to symptoms that are cognitive, emotional, and behavioral. We have also come to understand that many conditions that would be observed quite commonly such as major depression (5%), schizophrenia (1%), or bipolar disorder (3%) are conditions for which obvious signs are present usually by the second decade of life. This means that mental illnesses often have their onset in childhood and adolescence.

In our capital city of Accra, with a population of 4 million, we can expect about 40,000 people with schizophrenia, 200,000 with major depressive disorder and 120,000 with bipolar disorder. We have come to recognize numerous biological markers for many previously poorly understood problems of the mind. Based on the presence of specific biological markers, social issues such as childhood maltreatment in specific individuals can lead to a trajectory of severe behavioral disorders such as conduct disorders and antisocial personality disorders. Biological markers have also been identified for major depressive disorders, schizophrenia, PTSD, panic disorders, Alzheimer's disease, and even for cannabis induced psychosis. In the last year, a biological marker, the SKA2 gene, was also found for the risk completed suicide⁵.

Stigma as Barrier to access

Moving away from neurobiology and moving into the realm of society, stigma continues to be the biggest barrier to access for the appropriate treatment of mental illnesses. Patients who are suffering tremendously from these distressing and overpowering conditions postpone or avoid treatment until it is too late because of stigma. Stigma of course, is based largely on a poor understanding of mental illnesses and also on the false expectation that mentally ill individuals are inherently violent and are destined to harm to others. It is important as physicians that we see ourselves as the translators of the basic sciences of the brain (i.e. the clinical neurosciences) to the general public so that these conditions are de-mystified just as other common conditions like diabetes are now better understood by the lay public.

Poorly supported belief systems lead to the deprivation of basic human rights of our fellow citizens and family members who are already disabled by mental illnesses. There is a great deal of therapeutic nihilism around psychiatric disorders which upon the examination of evidence, has no basis at all⁶.

Primary and secondary prevention

The prevention of psychiatric illnesses should be an important dimension of the public health agenda of any developing countries like ours. The prevention of psychiatric illnesses is primarily related to the identification and reduction of biopsychosocial risk factors that are identified and modifiable with careful long range planning and appropriate interventions. Prevention is also successful if protective factors and the promotion of resilience form part of the appraisal of our public health view of mental illnesses. We have to begin to apply evidence based interventions both for prevention and treatment of these disorders.

Prevention examples include the reduction of the incidence of specific disorders such as substance abuse, major depressive disorders, and post-traumatic stress disorders. The reduction of risky behaviors such as substance use and unsafe sex and the reduction of measurable outcomes such as suicide, teen pregnancy, school drop-outs and delinquency. The reduction of these variables when combined with the promotion of mental health and wellness set us on the path to a better place.

We all understand that the primary prevention relates to reduction of the incidence of new disorders and that secondary prevention is related to the reduction of the prevalence of disorders. Tertiary prevention relates to the reduction of the disability associated with disorders. All of the principles of basic public health apply to the field of psychiatry in what Gerald Caplan referred to as Population – based Psychiatry. This is particularly important because, as I will point out later, the cost of not treating psychiatric disorders is immensely disproportionate to the cost of neglecting many physical disorders that we pay attention to daily. The other aspect of prevention includes universal preventative interventions that can be targeted to an entire population, selective preventive interventions that are targeted to members of a population with known higher than average risk of particular conditions and indicated interventions that are targeted to members of the population with prodromal symptoms of the disorders, such as first episode psychoses. This would for example mean an adolescent who has marked behavioral change, such as social withdrawal or sudden academic failure may be in the prodrome of a major psychiatric disorder such as major depressive disorder or schizophrenia which if not identified accurately and early, or treated, could lead to a poor outcome such as florid psychosis or suicide. The task of accurate diagnosis in such a situation often falls on a non-psychiatric physician in the community⁷.

So, in our current situation with the limited resources we have, what is the best way of implementing a preventive psychiatry approach to mental illness? I would say that the point of intervention with the greatest possible impact on the population would be school based interventions. In spite of being resource poor, all successive

governments have invested in the educational infrastructure of the country to some degree. I would propose that mental health nurses, bachelor and masters level psychologists and clinical social workers who are well trained and oriented to preventative psychiatry should become an integral part of every school's staff. It is in the educational environment that young people who are at risk for developing psychiatric disorders are probably best identified early. Where there are poor school and family bonds the risk for psychiatric disorders increases. It is also in the school environment that mental health professionals like these, can assist teachers and parents with the early identification of new problems and suggest appropriate behavioral interventions to prevent a complicated and costly outcomes for these conditions. Many who have heard me speak before will remember that I do not subscribe to the idea that a child will "grow out of the problem". Once a problem is identified as such by people who are closest to the child, either in the family context or in the educational context, the problem must be acknowledged and respected as such. In our role as physicians, if we do not know what the problem is, we must begin to find answers to the problem through consultation with mental health experts including psychiatrists. If we do not, these problems actually become more complicated with very negative outcomes such as psychotic illnesses or completed suicides. In secondary schools and tertiary institutions the role of in-house mental health professionals is critical because as I intimated earlier, it is at this stage of development that the first symptoms of major psychiatric disorders emerge. Issues related to substance abuse, interpersonal relationships and academic pressures all converge at this stage of life and if our institutions are not well resourced with mental health professionals, we fail in our preventative role with the students⁸.

Tertiary Prevention

In returning to tertiary prevention, which has more to do with the reducing disability through treatment, we are better served by recognizing major psychiatric illnesses as chronic medical conditions. They are as chronic as essential hypertension or diabetes. All of these conditions tend to have a genetic or biological risk which in interaction with a person's environment can result in the expression of a full blown illness. We must approach major psychiatric illnesses with evidence based treatments and not with clinical intuition or unsystematic clinical experiences. We must use treatments that have been rigorously tested and shown to be advantageous. This is no different than how an internist would approach a patient with cardiovascular risk who has significant hypertension or a patient who has type I or type II diabetes. A few years ago in a class at one of our medical schools – a student expressed pessimism about the outcomes for major psychiatric illnesses to me. He

said that you don't "cure these patients" I took a deep breath and I told him that for the last 26 years I have been taking anti-hypertensive medications on a daily basis and that my physician specialist had not cured my hypertension. It was being managed with treatment and in the same way, patients with schizophrenia, bipolar disorders, major depressive disorders, and generalized anxiety disorders can have their symptoms well managed enough for them to have a functional life and contribute to society.

Cost and disease Burden

Let me turn to cost and disease burden. As we all should know by now, psychiatric conditions account for about 35% of the global disease burden. This is because psychiatric disorders cause relatively more morbidity than mortality except in the case of suicide and premature death from medical illnesses. Cardiovascular conditions account for 33% of global disease burden and in the year 2010 the cost from lack of productivity globally for cardiovascular conditions was \$863 million. However, the cost in the same year for psychiatric disorders was \$2.5 trillion dollars in lost productivity. In 2030, the estimated cost in lost productivity for cardiovascular disorders will be \$1.04 trillion globally compared to \$6 trillion globally for psychiatric disorders. I don't think there is any doubt that a strong preventative approach with early case finding and rigorous treatments will go a long way to prevent the escalation of cost over time^{9, 10}.

Where do people go when they begin to have their first symptoms of a psychiatric disorder? In many situations they go to their primary care physician or other health care provider at the district or regional level. They also speak to family elders, pastors or if their symptoms are flagrant enough they may be sent to a prayer camp where they will lose all their basic human rights, will be chained and will not be provided with any evidence based treatment. While spirituality is important component of good health, it is not an alternative to recognized treatment options.

In the primary care context it is now acknowledged that about 15% of patients see a primary care provider primarily for a psychiatric reason and 50% have a significant psychiatric problem accompanying the presenting complaint in the primary care setting. The WHO estimates that 25% of all patients using a health service suffer from at least one mental, neurological or behavioral disorder, most of which are undiagnosed or untreated.

Psychiatry therefore is a significant primary care concern. As a medical educator it strikes me that knowing this, the curriculum in undergraduate medicine should reflect this reality and equip graduates with knowledge and diagnostic skills to recognize common psychiatric conditions in the primary care setting. These would be conditions like major depressive disorder, early schizophrenia, anxiety disorders, and substance abuse disorders and for

children, attention deficit hyperactivity disorder and autism spectrum disorder.

In addition to the presentation of psychiatric symptoms in a primary care setting there are numerous medical illnesses that present first with psychiatric symptoms and our practitioners need to be well aware of these. The presence of a psychiatric illness that is untreated tends to worsen medical morbidity and disability. Medical mortality rates are worsened by untreated psychiatric illnesses. We know that patients with severe and persistent mental illnesses have a mortality that reduces their lifespans by 25%¹¹. The mind and the body clearly are separated in our own minds but that is certainly not the human experience.

Role of Mental Health Authority

It is our expectation that the newborn Mental Health Authority will likely develop a vigorous public mental health education approach since we all know that the behavioral factors account for up to 50% of the social determinants of health. We must have continued education for practitioners like ourselves because we must start the de-stigmatization process within our own professional community.

Teaching and curriculum development

The teaching of psychiatry in medical schools should be more rigorous because most non psychiatric physicians will end up treating many patients with psychiatric disorders in the ambulatory setting and must do so guided by the best scientific evidence. At the University of Cape Coast School Of Medical Sciences (UCCSMS) where I teach regularly, we have a curriculum in psychiatry that is more than 10 weeks in duration. The average length of psychiatric rotation worldwide is 5.5 weeks¹². In a developing country like ours, we have to invest more in improving the psychiatric management skills of the generalists because they will be required to do more than those in developed countries. We also have to consider other educational interventions. I believe for example that offering an additional year of training to family physicians in behavioral health and psychiatry would be a worthwhile investment as is available at the College of Community Health Sciences at the University of Alabama where our department instituted such a program in 2007. There are also examples of primary care residency programs that are only a year longer that combine psychiatry with internal medicine, family medicine or neurology. This approach will help increase the number of primary care and other specialists with skills to address the needs of many patients currently do not benefit from proper psychiatric evaluations and evidence-based treatment interventions.

Professional education and practice

Overall, we must increase our emphasis on inter-professional education and practice and recognize the

role that non physician healthcare providers can play in providing better mental healthcare across the population. Every health unit must have a mental health physician extender present from the district level up. Psychiatrically informed physicians will be effective leaders in educating the general public through patient care and community speaking opportunities on prevention and treatment of psychiatric disorders. As I mentioned earlier, a strategy for prevention of psychiatric disorders centered on our educational infrastructure will have a sustainable impact on the population, reduce costs, decrease lost productivity and promote overall health and wellness. Every school must have a well-trained mental health professional to lead the prevention effort and liaise with the health care system.

Law enforcement

Law enforcement and judicial officials also need formal training in mental health, as many patients come into contact with the legal system and often face inappropriate outcomes with loss of their constitutional protections. One other area that time does not allow me to address is workplace mental health and the additional loss of productivity from presenteeism when compared to worker absenteeism¹³.

Currently, I believe the new Mental Health Law in Ghana will provide a basis for the implementation of some of the ideas that I have shared with you today but, I would be remiss in not mentioning technology as a tool that we have grossly underused. It presents a missed opportunity for both education of trainees and the treatment for psychiatric disorders in Ghana. There is no reason why we cannot develop a telehealth network which would allow primary care physicians wherever they are to have access to specialists in Ghana and even outside Ghana, to consult with them on patients they manage every day¹⁴.

Conclusion

In conclusion I would like to return to the brain, the organ at the center of these disorders. I wish to highlight the plasticity of the brain. Just as it has strong biological underpinnings, it is also very much an organ that is shaped by the environment in which it lives. Advances in neuroscience research have led to a more sophisticated understanding of how psychotherapy may affect brain functioning. Mental phenomena arise from the brain, but subjective experiences also affect the brain. While psychotherapy and other environmental inputs will not change the genes, they can affect the transcriptional functions of gene expression and as such, psychotherapy and other non-medical interventions can have a lasting positive impact on the brain. It is said that medication may target temperament and psychotherapy targets character.

Studies on the neuroscience of environmental impact on the brain remain preliminary but clearly there is a very large role for psychologists and other

mental health therapists, like clinical social workers in the treatment of psychiatric disorders on the basis of what we know about the plasticity of the brain and how it changes based on externally derived inputs. In the same way that trauma can affect the brain to cause post-traumatic stress disorder, psychotherapy can cause the brain to become resilient enough to reduce the risk of psychiatric disorders and to reduce the full expression of already present disorders.

Psychiatric disorders are extremely common. 1 in 4 persons will have a diagnosable psychiatric disorder in our lifetime and the disability engendered by major psychiatric disorders is significant. The degree of disability caused by MDD is thought to be equivalent to that of blindness or paraplegia. Schizophrenia is similarly estimated to cause a degree of disability consistent with quadriplegia. These are not insignificant conditions. The mind is at the core of who we are but we take good mental health for granted. We have a great task and responsibility to change our thinking about these brain conditions from what prevailed in the 17th century to the 21st century's integrated understanding of these conditions. I must however remind you that at the turn of the 20th century, Africans were well ahead of Europeans in psychopharmacology. In 1925, when a prominent Nigerian went psychotic in England, there were no effective treatments available. His traditional healer who arrived weeks later from Nigeria treated him effectively with *Rauwolfia* root. He had better medicine than any European or American Psychiatrist of that era¹⁵.

I have simply touched on a few areas in the time available to me but I would like to end by saying that in the last three or more decades that I have been in practice as a psychiatrist, every decade has come with better and more effective treatments for mental illnesses. We have a great opportunity to design effective prevention and treatment systems even with the limited resources we have by applying those resources within a different conceptual framework. Thank you very much for the opportunity of speaking to you this morning.

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TEACHING PROCEDURAL CLINICAL SKILLS TO HEALTH CARE PROFESSIONALS IN GHANA; THE NEED TO EMBRACE THE NEW PARADIGM SHIFT

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Summary

Health professionals training in procedural skills at the undergraduate and postgraduate levels remain a challenge. It has traditionally been based on the principles of “see one, do one and teach one”. This article highlights the usefulness of the Walker and Peyton’s four step framework for teaching procedural skills and the Pendleton’s rule for giving feedback. There is the need to embrace the new paradigm shift

with defined goals that allow for feedback by both trainee and trainer.

Trainers should review and adopt the best approach for teaching clinical skills, and the requirements for achieving skill mastery to ensure clients safety and ensure the training of competent clinicians for the future.

Key Words: Procedural clinical skills, Pendleton’s rule, Walker and Peyton and Teaching.

Background

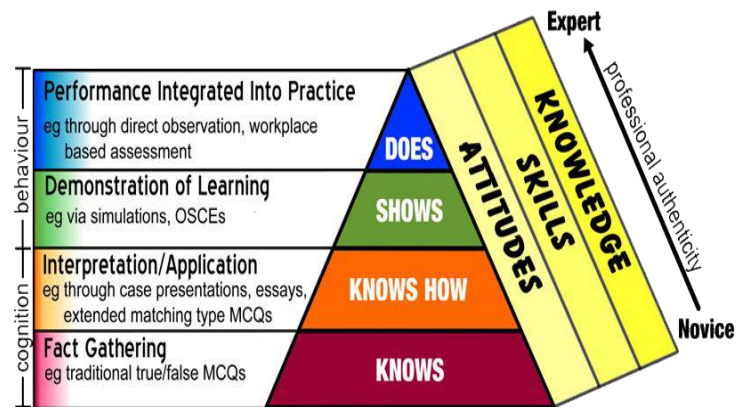
The teaching of psychomotor or procedural clinical skills to undergraduate and postgraduate health professionals remain a challenge. It has traditionally been based on the principles of “see one, do one and teach one”. During skills training the trainee is exposed to a wide spectrum of practical procedures over a period. This ranges from simple procedures such as a peripheral intravenous cannulation to a more complex one such as endoscopic retrograde cholangiopancreatography. There is the need to explore other means of teaching and evaluating practical skills beyond the traditional principle of “see one, do one, teach one”. Those with the responsibility of providing health services must first be aware and embrace the need to change or update their practices. There is a need to create the platform for health professionals to upgrade their knowledge, skills and attitude¹. This can be done through targeted in service training for those already practicing, or strengthened pre-service education. Effective education provides a balance of theoretical and practical experiences to enable learners develop competencies that are important for their entering a healthcare profession and continuing to develop professionally throughout their careers. The social, cultural, historical and political forces interplay to mould teaching and learning, and thus the essential competencies that learners must develop.

Principles of clinical skill teaching

The Miller’s pyramid² demonstrates the skill learning hierarchy (figure 1). It involves four levels of competency assessment which are trainee knows, knows how, shows and finally does. “KNOWS” essentially describes fact gathering and is assessed through essay writing and multiple choice questions. “KNOWS HOW” assesses the interpretation and application of the knowledge acquired. “SHOWS” deals with demonstration of learning through simulation and real life practical sessions. “DOES” Here trainee performs through direct observation and in some cases through workplace based assessment. The pyramid demonstrates the transition from a novice to an expert through knowledge acquisition and the development of the right skills and attitude.

MILLER’S PRISM OF CLINICAL COMPETENCE (aka Miller's Pyramid)

it is only in the “does” triangle that the doctor truly performs



Based on work by Miller GE. The Assessment of Clinical Skills/Competence/Performance; Acad. Med. 1990; 65(9): 63-67
Adapted by Drs. R. Mehay & R. Burns, UK (Jan 2009)

Fig 1. Miller’s Prism of clinical competence

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In the field of education, research has demonstrated that learners require an appropriate environment and a variety of learning activities that include opportunities to practice and receive feedback on their performance⁵.

The trainer must have the requisite knowledge, skills and attitude to move a novice from the level of unconscious incompetence (baseline awareness) to the level of unconscious competence (Mastery). From the learning cycle an individual may start from any of the levels of psychomotor skills. The individual at unconscious incompetence stage is usually unaware of the procedure and therefore cannot tell his level of competence regarding the clinical skill in question. Following awareness or exposure to the skill, the learner then moves to the conscious incompetence stage where he or she becomes aware of his inadequacy at performing that skill. Following competency based learning i.e. learning by doing one moves to the conscious competence phase where thinking, attention and staying focused is required to complete a task. At this phase the trainee requires a full attention with no distraction if not a lot of errors or complications will result. As the performance of this skill is done repeatedly the trainee now acquires mastery and is now said to be at the unconscious competence level. At this level the trainee is described as an expert or a master of that particular skill.

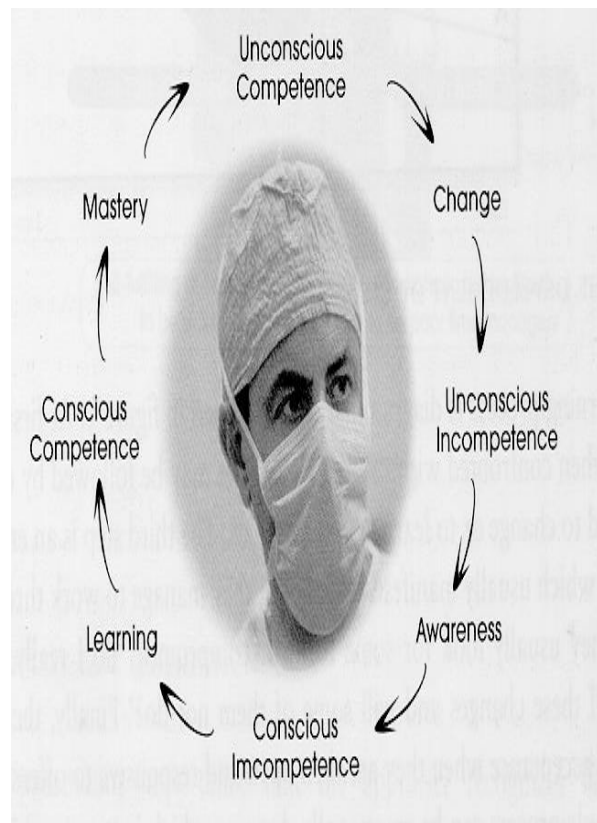


Fig 2. The learning Cycle

In teaching clinical procedural skills, one is required to understand key principles that inform teaching and learning of these skills. It is the responsibility of the trainer to assist the trainee to appreciate the various components of a particular skill. The trainee should also develop understanding of the various elements which include;

- Conceptualization – where skill fits and why important
- Visualization - seeing the skill
- Verbalization – talking the skill
- Physical practice - doing the skill
- Correction and reinforcement - feedback on the skill

A high level of competence at performing a particular skill is required for one to be considered a trainer of psychomotor or procedural skills. Training must be done such that it provides a balanced feedback within a structured approach, assess the proficiency of the learner and ensure that there is a gradual decline to the extent of supervision which allows the trainee to feel that they are supported fully and trusted to perform the skill as an autonomous practitioner. Doheny showed that those trainers who combine the opportunities for their trainees to mentally rehearse the skill with opportunities for the physical practice of each new skill can increase the accuracy with which the procedure is conducted significantly quicker than physical practice alone (Doheny 1993)⁵.

Trainer challenges

It is often a challenge for a trainer who has been routinely performing a complex procedure usually in the “auto pilot” mode to assume the role of a trainer. The expert operating at the level of unconscious competence must deconstruct the procedure to its various stages and elements required for a competent final execution of the skill that is the expert becoming consciously competent. In the same way the novice is unaware of the task to be performed and it is the responsibility of the trainer to bring to the fore this awareness. Here the trainee is brought to the level of conscious incompetence and this primarily helps the trainer to protect clients and define the learning objectives for the trainee.

One of the challenges faced by trainers is the readiness or otherwise of trainees to carry out more advanced procedures on clients at the hospital setting. Grantcharov and Reznick (2008) proposed pre-patient training i.e. use of manikins and simulated patient consultations as a solution which can be adapted in a modified form for our setting⁴. Simulation for skills training in health care education has been evolving at an accelerating rate (Khan et al., 2011). This development has permitted the introduction of new methods of skills training besides the traditional ways. In settings where virtual reality simulators are used, the students can make mistakes without harming anyone

(Baxter et al., 2009), and the training enables learning to take place in a safe, non-threatening environment^{7, 8}

Traditional approach to clinical skills training

Many procedures are still thought on the principles of “see one, do one and teach one “. The extent to which this principle is impacting the level of competence in psychomotor or procedural skills training amongst trainees in Ghana is not known. This procedure stills allows the expert to operate at the level of unconscious competence which makes teaching and learning very subjective. There are no predefined objectives for the training and no structured feedback pathways for both trainee and the trainer. It will be very useful in our environment to adopt the four-step structured model for clinical skill teaching which allows for effective feedback and evaluation.

The 4 step model for teaching clinical procedural skills

The traditional approach has become less useful in current medical procedural skills teaching. It is difficult for the “unconsciously competent” to relate to the novice. Walker and Peyton⁹ and Lake and Harndorf's¹⁰ four step framework for teaching procedural skills is helpful.

Step 1. Real life demonstration

The trainer demonstrates the skill in its entirety in real time and without commentary. This serves as a model of the finished product which allows trainees to observe the mastery of the skill.

Step 2. Deconstruction (Trainer talk through)

Here the trainer breaks the procedure into discrete steps. This stage shows how a complex process is made up of simple steps. The trainer repeats the procedure whilst explaining each step and manoeuvre, answering trainee questions or clarifying any points.

Step 3. Learner comprehension (Learner talk through)

The trainee directs the trainer, providing instructions to the trainer on each step and manoeuvre and the trainer does the skill. Trainee must be able to describe the steps correctly before he or she attempts the procedure

Step 4. Learner performs

The trainee does the skill under close supervision, articulating the key steps before doing them. Feedback is vital at this stage.

Subsequently, the learner practices under varying levels of supervision, with appropriate feedback, until they have reached a desired level of skill to perform independently.

Considering the use of this four step model will be beneficial to the teaching of clinical skills at all levels of health professionals education in Ghana. It must also be noted that this rigid approach may not be feasible for all procedural skills and appropriate modification to get the best benefit should be done.

Finally it must be noted that learning the correct technique is only part of competence and therefore effort must be made to ensure that the trainee knows the following;

- Indications
- Contraindications
- Complications and their management
- Follow up requirements

The role of feedback and evaluation in clinical procedural skill training

Feedback is the information given to a trainee or trainer but more commonly to a trainee about their performance. This can be intrinsic when there is a sense of a job well done, or perhaps one that could have been done better. The extrinsic feedback is the one that is provided by the supervisor or peer. It is important that feedback be as constructive as possible so it acts as motivation to drive the learning process. For adult learning, one of the key issues in giving constructive feedback is enabling the learner to reflect. There is the need for a well organised system of giving feedback to all trainees during their medical training.

The Pendleton's rule for giving feedback⁹ and evaluation is a very good tool that needs to be incorporated in our skill training programmes in Ghana. It has a clearly defined set of questions that allows for reproducibility in terms of same feedback and evaluation for trainees in our institutions. The difficulties we all experience in giving feedback relate to our need not to destroy the other person. We often avoid areas that could be contentious or seem overcritical. Unfortunately, this often leads to a kind of cosiness, where feedback is restricted to broad comments on the skill performed without clearly dissecting and potentially improving on the skills demonstrated. The most important part of feedback is offering an alternative to the skill or task being analysed. In this way the giver of feedback is also open to criticism by the receiver, and dialogue can then begin about the skills or attitudes in question.

Pendelton's rule for giving feedback^{9, 10}

- Firstly the trainee performing a skill says what went well and how.
- The observer (trainer or other trainees) depending on the setting, say what went well and how.
- The trainee then says what could have been done differently and how
- The observers than add what could have been done differently and how
- The pair or group then agree on areas for improvement.

Feedback in general should be considered as a normal teacher –student interaction. It should state clearly the criteria for performance assessment, giving feedback on specific behaviours rather than on general performance¹². It is usually preferred that feedback is

given on what was directly observed and in non-judgemental manner. It is more beneficial if given at the time of an event or shortly after so one can have a good reflection rather than at a later time where there is recall challenges. Feedback should ultimately lead to changes in the learner's thinking, behavior and performance^{13,14}.

Conclusion

Education is known to be more effective when expected outcomes build on existing knowledge, skills, and attitudes, are relevant to the future tasks of the healthcare provider, correspond to the health needs of a society, and are supported by policies and practices in governments and at healthcare facilities. All health professionals in Ghana have an important role to perform in terms of an agreement on the standards for training in clinical procedural skills. We need to provide opportunities for the trainee to practice just as we need to have regular critical scrutiny of performance coupled with constructive feedback. Teaching procedural skills is a routine role of many teachers in the health care system in every country. It is important that trainers review and adopt the best approach for teaching skills, and the requirements for achieving skill mastery. We recommend the adoption of the Walker and Peyton's four step approach and the Pendleton's rule for giving feedback to ensure clients safety and ensure the training of competent clinicians for the future.

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UNIVERSITY OF GHANA MEDICAL SCHOOL



Sir Frederick Gordon Guggisberg



First Medical School Building
(Basics Sciences Building)



Dr. Kwame Nkrumah

In 1891 Governor Sir Brandford Griffith proposed training of doctors at the Accra Hospital. Also in 1913 Governor Hugh Clifford also made a similar proposal .

The most serious attempt was made by Sir Frederick Gordon Guggisberg, Governor of Gold Coast from 1919 to 1927.

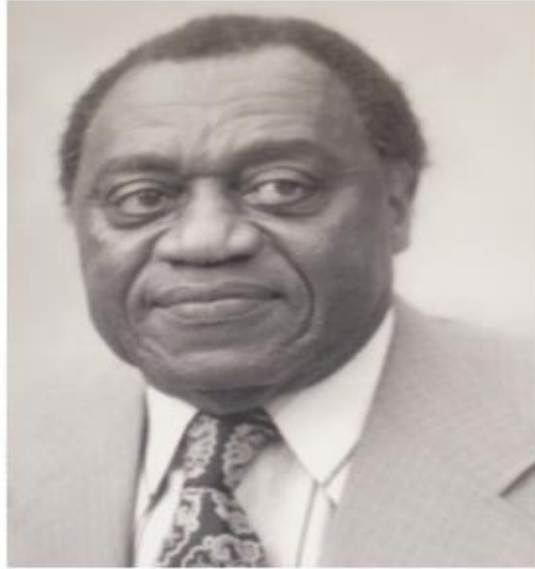
He planned to set up a medical school centred around Gold Coast hospital (Korle-Bu hospital).The prospect was scuppered by 1928 partly because Guggisberg left Gold Coast in 1927.

In 1962 President Nkrumah decided that Ghana should, on its own, establish a medical school. That year, 59 students were enrolled to commence pre medical courses at the University of Ghana.

The basic sciences building was the first structure built for the medical school and is situated where Governor Guggisberg had planned to establish the medical school in Korle Bu. Four (4) Tower blocks were built to house the Departments of Medicine, Paediatrics, Obstetrics and Gynaecology and Surgery to complement the Wards built by Guggisberg.

FIRST GHANAIAN SURGEON—DR. C. O. EASMON

(GRANDSON OF DR. J. F. EASMON)



1st Ghanaian Surgeon

1st Dean of Ghana Medical School

1st President of Ghana Medical Association (GMA)

1st Chairman of Medical and Dental Council (MDC)



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The Primary, Membership and Fellowship examinations of all Faculties of the College are scheduled as follows:

Written Papers

Date: Monday, 20th & Tuesday, 21st March 2017
Time: 9.00 am
Venue: Ghana College of Physicians and Surgeons, 54, Independence Avenue, Ridge, Accra.

Oral, Clinical and Practical Examinations

Date: Tuesday, 21st & Wednesday, 22nd March 2017
Time: 9.00am each day
Venue: Korle-Bu Teaching Hospital, Korle-Bu, Accra/
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NOTE

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GHANA COLLEGE OF PHYSICIANS & SURGEONS

FACULTY OF FAMILY MEDICINE

In collaboration with

**SOCIETY OF FAMILY PHYSICIANS OF GHANA
(SOFPOG)**

PRESENTS A PRE CONFERENCE WORKSHOP ON

HEALTHCARE FINANCING AT THE PRIMARY CARE LEVEL

Dates: Monday 21st & Tuesday 22nd November 2016

Time: 8.30am - 5.00pm each day

Venue: The College, 54 Independence Avenue, Ridge, Accra

TOPICS

- Modes of Delivery of Primary Health Care in Ghana.
- Current Ways of Financing Primary Health Care in Ghana.
- NHIS Reimbursements at the levels of Care - Public Sector, Private Sector and NHIS Perspectives.
- Financing Primary Care - The Role of Private Health Insurance Companies.
- Resourcing Primary Health Care Delivery in Ghana: Human Resources, Infrastructure and Equipment.
- Overview of the Family Medicine Modular Membership Programme.
- Family Medicine Training: Trainer's and Trainee's Perspective.

REGISTRATION FEE FOR ALL PARTICIPANTS: GHS 150.00

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**CERTIFICATE WILL BE GIVEN AT THE END OF THE COURSE TO PARTICIPANTS / MDC
CREDIT POINTS WILL BE AWARDED**

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FACULTY OF INTERNAL MEDICINE

PRESENTS A PRE CONFERENCE WORKSHOP ON

STATUS EPILEPTICUS

Date: Monday 21st November, 2016

Time: 1.00 pm to 5.00 pm

Venue: Ghana College of Physicians & Surgeons, 54 Independence Avenue, Ridge Accra

TOPICS:

- . Definition, Pathophysiology of Status Epilepticus.
- . Features of Status Epilepticus.
- . Clinical Features of Status Epilepticus.
- . Causes of Status Epilepticus.
- . Drug Treatment of Status Epilepticus.
- . Anaesthetics/Other therapies used in Status Epilepticus.

Registration Fee for All Participants: - GH ₵50.00

This course is suitable for all Medical Professionals especially Residents in Internal Medicine, Family Physicians, Physician Assistants, Private Practitioners, Members and Fellows of the College.

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FACULTY OF OBSTETRICS & GYNAECOLOGY

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OBSTETRIC EMERGENCIES

(PREECLAMPSIA, ECLAMPSIA & THROMBO-
EMBOLISM IN PREGNANCY)

Date: Monday 21st November, 2016.

Time: 9.00 am to 5.00 pm .

Venue: GCPS, 54 Independence Avenue, Ridge Accra.

TOPICS:

- Current Issues in the Aetiology and Prediction of Gestational Hypertension, Preeclampsia and Eclampsia..
- Management of Severe Preeclampsia/Eclampsia.
- Management of the Complications of Preeclampsia/Eclampsia
- Overview of Thrombo-Embolicism.
- Thrombo-Embolicism in Obstetric Practice; Risk Factors Prevention and Management.

Registration Fee for All Participants:- GH ₵100.00

This course is suitable for all Medical Professionals especially Obstetrics & Gynaecologist, Family Physicians, Anaesthetist, General Surgeons, Residents, Members and Fellows of the College.

CERTIFICATE WILL BE GIVEN AT THE END OF THE COURSE TO PARTICIPANTS / MDC CREDIT POINTS WILL BE AWARDED

Call 0302-238703, 238650, 0243690073 personally at The College, 54 Independence Avenue, Ridge, Accra for registration or further enquiries.



GHANA COLLEGE OF PHYSICIANS & SURGEONS

FACULTY OF PUBLIC HEALTH

PRESENTS A PRE-CONFERENCE WORKSHOP ON

ADVANCES IN PUBLIC HEALTH

Date: Monday, 21st November 2016

Time: 9.00 am to 3.00 pm

Venue: Ghana College of Physicians and Surgeons, 54 Independence Avenue. Ridge, Accra

TOPICS:

- . A Cross Sectional Study to Demonstrate the Role of a Public Health Physician in Sport.**
- . Maternal Death Audit Review in a Regional Hospital in Ghana. Quality of Care Received and Factors Leading to Maternal Deaths**
- . Ghana Malaria Vaccine Technical Brief**

Registration Fee For All Participants: GHS 100

This seminar is suitable for all Medical Professional, especially Public Health Physicians, Family Physicians, Residents, Members and Fellows.

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The order of the text should be as follows: **title page, abstract** (structured) of no more than 250 words with 2-8 key words (MeSH terms) at the bottom. The main text must be divided into the following sections: **introduction, subjects (or materials) and methods, results, discussion, conclusion, acknowledgements, references, tables, legends to figures and figures**. Each section should begin on a new page and all pages must be numbered consecutively, beginning with the title page

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EXAMPLES

Article

McLendon WW. A historical perspective as a compass for the future of Pathology. Arch Pathol Lab Med 1986; 110: 284-288.

Book

Talbot CH. Medicine in Medieval England. Oldbourne, London. 1926 p 120-136.

Book Chapter

Phillips SJ, Whisnau JP. Hypertension and stroke. In: Laragh JH, Brenner BM, editors, Hypertension: pathophysiology, diagnosis and management. 2nd Ed. New York: Raven Press, 1995, p465-478.

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