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The Challenges of Training Undergraduate Clinical Surgical Students: A Study experience after Six Years in The New School of Medicine in Ndola, Zambia.

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ABSTRACT

The training of Medical students is always a challenge. Our students have to pass through the school of medicine for a period of five years in which they have tests, assignments and ends of terms and years examinations. We have learned from what Hafferty F.W wrote and proposed that the medical school should be best thought of as a 'learning environment' and that reform initiatives must be undertaken with an eye to what students learn instead of what they are taught[1]. We have learned a lot from our students as we have gone through six years when the school was opened. It has been said that innovative approaches to teaching, progressive skills instruction, assessment and examination and support of the development of professionalism, require us as teachers should have the time to observe, instruct, coach, and assess our students and we should also have time for self-reflection and our own professional development[6].These have been our responsibility. But have we acquired these standards?

Key words: Changing, Learning, Medicine, Students, Teaching, Zambia .

INTRODUCTION

Our students started their medical training at the Ndola school of medicine based on the Copper belt School of medicine. They were part of the First CBU based Medical school after a lot of Political and national pressure to open the school of Medicine. The School of Medicine on the Copper belt was started in October 2011.To get the students we selected the students from the CBU after the students had spent one or two years in that University based in Kitwe, Zambia. The best of the best of the students from CBU, the best of all students who did a two year study of A Levels in Zambia or abroad, the Best Diploma holders of those who did a dental course done in Lusaka and indeed all who were degree holders of a science were selected.

Our students have to pass through the school of medicine for a period of five years in which they have tests, assignments and ends of terms and years examinations. After five years in the School of Medicine at the Ndola Teaching Hospital ; the first students graduated on 29th September 2016.The second students have reached their end of five years of study in the August of 2017

As we faced challenges in our school of medicine we read what Hafferty F.W wrote and said the following " Throughout this century there have been many efforts to reform the medical curriculum. These efforts have largely been unsuccessful in producing fundamental changes in the training of medical students". He went on to propose that the medical school should be best thought of as a 'learning environment' and that reform initiatives must be undertaken with an eye to what students learn instead of what they are taught[1].We have come to appreciate that most schools including us have the following experiences in that they have the formal curriculum, the informal curriculum, and the hidden curriculum. Haffert requests that the hidden curriculum needs particular exploration. We have tried our best to expose and explore all the forms of our form of curricullae.

The other issue about medical education is the demand to use the international Email to learn. Many Schools have applied this exploring i.e., innovative thinking and approaches to the new learning technologies including e-learning and virtual reality. R M Harden and IR Hart propose and suggest the "new approaches to curriculum planning and mapping and advanced instructional design based on the use of 'reusable learning objects'; an international perspective on medical education which takes into account the trend to globalization; a flexible curriculum which meets the needs of different students and has the potential of increasing access to medicine" [2] Ruiz, Jorge G et al go on to say what this means is that" E-learning is the use of Internet technologies to enhance knowledge and performance. E-learning technologies offer learners control over content, learning sequence, pace of learning, time, and often media, allowing them to tailor their experiences to meet their personal learning objectives" In diverse medical education contexts, e-learning appears to be at least as effective as traditional instructor-led methods such as lectures. Students do not see e-learning as replacing traditional instructor-led training but as a complement to it, forming part of a blended-learning strategy [3].This led us to also be great e learners.

Despite these great things about how a hospital trains medical students there are challenges. The Americans admit the reality that they have a major challenge facing medical education in the United States. It is the erosion of the clinical environment, the loss of clinical revenues and all its attendant consequences, including pressures for increased faculty productivity in an environment that is increasingly managed[4]. This sounds very similar to what we in Zambia are going through. In fact much earlier in America, one hundred years ago, Flexner's critique of medical education converted an evolutionary change already under way in North American medical education into a revolution. Molly Cooke et al go on to say the following "A final problem is the financing of medical education. Good teaching, whether it is conducted in the classroom, clinic, or hospital, requires money but also time". They go on to say that Innovative approaches to teaching, progressive skills instruction, multitiered assessment, and support of the development of professionalism all require teachers who have the time to observe, instruct, coach, and assess their students and who also have time for self-reflection and their own professional development[6].That statement of 'self-reflection and our own professional development' is a must we involved in training undergraduate clinical surgical students must apply to ourselves from time to time. Despite all these issues, much is developing in medical education throughout the world.

The Indian medical education system, one of the largest in the world, produces many physicians who emigrate to the United States, the United Kingdom, and several other countries. They have rapidly proliferated in India and in the past 25 years they have doubled since 1980 for a current total of 258 Medical schools[5]. The Saudi Arabs have also had a great change, for them, the Medical education has been changing rapidly in. Within a decade, the number of medical colleges increased from 5 medical schools with traditional disciplined-based curricula

to 21 medical colleges with varied curricula ranging from the traditional to more innovative, problem-based, community oriented programmes[8]. In fact the private sector has started investing in higher education generally and medical education in particular. If one thinks about this, they will remember that in Zambia there was one medical school for over 45 years and in the last five years we have more than six medical schools. Three GRZ medical schools and three or more Private medical schools. We are also proliferating. One obvious issue in India is that Curriculum reform has been advocated for over 30 years, with calls for greater relevance of the curriculum to the needs of the community and the Revised guidelines from the Medical council of India(MCI) in 1997supported these changes[5]. It won't take long before our Health Professionals Council Of Zambia (HPCZ)will order a look at our School of medicine in Zambia for a total change. We need to be ahead of HPCZ mind on medical curricula all the time.

In India they have noted that the training of medical students does not only end at the end of medical training, unfortunately the problems follow the students into the internship they go through. The internship year focusing on rotating clinical experiences, under the control of medical schools in India, has suffered from lack of supervision and minimal assessment; it is often used predominantly as a time to study for residency entrance examinations. We also accept that the control of interns is not fully there and interns are driven by personal experience some come out as great Doctors others are just by passers. Hence even at end of the graduated students,we must think of how best we can make it better.

When one looks on the issues of medical training/education of students, there is lot in publications. What comes out is that the Medical education is currently a hot topic. More and more people want to be involved in developing new educational and assessment methods and in conducting research in medical education. These developments have an increasing influence on the work of everybody in health care[7]. Lambert WT Schuwith et al point out that many of the developments and research in medical education have focused on the undergraduate curriculum, especially the theoretical parts. Sadly, Clinical attachments and postgraduate training have not received nearly as much attention. When we looked at our Post grade situation we could see the truth written above. We will find out a lot we have not fully done for them in form of Post graduate e-learning and their curriculum.

What our major problem is in training our medical students is what Paul Bradley states and it is that at the present time the quantity and quality of research in this area of medical education is limited[9]. Research is needed to enable educators to justify the cost and effort involved in education of medical students. How do they achieve this? It is suggested that each medical school must determine its own educational aim, analyse the context in which it operates, identify the factors that constrain its operation, and choose the curricular model and teaching and learning methods that suit it best[10].

OUR CHALLENGES

We have a large number of problems and challenges we have to go through . We have selected three current issues that need our attention as soon as possible.

Firstly, the numbers of students we are training are getting larger as the number years of the medical school develops; in the first year we had 80 students, those who came in the second year were over 60, the third year in coming were 140. Those who came in the fourth medical year development the number had increased and we had 180 and the latest student are 312 have spent their first year in the school of medicine. Naturally when the students reached their Clinical education the hospital found itself with a large number of medical students to be trained. In addition, the Ndola Teaching hospital has three Nursing schools who come to the

hospital for their training. There are also Biomedical colleges training Laboratory students. The Challenge of training students is a threatening problem. There are too many students in the Hospital.

This has immediately led to a very hard issue it is the marking of examinations. In Zambia clinical training of Medical students leads to examinations that must be marked. Marking has become a challenge.

Secondly; in training of undergraduate clinical surgical students there is a need to train them as much as we can to give them all the knowledge they need. Clinical simulation is on the point of having a significant impact on health care education but our professional boundaries are far below for the following reasons: We do not have enough money to get Simulators. Secondly we know that the surgery they need to learn is wide and large; new books have developed, in addition, new modes of investigations and research have come up. The Challenge is how much teaching can we acquire, how can we provide the best knowledge to our students?

Thirdly. We have two cases. Firstly, the availability of patients through whom the students go through in clinical study and particularly in the tests and examinations are available but may not allow all the large number of students examine them touch them or come and see them. The patients often become resistant or uncooperative.

Secondly, the standard major clinical case and minor clinical case the students go through may results in such a way that one student goes through a complicated and difficult case while the other student may have an easy case and as a result complaints and appeals come out.

As the new school started we have had to attend to these issues.

Figure 1. The Ndola Teaching Hospital

OUR EXPERIENCE

Issue number one

1. The Ndola Teaching Hospital has a bed number status of 800 patients beds capacity. ADH the Pediatric hospital legally has 200 patients bed capacity. The patient bed capacity to medical student's capacity are not officially known. Clinically the ward rounds became and were crowded. Some patients began feeling put off by the large number of medical students.

   We tried to develop the referring of our students to other Copperbelt Hospitals namely the Luanshya mine hospital, the Wusikili Mine Hospital in Kitwe, The Mufulira Mine hospital in Mufulira, the Konkola copper Mine hospitals in Chingola and Chililabomwe. Above all the Kitwe Central Hospital. The Memorandum of Understanding (MoU) was ear marked, so many speeches talks and discussions were carried out but up to now they were not effective.

   The one in Chingola was very special; an agreement was arranged the students were to spend some clinical learning in Chingola. A new problem came up on who was to provide accommodation in Chingola. The Chingola house owners wanted the Copper Belt University to pay for the accommodation and the CBU would get the money from the students. But CBU refused to get involved. So the matter became a non progressive issue.

Up to now we have a rapidly growing Medical school but the MuO to the Hospitals around the Copperbelt has no effect and Ndola Teaching hospital plus the ADH Pediatric hospital are currently being overrun by the large number of medical students.

2. In Zambia clinical training of Medical students leads to examinations that must be marked. If one had, say about 100 students, one could set up a Paper one exam mainly of MCQ, and a paper two exam comprised of written long essays and short answers. These are usually hand written. The total number of marked exams will be 200.The numbers have gone up have gone up now . We suddenly found ourselves with over 300 new medical students. Marking these students meant that every term marking paper one and paper two exams led to marking 600 exam papers. These were not the only students there were students in other levels all of them needed marking. On the other hand there were not that many Clinical lectures to train and educate as year, besides marking hand written exams were a horror to mark, the hand writing of some students is very difficult to read it. We would be happy to organize this marking and change it to a computerized exam.
3. The theatres were critical about the numbers who could go in theatre. It was not good to have so many students. There were complaints about the number of students entering the theatres and there is presently no actual decisions on what we need to do to control this situation. One we are really hoping to do is to acquire TV cameras so that students would be in one Lecture theatre area and watch the theatre operations.

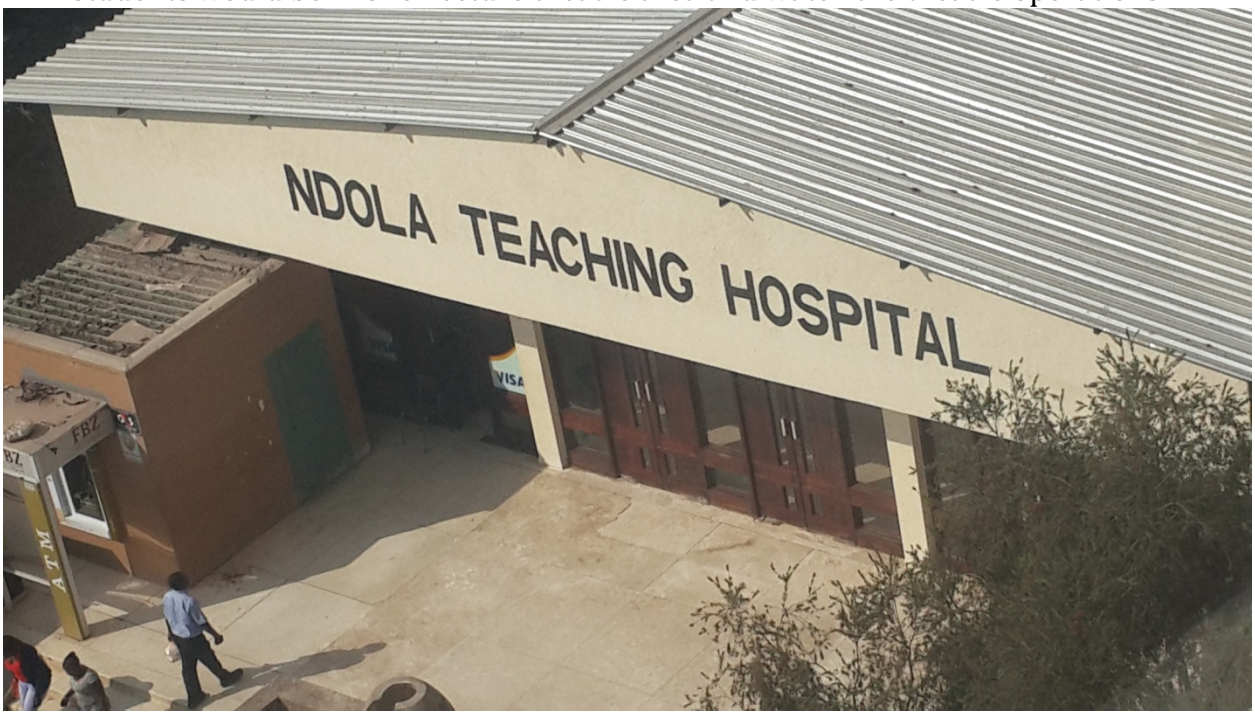


Figure 2 . Zambians entering the Ndola Teaching Hospital

Issue number two

The effects of our problem-based learning(PBL) were heavily limited[11]. This system is highly effective and is of great use. The major limiting effect was the low number of Consultant Surgeons , and senior Registrars to organize these sessions and teach the students ; The shortage of these trainers makes the process teaching by PBL impossible. Secondly the amount of passing on the science of surgery to our students has become overwhelming. The amount of knowledge is so large we can never teach all of it .We were forced to select only what was critical knowledge which must be taught and the students have to read the other knowledge by e. mails and computers . This situation is what Paul Bradley states; it is that at the present time

the quantity and quality of research in this area of medical education is limited[9].We have this effect in a very real situation.

Figure 3. The New Michael Sata School of Medicine

Issue number Three

A. The fact that we have seen is that the availability of patients through whom the students go through in clinical study and particularly in the tests and examinations are available but may not allow all the large number of students to come and see them or touch them, and at the time of clinical tests students would come to examine the patients, . We have seen that patients often become resistant or uncooperative. During the examinations we tried by collecting a large number of patients so that we can change the patients . The main issue was that we could not acquire a large number of patients we needed

B. During the examination there is usually standard major clinical case and minor clinical case that the students go through. The results that may occur is such a way that one student goes through a complicated and difficult case while the other student may have an easy case and as a result complaints and appeals come up. So at a time of our first graduating Doctors the objective structured clinical examinations (OSCEs) was started. Not every lecturer accepted this OSCE .Infact there was resistance from the Teachers, but it was the School of medicine standard demand[12].

We started the system of the OSCEs examination at the Medical school of Medicine called the Michael Chilufya Sata . We prepared a set of clinical pictures and asked the students to answer the questions. The questions were set for all the students to answer them. We know that the OSCEs may be different from one medical school hospital to another, ours was set up in the system way below. Whatever the students complained about these questions, they went through the examinations equally. None could appeal for unfair exams.

Three sets of questions were set up by three examiners to prevent the feeling and complaints from the students that one examiner deliberately made them fail.

The questions were printed in Capital questions so that no student would complain that they could not read the question.

Figure 4. The Main Examination Lecture hall at which exams took place.

Figure 5 The examination OSCEs pictures and questions displayed.

Figure 6. The students writing the exams

Figure 7. The external and the local examiners present during the OSCEs

CLINICAL EXAMINATION

Set up by the General Surgeon

PLEASE NOTE:-

1. ANY FORM OF CHEATING IN THE EXAMINATION ATTRACTS SEVERE PENALTIES INCLUDING EXPULSION FROM THE UNIVERSITY
2. CAREFULLY READ THE INSTRUCTIONS BEFORE ANSWERING EACH QUESTION – BECAUSE INSTRUCTIONS MAY BE DIFFERENT FROM QUESTION TO QUESTION.
3. WRITE YOUR NAME, STUDENT IDENTIFICATION NUMBER AND DEGREE PROGRAMME ON EACH ANSWER SHEET

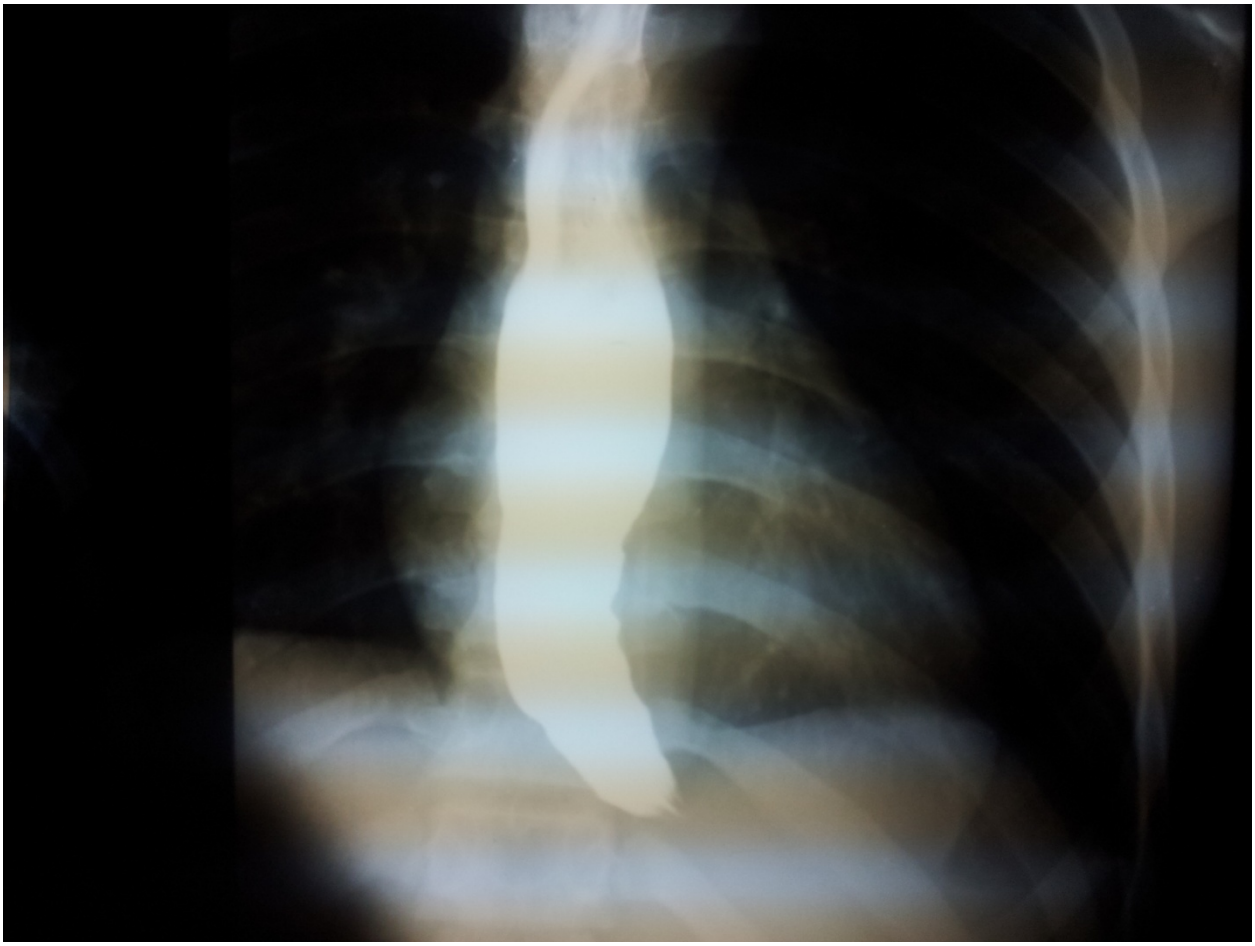
QUESTION 1

THE FOLLOWING SHOWS PERI-ANAL PATHOLOGY?

A. WHAT IS THE DIAGNOSIS?
B. WHAT SURGICAL TREATMENT MAY HELP THIS PATIENT?

2. THIS PATIENT HAS A PANCREATIC PSUEDOCYST

A. WHAT IS PANCREATIC PSUEDOCYST?
B. WHAT SURGERY CAN BE DONE FOR THIS PATIENT?



QUESTION 3

THIS CONDITION IS CALLED ACHALASIA OF THE CARDIA

A. EXPLAIN THE PATHOPHYSIOLOGY OF THIS CONDITION
B. WHAT SYMPTOMS DOES THIS PATIENT GO THROUGH?

QUESTION 4

THIS PATIENT WAS BROUGHT TO THE CASUALTY DEPARTMENT

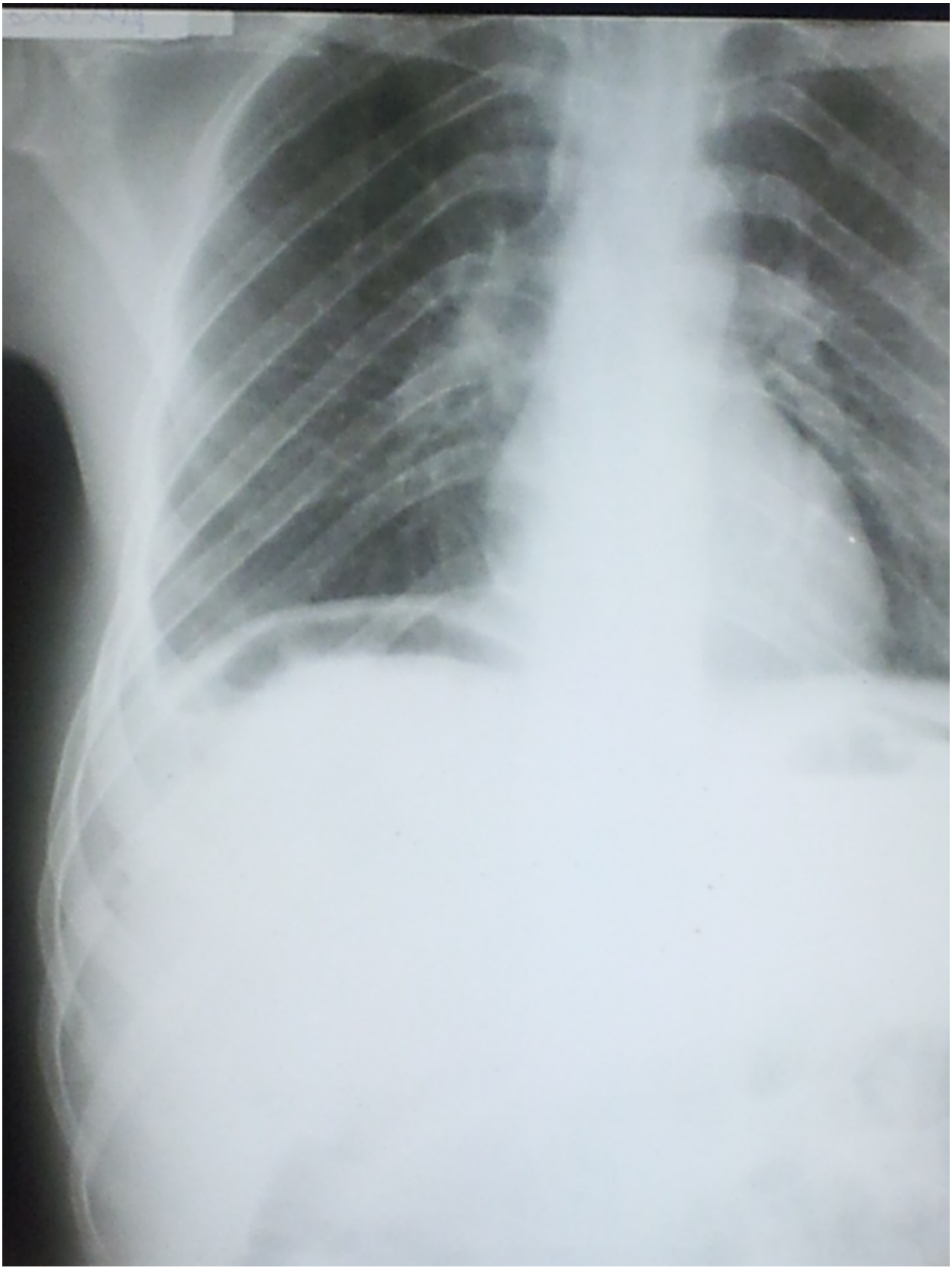
A. ON INSPECTION, WHAT IS THE MOST LIKELY DIAGNOSIS?
B. WHAT IS YOUR DIFFERENTIAL DIAGNOSIS. MENTION THREE

QUESTION 5.

TAKE A GOOD LOOK AT THE LEFT FOOT.

A. WHAT IS YOUR DIAGNOSIS?
B. WHAT ARE THE CAUSES OF THIS CONDITION? MENTION THREE.
C. MENTION THREE RISK FACTORS LIKELY IN THE HISTORY IN THIS MAN.

QUESTION 6.
THIS MAN HAD ABDOMINAL PAIN



A CHEST – RAY TAKEN ON HIM

A. WHAT IS THE MOST IMPORTANT FINDING ON THIS CHEST X-RAY PICTURE?
B. WHAT CONDITION, HAS CAUSED THIS CHEST X-RAY APPEARANCE?
C. NAME THREE CAUSES.

QUESTION 7.

THIS MAN HAS HANSEN'S DISEASE

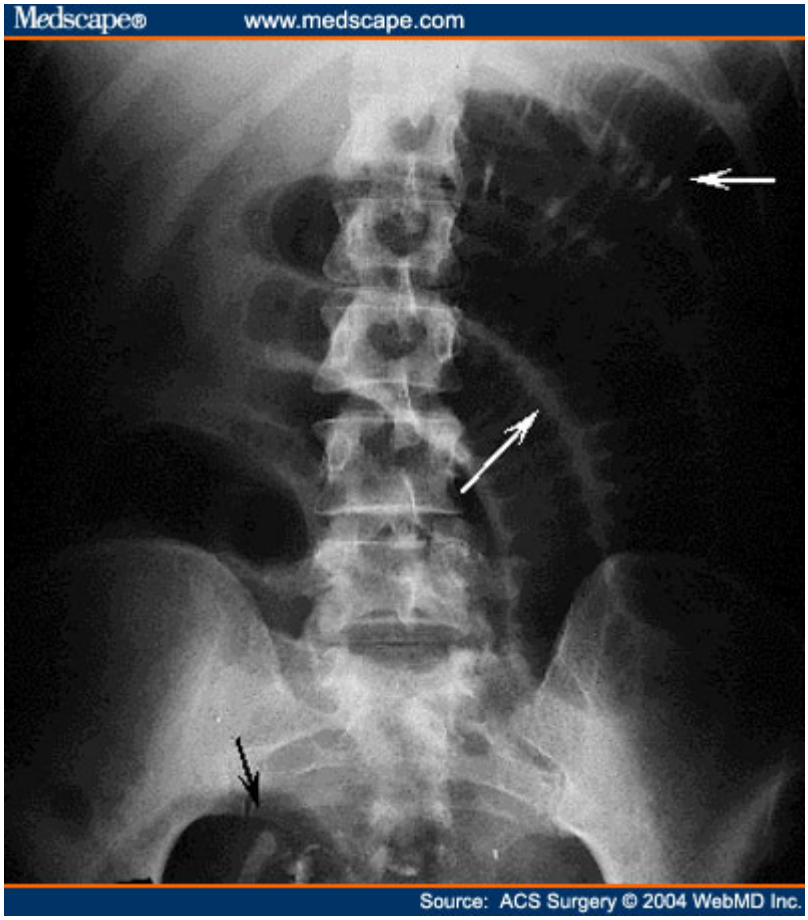
A. WHAT IS HANSENS'S DISEASE?
B. WHAT ARE FEATURES OF THIS CONDITION?
C. HOW DO YOU TREAT THIS CONDITION?

CLINICAL EXAMINATION

Questions set up by the second General Surgeon

PLEASE NOTE:-

4. ANY FORM OF CHEATING IN THE EXAMINATION ATTRACTS SEVERE PENALTIES INCLUDING EXPULSION FROM THE UNIVERSITY
5. CAREFULLY READ THE INSTRUCTIONS BEFORE ANSWERING EACH QUESTION – BECAUSE INSTRUCTIONS MAY BE DIFFERENT FROM QUESTION TO QUESTION.
6. WRITE YOUR NAME, STUDENT IDENTIFICATION NUMBER AND DEGREE PROGRAMME ON EACH ANSWER SHEET



1. WHAT IS THE DIAGNOSIS?
2. WHAT ARE THE LIKELY PRESENTING SYMPTOMS ?
3. WHAT ARE THE LIKELY FINDINGS ON INSPECTION, AUSCULTATION AND PALPATION?
4. WHAT THREE LINES DOES THIS PATIENT NEED?
5. WHAT IS THE DEFINITIVE TREATMENT**?**

1. APART FROM INJURY TO THE BLOOD VESSELS AND NERVES LIST FOUR PELVIC ORGANS THAT ARE LIKELY TO BE INJURED?
2. PELVIC FRACTURES MAY BE ASSOCIATED WITH HYPOVOLEMIC SHOCK. LIST THREE OTHER SITES IN THE BODY WHERE **ENOUGH BLOOD CAN** COLLECT TO CAUSE HYPOVOLEMIC SHOCK?

THIS LOCALLY ADVANCED BREAST CANCER.

1. LIST FIVE ORGANS THAT BREAST CANCER LIKES TO SPREAD TO.
2. LIST THREE RECEPTORS THAT YOU LIKE THE PATHOLOGIST TO LOOK OUT FOR.
3. LIST FIVE TREATMENT OPTIONS.

1. NAME TWO STRIKING FEATURES IN THIS PATIENT.
2. WHAT IS THE DIAGNOSIS?
3. WHAT IS THE MOST FEARED COMPLICATION OF SURGERY IN THIS PATIENT?
4. HOW WOULD YOU PREVENT THIS DREADED COMPLICATION?

1. WHAT IS THE MOST COMMON INDICATION OF LOWER LIMB AMPUTATIONS THAT ACCOUNTS FOR 65%OF CASES WORLDWIDE?
2. NAME THREE OTHER INDICATIONS FOR WHICH AMPUTATIONS ARE DONE?

1. NAME THREE BROAD CATEGORIES OF JAUNDICE AND GIVE AN EXAMPLE OF EACH CATEGORY?
2. WHAT IS SURGICAL JAUNDICE?

3. WHAT HISTORY IS HIGHLY SUGGESTIVE OF SURGICAL JAUNDICE?
4. WHAT URINE CHEMICAL TEST STRONGLY SUGGESTS SURGICAL JAUNDICE?
5. WHAT NON-INVASIVE TEST CONFIRMS SURGICAL JAUNDICE AND WHAT DOES IT SHOW?

LOOKING AFTER A DIABETIC PATIENT IS MORE THAN CONTROLLING BLOOD SUGAR BUT LOOKING OUT FOR TARGET ORGAN COMPLICATIONS. LIST FIVE TARGET ORGANS AND THEIR ASSOCIATED DIABETES INDUCED COMPLICATIONS**.**

This was a set of examinations. No students could feel he or she was being unfairly examined. The standard was the same for every one

DISCUSSION

Hafferty F.W wrote and said the following “Throughout this century there have been many efforts to reform the medical curriculum. These efforts have largely been unsuccessful in producing fundamental changes in the training of medical students”. He went on to propose that the medical school should be best thought of as a 'learning environment' and that reform initiatives must be undertaken with an eye to what students learn instead of what they are taught[1]. Our School of Medicine on the Copper belt was started in October 20 11. This is its sixth year of running this school of medicine. Our students have to pass through the school of medicine for a period of five years in which they have tests, assignments and ends of terms and years examinations. After five years in the School of Medicine at the Ndola Teaching Hospital ; the first students graduated on 29th September 2016.The second students have reached their end of five years of study in the August of 2017. Since this School of medicine started we have received a rapidly growing university From the start of 80 students now we have had a total of over 850 students ie 80 have graduated and 770 are in school. Essentially we are a rapidly developing school.

We ae smaller than the Indian medical education system, one of the largest in the world which produces many physicians who emigrate to the United States, the United Kingdom, and several other countries. The Zambian situation needs more Doctors to fit the WHO standard of one Doctor to look after 1000 people. However the practice right now is one Doctor is related to 12,00 Zambians. The Indian medicine have rapidly proliferated in India and in the past 25 years they have doubled since 1980 for a current total of 258 Medical schools[5]. So is the Zambian medical school development. It is also very similar to the Saudi Arabs Medical development. They also have had a great change, for them, the Medical education has been changing rapidly in. Within a decade, the number of medical colleges increased from 5 medical schools with traditional disciplined-based curricula to 21 medical colleges with varied curricula ranging from the traditional to more innovative, problem-based, community oriented programmes[8].The First Medical School was developed from 1966 and there was only one medical school in the country all the years until in recent time we have seen six Medical schools that have developed. So what Hafferty F.W wrote and said that there must be many efforts to reform the medical curriculum is a challenge to us at our Michael Sata Medical in Ndola Zambia.

We feel six years is a challenge to sit down and think over what we are going through. It is a stratagem of wrong practice if we carry on for years without having to reform the medical curriculum. Thus we felt as surgeons we needed to relook at the curriculum and compare it to our current activities and change them as we function as a medical school.

We feel that the medical school on the Copperbelt should get into all the Medical Hospitals on the region by acquiring a proper Memorandum of Understanding (MoU). We feel that the curriculum of theatre training of our students should be changed so that theatre standards are maintained but the technical availability will allow our students can have great knowledge, particularly at Ndola. We feel that the CBU must employ more Clinical trainers so that the PBL can be used more effectively. We also feel every lecturer must accept the OSCEs. The change should be the School of medicine standard demand [12].

In Zambia clinical training of Medical students leads to examinations that must be marked. The rising of the numbers of students wanting to do medicine has made exam marking an overwhelming hard work. We feel computerized marking should be employed as soon as possible.

We have come to know that Some medical schools allow their teachers to undergo what is known as Objective-structured teaching encounters (OSTEs). These are used across many disciplines to assess the lecturers teaching ability. We too need it.

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