EVALUATION OF KNOWLEDGE OF ORTHO-PLASTIC APPROACH IN THE MANAGEMENT OF POST TRAUMATIC LOWER LIMB INJURIES IN KENYATTA NATIONAL HOSPITAL

PRINCIPAL INVESTIGATOR

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A research proposal submitted in part fulfilment for the award of the degree of master of medicine in Plastic, Reconstructive and Aesthetic Surgery, University of Nairobi

2020

DECLARATION

I hereby declare that this proposal is my original work and has not been submitted for award of any degree in any institution.

_____ _____

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H58/80982/2015

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DEPARTMENTAL APPROVAL

This research proposal has been presented at the Plastic Surgery departmental meeting and is hereby approved for presentation to the Kenyatta National Hospital Ethics and Research Committee.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS

BAPRAS – The British Association of Plastic Reconstructive and Aesthetic Surgeons

BOA – The British Orthopaedic Association

KNH – Kenyatta National Hospital

MBChB – Bachelor of Medicine and Bachelor of Surgery

UK – United Kingdom

UON – University of Nairobi

ABSTRACT

Background: Ortho-plastic management in post-traumatic lower limb injuries remains core in ensuring the best results are achieved for the patient. This has been shown to reduce complications and the rate of limb amputations. An Ortho-plastic approach also reduces healthcare costs and length of hospital stay. This approach is yet to be well implemented in our setting. This study aims to establish the understanding and the current Ortho-plastic management of patients with post-traumatic lower limb injuries. This is the first step in determining how to implement the Ortho-plastic approach.

Study Objective: The aim of this study was to evaluate the understanding of Ortho-plastic approach in the management of post traumatic lower limb injuries.

Materials and Methods: This was a descriptive cross sectional study which was carried out over a three month period. The sample size was 84 surgical residents. The study was conducted in all surgical wards of Kenyatta National Hospital and University of Nairobi, School of Medicine lecture theatres. A self-administered questionnaire was given to all the 84 surgical residents who were currently rotating or had rotated through the Orthopaedic and Plastic Surgery departments at KNH. Data were extracted and entered into an Ms excel sheet and encrypted for safety. The data were then analysed and percentage and proportions used to describe the data. Ethical approval was sought from the KNH-UON Ethics and Research Committee.

Results: Eighty four (84) surgical residents were recruited into the study majority of whom were Orthopaedics Surgery residents 45(53.6%) followed by Plastic Surgery residents 17(20.2%), they were from second to fifth year of study. Eighty (80) had done at least three months orthopaedics rotation and 32 had done three months of plastic surgery rotation. Ninety point five percent (90.5%) of the residents had no knowledge of any Ortho-plastic protocol and there was no Ortho-plastic protocol in use at Kenyatta National Hospital. The most common indication for Ortho-plastic consultation was a compound fracture ready for reconstruction with a flap and Gustillo Anderson 3B compound fracture as stated by 66.7% of the residents. Only two out of six knowledge based questions of the Ortho-plastic approach were answered correct by more than 70% of the residents. Gustillo Anderson classification system was the most commonly used classification system for compound fractures as stated by 96% of the residents. The resident in Orthopaedics Surgery was the one who commonly classified and first debrided compound fractures. Plastic Surgery were commonly consulted

for wounds that required flap closure. The greatest barriers to Ortho-plastic approach were availability of theatre space and lack of a protocol for Ortho-plastic collaboration.

Conclusion: There is a gap in knowledge and practice of the Ortho-plastic approach in the management of lower limb injuries at KNH amongst the surgical residents of UON. There is also lack of a protocol for Ortho-plastic collaboration at KNH.

INTRODUCTION

A multisite surveillance study done in Kenya by Botchey *et al* showed that the lower limb is the most commonly affected region of the body following trauma at around 35.1% of the cases and is mainly caused by road traffic accidents (1). According to the World Health Organization the cost of injury to the Kenyan economy caused by road traffic accidents exclusive of loss of life is in excess of 50 million US Dollars(2). Data from the Health Information Department at Kenyatta National Hospital showed a total of 225 admissions to the orthopaedics ward with open fractures from 1st January 2018 to 31st December 2018.

The importance of the lower limbs cannot be over emphasized as loss of pedal function greatly impacts on the quality of life of an individual both in terms of basic functions such as going to the bathroom to earning a living by going to work. This reduction in productivity also affects the community and the nation at large and all efforts should be made to ensure quick return to functionality.

The lower limb, particularly the leg, is in danger of having compound fractures because it is appendicular and the superficial nature of the tibia. This poses a great challenge in management of both the bony framework and soft tissue cover as bone and soft tissue loss are very common. Lower limb reconstruction is aimed at preventing amputation, restoring function and improving quality of life (3). Time is of the essence and hence to avert amputation and restore function, early and effective management of both skeletal and soft tissue defects is required.

Reconstruction of the lower limb is usually undertaken by both the orthopaedic surgeon and the plastic surgeon. This multidisciplinary approach ensures the best outcome in these injuries. At KNH lower limb trauma patients are first reviewed at casualty where the screening doctor performs the emergency treatment then the Orthopaedic resident is called to continue management of the patient. The Patient will then undergo debridement, fixation of bone by either internal or external fixation or soft tissue coverage. The Plastic Surgery team will be called upon for soft tissue and or bony reconstruction. Other teams such as the vascular surgeons will be called upon on case by case basis.

According to the KNH Health Information Department, patients who required reconstruction stayed an average of 62 days in the ward which is almost triple the average duration of hospital stay in centres that have implemented the Ortho-plastic approach (4).

LITERATURE REVIEW

History of Ortho-plastic approach

Ortho-plastic approach in the management of lower limb trauma was first coined by L. Scott Levin in the 1990s (5). He described the use of the reconstruction ladder in the management of soft tissue defects of complex lower extremity injuries with the lowest rung that could close the defect being the treatment of choice.

Before this, the first orthopaedic and plastic surgery collaboration can be traced back to Sir Harold Gillies who is considered father of modern plastic surgery and Sir W. Arbuthnot Lane an orthopaedic surgeon who introduced internal fixation of fractures. The two surgeons worked together at Queen Mary's Hospital in Sidcup during World War 1 (3). The field of Ortho-plastic surgery kept growing with advances in the field of reconstructive micro-surgery. The field of reconstructive micro-surgery was advanced by notable figures such as Harry Bunke, Komatsu and Tamai who are considered the pioneers in limb replantation, Julius Jacobsen and Ernesto Suarez who introduced the operating microscope, Rollin Daniel and Ian Taylor who performed the first free groin flap to the lower extremity and free vascularized fibula flap (6).

In 1986 Marko Godina introduced the concept of early radical debridement and soft tissue coverage within the first three days of injury and it came to be known as *the Godina method of treating complex lower extremity wound* (6-7). Godina noted that his method resulted in reduction in complications such as osteomyelitis and non-union of fracture, reduction in average length of hospital stay and the number of operations required by the patient and this gave birth to Ortho-plastic approach as coined by L. Scott Levin(3,6). The field of Ortho-plastic surgery has grown and is still evolving on both Orthopaedic and Plastic Surgery frontiers.

Definition of Ortho-plastic Approach

The Ortho-plastic approach in lower limb injuries involves both the orthopaedic surgeon and plastic surgeon in the management of the injury. The two surgeons have different skill sets which are harmonized to ensure the best outcome for the patient.

The two surgeons debride the wound, the orthopaedic surgeon fixes the bone defect and the plastic surgeon reconstructs the soft tissue defect (8-9).

Ortho-plastic Protocols and guidelines

Currently, The British Association of Plastic Reconstructive and Aesthetic Surgeons (BAPRAS) and The British Orthopaedic Association (BOA) have one of the most elaborate guidelines and protocol for Ortho-plastic approach published in 2009 in a document named 'Standards of Management of Open Fractures of the Lower Limb' (9-13). This has become the standard of care of lower limb injuries in the United Kingdom (UK). They have been able to contribute to the development of Ortho-plastic practice in the developing world such as in Pakistan (10).

The document gives evidence and elaborates each and every step of the Ortho-plastic approach from the establishment of specialist Ortho-plastic centres to the referral system. It also elaborates and gives step by step guidelines for the management of a patient with a lower limb injury. These recommendations and guidelines as prescribed can find application beyond the UK (9).

Some of the recommendations which are relevant to our setup include (9):

i) Timing of wound excision; where it is recommended to be done within 24 hours of injury or within normal working hours and should be performed by a senior plastic and a senior orthopedic surgeon unless there is gross contamination of the wound, compartment syndrome, devascularised limb or a multiply injured patient.

ii) Antibiotic prophylaxis should be started within three hours of injury and continued up to 72 hours or soft tissue closure. The antibiotics of choice are co-amoxiclav and a cephalosporin or clindamycin in cases of penicillin allergy. Gentamicin is given at the start of debridement.

iii) Classification of open fractures can be done by various methods. These include *extremity injury scoring systems* which help in the decision of whether to salvage or amputate a limb. Examples are the Mangled Extremity Scoring System which is one of the most common in this method, or the NISSA system. The other classification system is the *grading system* which mainly focuses on the limb and the most widely used system is the Gustillo and Anderson classification which is also the most common classification. Another grading method is Byrd and Spicer. Finally there are the *comprehensive systems* classification system such as AO and Ganga Hospital Score. Principally, the recommendation is that the classification system should be accurate, simple and reproducible.

iv) The recommendation for skeletal stabilization and soft tissue reconstruction is that these two should be planned and carried out at the same time and as early as possible, within five days.

Other protocols are institutional based as opposed to the national protocols such as the BAPRAS/BOA protocols. Institutions that have been able to institute the Ortho-plastic approach report improved outcomes(3) such as Karolinska University Hospital in Stockholm Sweden(10), Jinnah Hospital in Lahore Pakistan(4) and Ganga Hospital in Coimbatore India(14). In South Africa there is also a push to Ortho-plastic training for management of complex lower limb injuries due to the high infection and delay in appropriate management such as both teams not being present at the first debridement (15).

Benefits of Ortho-plastic Approach

Since its inception evidence has shown that Ortho-plastic approach offers the best results in the management of lower limb injuries as evidenced by (3-16):

i) Reduction in the rate of infection.
ii) Improved and faster bone union
iii) Better soft tissue healing
iv) Reduced length of hospital stay
v) Reduced number of operations required
vi) Quicker rehabilitation and weight bearing
vii) Improved success of soft tissue reconstruction especially free flaps which become difficult to perform with continued inflammation
viii) Overall reduction in cost of healthcare

Implementation of the Ortho-plastic Approach

Key to the implementation of the Ortho-plastic approach is ensuring that the multidisciplinary team; the orthopaedic and plastic surgery teams, fully understand their roles and the roles of the other and should be fully qualified to carry out their roles.

Next is to have dedicated on - call teams, ward rounds, theatres and clinics.

Finally, support infrastructure such as intensive care units, rehabilitation centres, counsellors, health information officers and a system of auditing results must be available(9).

STUDY JUSTIFICATION AND UTILITY

Data from the Statistics Unit of the Health Information Management of KNH indicated that from 1st January 2018 to 31st December 2018 two hundred and twenty five (225) patients were admitted with compound fractures to the Orthopaedics department of KNH with only thirty two (32) having reconstruction done. Those who had reconstruction done had an average length of hospital stay of 62 days. This is far much longer than in institutions that have implemented Ortho-plastic protocols. This study is a first step in understanding the current Ortho-plastic practice at KNH. The residents were selected as they are the primary doctors who manage these patients when they are admitted to the hospital.

Determining the current understanding of Ortho-plastic approach is the first step in determining the gaps in Ortho-plastic practice at Kenyatta National Hospital and this study aims to determine this.

This study will inform policy making regarding strengthening Ortho-plastic practice such as setting up an Ortho-plastic clinic, dedicated Ortho-plastic ward rounds and dedicated Ortho-plastic calls and theatre schedules as well as aid in the development of an Ortho-plastic protocol.

This study will also inform curriculum development at the University of Nairobi for Ortho-plastic trainings and workshop.

RESEARCH QUESTION

What is the current knowledge of Ortho-plastic approach in the management of post traumatic lower limb injuries amongst surgical residents of the University of Nairobi, School of Medicine at Kenyatta National Hospital?

STUDY OBJECTIVES

BROAD OBJECTIVE

To evaluate the understanding of Ortho-plastic approach in management of post traumatic lower limb injuries amongst surgical residents of the University of Nairobi, School of Medicine at Kenyatta National Hospital.

SPECIFIC OBJECTIVES

a) To determine the existence and use of any Ortho-plastic protocol amongst surgical residents of UON, School of Medicine at KNH.
b) To determine the indications for Ortho-plastic consultation at KNH amongst surgical residents of UON, School of Medicine.
c) To assess the current management of post traumatic lower limb injuries at KNH by surgical residents of UON, School of Medicine.
d) To determine the barriers to Ortho-plastic approach in the management of post traumatic lower limb injuries at KNH amongst surgical residents of UON, School of Medicine.

METHODOLOGY

STUDY DESIGN

This was a descriptive cross sectional study.

STUDY SETTING

The study was carried out in all surgical wards at Kenyatta National Hospital and at Lecture theatre one and three at the University of Nairobi, School of Medicine, Kenyatta campus. Data were collected over a one month period.

STUDY POPULATION

All surgical residents enrolled at the UON, School of Medicine, currently rotating or have previously rotated in the Orthopaedic Surgery and Plastic Surgery departments at KNH who fulfil the inclusion criteria.

SELECTION CRITERIA

Inclusion Criteria

1. All surgical residents currently rotating in the Ortho-paedic Surgery department at KNH.
2. All surgical residents currently rotating in the Plastic Surgery department at KNH.

Exclusion Criteria

1. Unwillingness to participate in the study and not signing an informed consent form.

SAMPLING METHOD

Convenience sampling method was used to recruit eligible participants into the study until the full sample size was achieved. Participants were approached by the principal investigator and invited to the study.

SAMPLE SIZE CALCULATION

The total sample size was 84 surgical residents and all were sampled due to their small number.

Surgical residents in Orthopaedic department – 64

Surgical residents in Plastic Surgery department - 20

DATA COLLECTION

Participants who met the inclusion criteria were approached by the principal investigator in the surgical wards at KNH and lecture theatres one and three at the UON School of Medicine from 1st April 2020 to 30th April 2020. Recruitment in the surgical wards was done after ward rounds, recruitment in lecture theatre one was done after the Orthopaedic Grand Round and Tumour Board meeting, while recruitment in lecture theatre three was done after the Surgical Grand Round. Recruitment was verbal, and the participants were duly informed of the nature and purpose of the study. For those who agreed to participate in the study, informed consent was obtained and were enrolled into the study.

The research instrument was a self-administered questionnaire as outlined in Appendix III. This questionnaire was used for data collection.

DATA ENTRY AND ANALYSIS

Data entry was done by the principal investigator and his trained assistant onto an Ms excel sheet and encrypted for safety. All the entered data were checked for consistency and validity by the investigator before analysis. The data collected were analysed and described using frequency, percentage and proportion. The findings were then presented in Tables, Bar charts and Graphs.

ETHICAL CONSIDERATION

This study commenced after approval from the Department of Surgery UON and the UON/KNH Ethics and Research Committee.

Informed consent was obtained from all participants prior to enrolment in to the study.

Participants were be coerced to enrol into the study.

Participant confidentiality was ensured with no names or identifiers collected in the data collection sheet.

All study material was stored safely by the researchers only. Electronic data file generated was encrypted with a password that was only available to the research team.

There were no risks involved in this study.

The study investigators had no conflict of interest to declare.

RESULTS

Eighty four surgical residents who had done or were doing a rotation in Orthopaedics or Plastic surgery at the University of Nairobi and were using Kenyatta National Hospital as the teaching hospital were interviewed.

CHARACTERISTICS OF RESPONDENTS

Characteristics of those interviewed were as follows: 45 Orthopaedic Surgery residents, 17 Plastic Surgery residents, 12 General Surgery residents, 3 Neuro-surgery residents, 2 ENT residents, 2 Urology residents, 1 Maxillofacial Surgery resident, 1 Thoracic and Cardio-vascular Surgery resident and 1 Paediatric Surgery resident (Table 1) .

The residents were between Year 2 and Year 5 of residency. Majority, 80 had done three or more months of Orthopaedic Surgery rotation while 32 had done three or more months of plastic surgery rotation and 38 had done one month of plastic surgery rotation as shown in Table 1 below.

Table 1: Characteristics of Respondents

Cadre	**Frequency**	**Percent of respondents *(n=84)***
M Med. Orthopaedic Surgery Resident	45	53.6
M Med Plastic Surgery Resident	17	20.2
M Med General Surgery Resident	12	14.3
MDS Maxillofacial Surgery Resident	1	1.2
M Med ENT Resident	2	2.4
M Med Paediatric Surgery Resident	1	1.2
M Med Neurosurgery Resident	3	3.6
M Med Urology Resident	2	2.4
M Med Thoracic and Cardiovascular Surgery Resident	1	1.2
Year of Study	**Frequency**	**Percent of respondents *(n=84)***
II	24	28.6
III	31	36.9

IV	14	16.7
V	15	17.9
Length of rotation in Orthopaedic Surgery	**Frequency**	**Percent of respondents *(n=84)***
1 month	2	2.4
3 months	40	47.6
>3 months	40	47.6
No rotation	2	2.4
Length of rotation in Plastic Surgery	**Frequency**	**Percent of respondents *(n=84)***
1 month	38	45.2
3 months	17	20.2
>3 months	15	17.9
No rotation	14	16.7

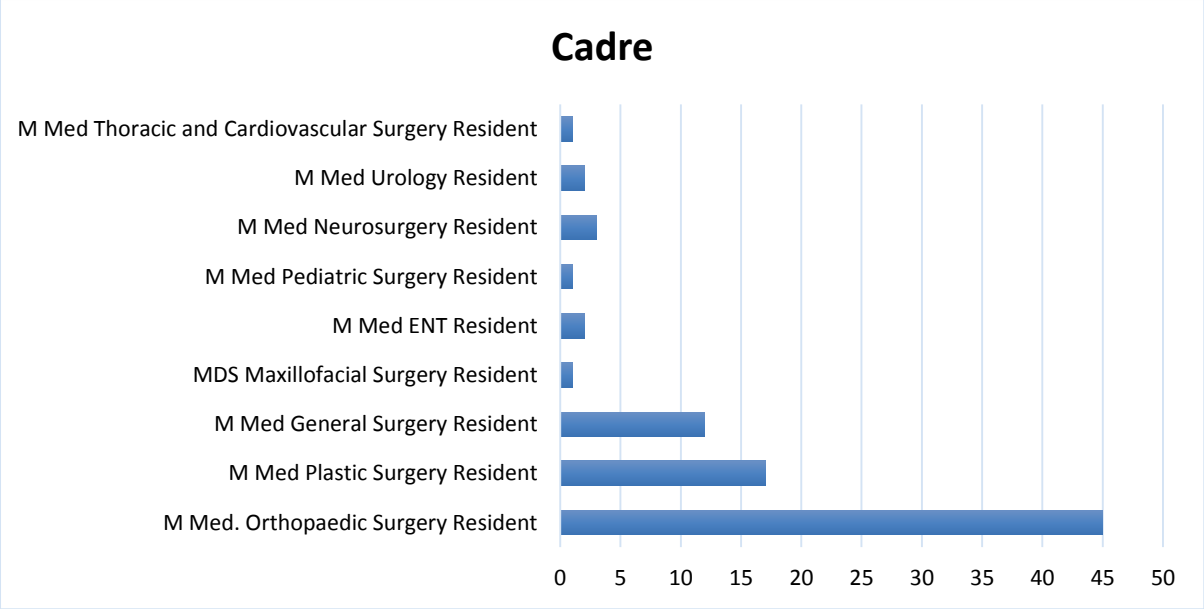


Figure 1: Cadre

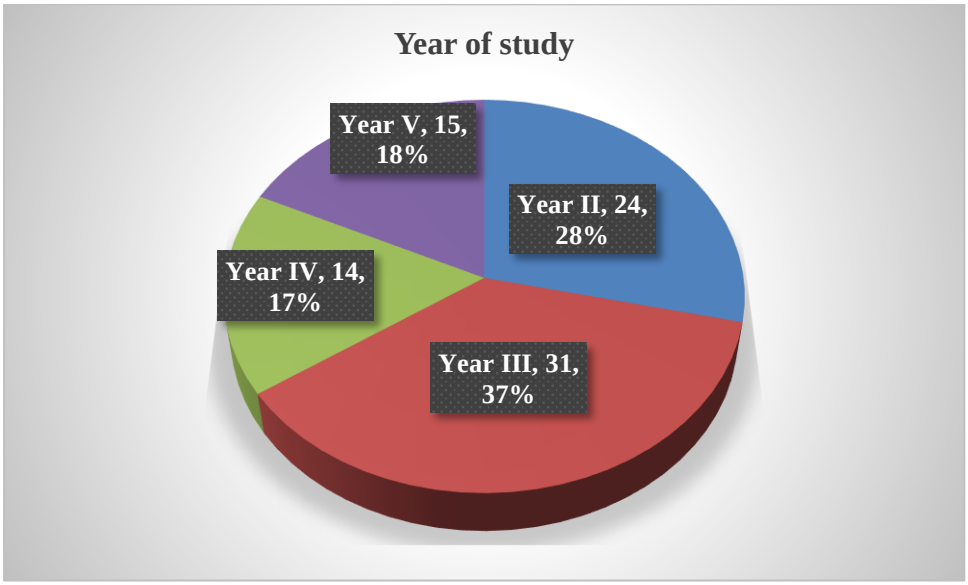


Figure 2: Year of study

KNOWLEDGE OF ORTHO-PLASTIC PROTOCOL IN MANAGEMENT OF LOWER LIMB INJURIES

a) Knowledge of existence and use of Ortho-plastic protocol at KNH

Seventy six (76) of eighty four (84) surgical residents (90.5%) had no knowledge of the existence of an Ortho-plastic protocol for the management of lower limb injuries. Only Eight out of 84 respondents (9.5%) had knowledge of existence of an Ortho-plastic Protocol. All eight were familiar with the BAPRAS/BOA Protocol but none had used any in their practice while managing patients with lower limb injuries at KNH.

Table 2: Knowledge of existence of Ortho-plastic protocol

Do you have knowledge of existence of any Ortho-plastic protocol?	**Frequency**	**Percent of respondents *(n=84)***
Yes	8	9.5
No	76	90.5

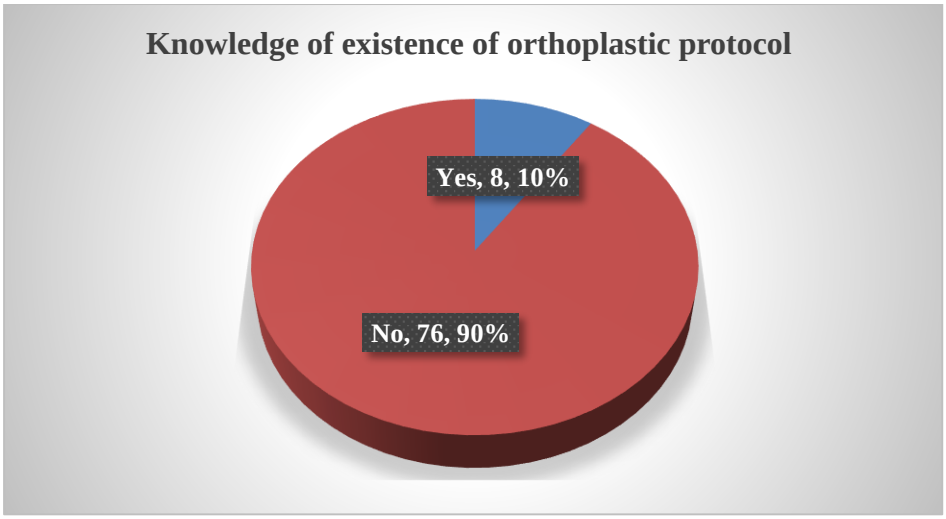


Figure 3: Knowledge of existence of orthoplastic protocol

b) Knowledge of who should classify compound fractures

Three out of the 84 residents knew that the Orthopaedic Consultant and Plastic Surgery consultant should classify compound fractures as recommended by the BAPRAS/BOA Ortho-plastic Protocol. The Orthopaedic resident was selected most at 20.2%, as the person who should classify compound fractures followed by the Orthopaedic resident and plastic surgery resident at 16.7% (Table 3).

Table 3: Knowledge of who should classify compound fractures

Based on your knowledge who should classify compound fractures?
Admitting doctor at casualty
Admitting doctor at casualty + Orthopaedic Resident
Admitting doctor at casualty + Orthopaedic Resident + Orthopaedic consultant
Admitting doctor at casualty + Orthopaedic Resident + Plastic Surgery resident
Admitting doctor at casualty + Orthopaedic Resident + Plastic Surgery resident + Orthopaedic consultant + Plastic surgery consultant
Orthopaedic consultant
Orthopaedic consultant + Plastic surgery consultant
Orthopaedic Resident
Orthopaedic Resident + Orthopaedic consultant
Orthopaedic Resident + Plastic Surgery resident
Orthopaedic Resident + Plastic Surgery resident + Orthopaedic consultant + Plastic surgery consultant
Plastic Surgery resident

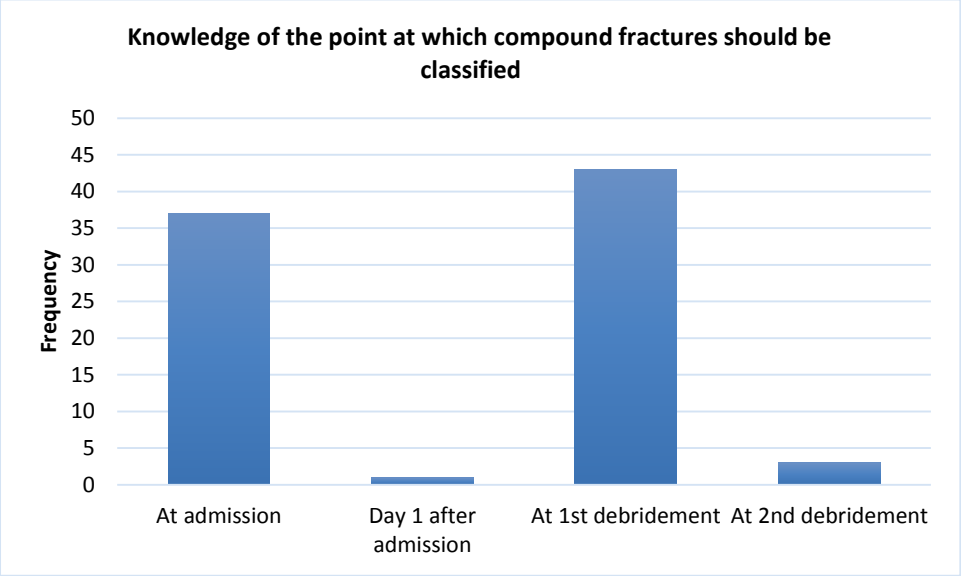
c) Knowledge of the point at which compound fractures should be classified

Forty three (43) of Eighty four (84) residents stated that compound fractures should be classified at first debridement and 37 at admission. This is summarized in Table 4 below.

Table 4: Knowledge of the point at which compound fractures should be classified

Based on your knowledge at what point in patient management should compound fractures be classified?	**Frequency**	**Percent of respondents *(n=84)***
At admission	37	44.0
Day 1 after admission	1	1.2
At 1st debridement	43	51.2
At 2nd debridement	3	3.6

Figure 4: Knowledge of the point at which compound fractures should be classified



d) Knowledge of the timeline to first debridement of a compound fracture following admission

Ninety point five percent (90.5%) of the residents stated that debridement should be done within 12 hours and 7.1% stated 12-24 hours following admission as summarized in Table 5 below, BAPRAS/BOA protocol recommends debridement within 24 hours.

Table 5: Knowledge of the timeline to first debridement of a compound fracture following admission

Based on your knowledge what should be the timeline to the first debridement following admission of a patient with compound fracture?	**Frequency**	**Percent of respondents *(n=84)***
Within 12 hours	76	90.5
12 – 24 hours	6	7.1
24 – 72 hours	1	1.2
Within 6 hours	1	1.2

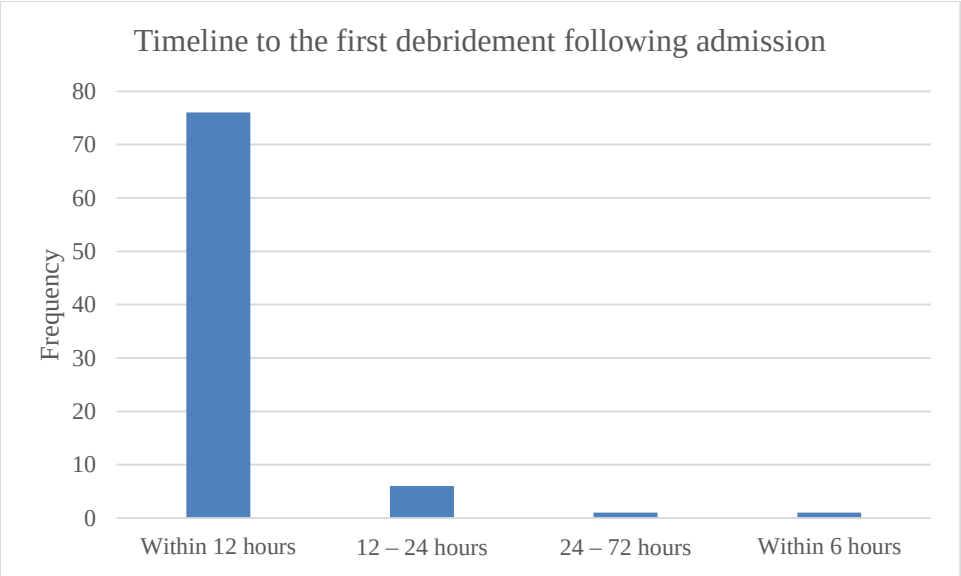


Figure 5: Timeline to the first debriment following admission

e) <u>Knowledge of who should perform the first debridement</u>

From the knowledge of residents, 63.1% stated that the first debridement should be done by the Orthopaedic and Plastic Surgery resident while 22.6% stated that the orthopaedic resident should perform the first debridement. Only seven out of 84 residents (8.3%) knew that the Orthopaedic and Plastic Surgery Consultant should be the ones to perform the first debridement as prescribed by the BAPRAS/BOA Protocol.

Table 6: Knowledge of who should perform the first debridement

Based on your knowledge, who should perform the first debridement of a compound fracture in your practice at KNH?	**Frequency**	**Percent of respondents *(n=84)***
Orthopaedics resident	19	22.6
Plastic surgery resident	2	2.4
Orthopaedic and Plastic surgery resident	53	63.1
Consultant Orthopaedics	1	1.2
Orthopaedic and Plastic Surgery Consultant	7	8.3
Admitting Doctor	1	1.2
Doctor in contact with patient	1	1.2

f) Knowledge of when internal fixation should be done

Based on the knowledge of the residents internal fixation should be done within a week of injury as reported by 59 (70.2%) residents. The second most common timeline was two weeks following injury which was reported by 13 residents, eight stated it should be done one week following injury while three said three weeks after injury.

Table 7: Knowledge of when internal fixation should be done

Based on your knowledge approximately how many weeks following injury should fixation of bone occur?	**Frequency**	**Percent of respondents *(n=84)***
<1	59	70.2
1	8	9.5
2	13	15.5
3	3	3.6
4	1	1.2

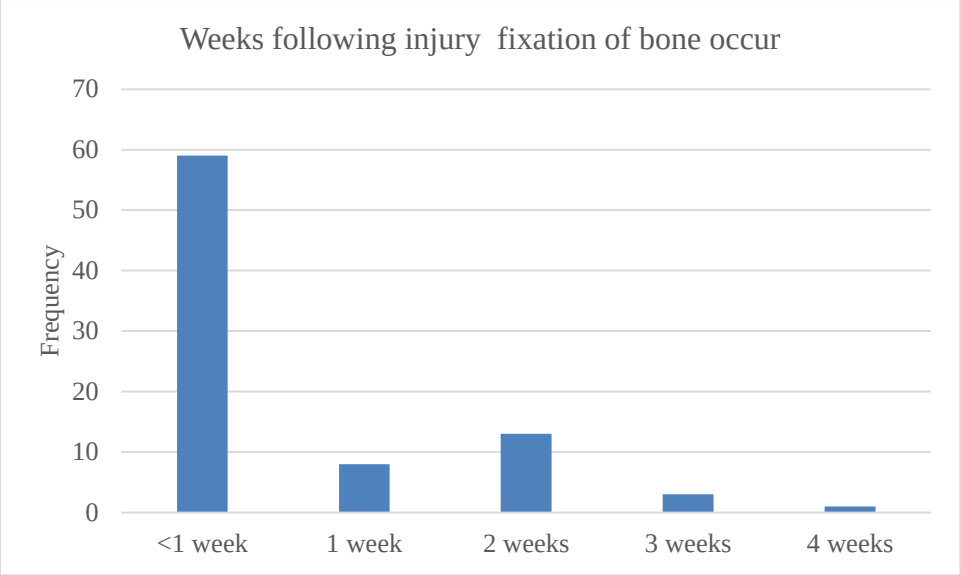


Figure 6: Weeks following injury fixation of bone occur

g) Knowledge of when soft tissue reconstruction should be done

Based on the knowledge of the residents, 33(39%) stated that soft tissue reconstruction should be done during external fixation as is recommended by the BAPRAS/BOA guidelines, 26 (31%) stated that it should be performed within a week after external fixation, 21(25%) stated it should be done within two weeks of external fixation while four (4.8%) stated that it should be performed within three weeks of external fixation. This is shown in Table 8 below.

Table 8: Knowledge of when soft tissue reconstruction should be done

Based on your knowledge, when should soft tissue reconstruction be performed?	**Frequency**	**Percent of respondents *(n=84)***
During fixation of an external fixator	33	39.3
Within a week after external fixation	26	31.0
Within 2 weeks after external fixation	21	25.0
Within 3 weeks of external fixation	4	4.8

INDICATIONS FOR ORTHO-PLASTIC CONSULTATION AT KNH

The most common indication for Ortho-plastic consultation was a compound fracture that was ready for reconstruction with a flap and Gustillo Anderson 3B compound fracture as reported by 66.7% of the residents. The second most common indication was a compound fracture after first debridement that is not amenable to primary closure 57.1%. The third most common indication was a Gustillo 3C compound fracture 50%. The least common indication

was Gustillo Anderson 2 compound fracture stated by 8.3% of respondents while the second least common indication was any compound fracture. The results are shown in Table 9 below.

Table 9: Indications for Ortho-plastic consultation at KNH

What is the indication for Ortho-plastic consultation in your practice at KNH?	**Frequency**	**Percent of respondents *(n=84)***
Gustillo Anderson 2	7	8.3%
Gustillo Anderson 3A	33	39.3%
Gustillo Anderson 3B	56	66.7%
Gustillo Anderson 3C	42	50.0%
Any compound fracture	19	22.6%
Following 1st debridement of a wound not amenable to primary closure	48	57.1%
Wound that is clean with good granulation tissue not amenable to primary closure	41	48.8%
Compound fracture that is ready for reconstruction with a flap	56	66.7%
Consultants' recommendation	29	34.5%

CURRENT ORTHO-PLASTIC MANAGEMENT OF POST TRAUMATIC LOWER LIMB INJURIES AT KNH

a) Classification system for compound fractures

Classification of compound fractures was commonly done using the Gustilo Anderson system which was used by 96.4% of the residents. AO system is used by only 3.6%. This is shown in table 10 below.

Table 10: Classification system for compound fractures

Classification system used for compound fractures	**Frequency**	**Percent of respondents *(n=84)***
Gustilo and Anderson Classification system	81	96.4
AO System	3	3.6

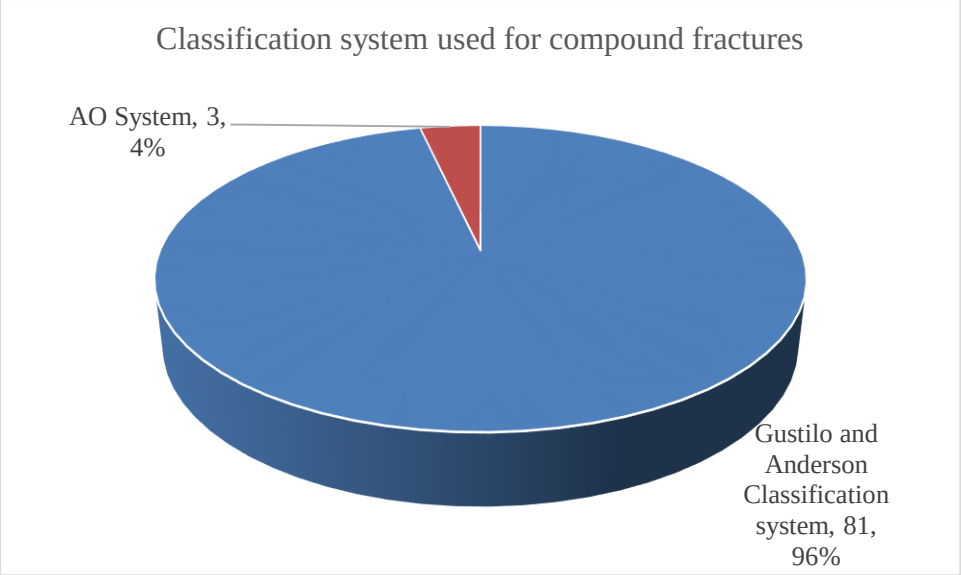


Figure 7: Classification system used for compound fractures

b) Who classifies compound fractures at KNH

Classification of compound fractures was done by the Orthopaedic resident as reported by 76.2% of the residents or by the admitting doctor at casualty who could be the medical officer at casualty or the resident on call in Orthopaedics as reported by 22.6% of the respondents. This is showed in Table 11.

Table 11: Who classifies compound fractures at KNH

Classification of compound fracture at the practice	**Frequency**	**Percent of respondents *(n=84)***
Admitting doctor at casualty	19	22.6
Orthopaedic Resident	64	76.2
General Surgery Resident	1	1.2

c) Point at which compound fractures are classified

Currently compound fractures are mostly classified at admission as reported by 54(64.3%) of the residents with some classification occurring at 1st debridement as reported by 23(27.4%) of the residents. The other responses are also shown in Table 12.

Table 12: Point at which compound fractures are classified

At what point in patient management are compound fractures classified in your practice?	**Frequency**	**Percent of respondents *(n=84)***
At admission	54	64.3
Day 1 after admission	4	4.8
At 1st debridement	23	27.4
At 2nd debridement	1	1.2
Both at admission and at 1st debridement	2	2.4

d) Timeline to first debridement

Majority of the residents, 44(52.4%), did the first debridement 24-48 hours after admission. Twenty (23.8%) residents did their first debridement 12-24 hours. Eight residents did the first debridement within 12 hours and another eight did their debridement 3-7 days after admission. Two residents reported that debridement was done when theatre was available. This is shown in Table 13.

Table 13: Timeline to first debridement

What is the timeline to the first debridement following admission of a patient with compound fracture in your practice at KNH?	**Frequency**	**Percent of respondents *(n=84)***
Within 12 hours	8	9.5
12 – 24 hours	20	23.8
24 – 72 hours	44	52.4
3 – 7 days	8	9.5
All of the above	1	1.2
12 - 72 hours	1	1.2
Whenever the OR is ready	1	1.2
Depends on availability of theatre	1	1.2

e) Who performs the first debridement

Currently, the Orthopaedic resident performs the first debridement as reported by 95.2% of the residents. This is as shown in table 14.

Table 14: Who performs the first debridement

Who performs the first debridement of a compound fracture in your practice at KNH?	**Frequency**	**Percent of respondents *(n=84)***
Orthopaedics resident	80	95.2
Orthopaedic and Plastic surgery resident	2	2.4
Orthopaedic and Plastic Surgery Consultant	1	1.2
General Surgery Resident	1	1.2

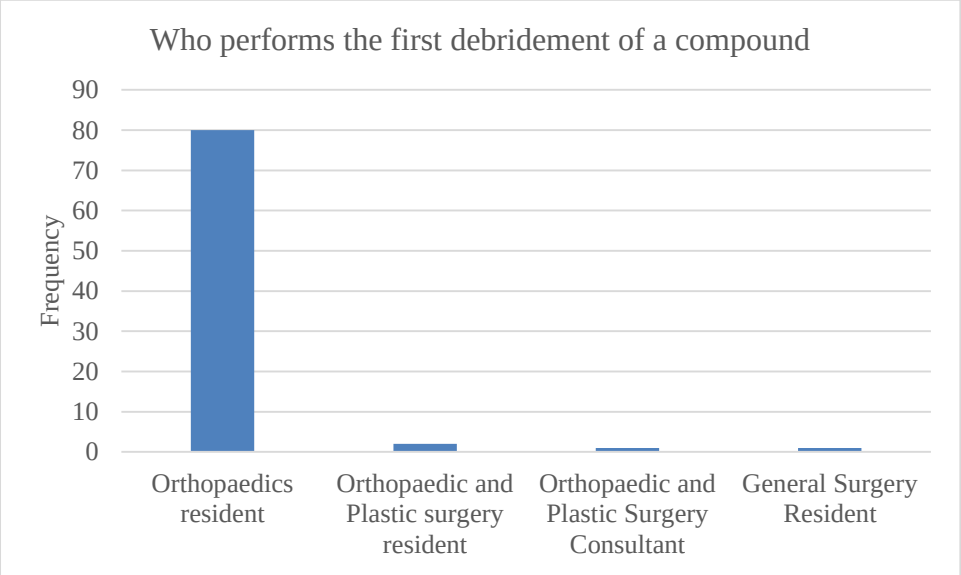


Figure 8: Who performs the first debridement of a compound

f) Number of times debridement is done before definitive fixation and soft tissue reconstruction

Compound fractures were commonly debrided twice before definitive fixation and soft tissue reconstruction was done as reported by 50% of the residents. Thirty one percent (31%) of the residents reported they debrided compound fractures thrice and three (3.6%) of the residents reported debriding compound fractures 5 times as shown in Table 15.

Table 15: Number of times debridement is done before definitive fixation and soft tissue reconstruction

How many times on average do you debride compound fractures before definitive fixation and soft tissue reconstruction?	**Frequency**	**Percent of respondents *(n=84)***
1	9	10.7
2	42	50.0
3	26	31.0
4	3	3.6
5	1	1.2
>5	3	3.6

g) Criterion used to determine a wound has been adequately debrided

Good granulation tissue was the most common criteria used to determine a wound was adequately debrided. This was used by 50% of the residents followed by lack of necrotic tissue used by 40.5% of residents. Only six residents used bacterial load to determine that a wound has been adequately debrided.

Table 16: Criterion used to determine a wound has been adequately debrided

What criterion is used to determine a wound has been adequately debrided?	**Frequency**	**Percent of respondents *(n=84)***
Bacterial load	6	7.1
Lack of pus	2	2.4
Lack of necrotic tissue	34	40.5
Good granulation tissue	42	50.0

h) Timeline to bone definitive bone fixation and soft tissue reconstruction

Definitive bone fixation was done at 2, 3 and 4 weeks as was reported by 22.6%, 21.4% and 15.5% of the residents respectively (Table 17). Soft tissue reconstruction is done more than three weeks after debridement as reported by 71.4% of the residents as shown in table 18.

Table 17: Timeline to bone definitive bone fixation

Approximately how many weeks following injury does fixation of bone occur?	**Frequency**	**Percent of respondents *(n=84)***
<1	11	13.1
1	9	10.7
2	19	22.6
3	18	21.4
4	13	15.5
5	2	2.4
>5	12	14.3

Table 18: Timeline to soft tissue reconstruction

When is soft tissue reconstruction performed in your practice at KNH?	**Frequency**	**Percent of respondents *(n=84)***
During fixation of an external fixator	3	3.6
Within a week after external fixation	3	3.6
Within 2 weeks after external fixation	12	14.3
Within 3 weeks of external fixation	6	7.1
More than 3 weeks after external fixation	60	71.4

i) Point at which plastic surgery consultation is done

Plastic surgery consultation is done commonly when the wound requires flap closure as reported by 40 of 84 residents interviewed. Only 15 residents consulted during the first debridement.

Table 19: Point at which plastic surgery consultation is done

At what point does the first plastic surgery consultation occur?	**Frequency**	**Percent of respondents *(n=84)***
After 1st debridement	15	17.9
After 2nd debridement	3	3.6
After 3rd debridement	3	3.6
When the wound is clean irrespective of reconstruction option required	22	26.2
When the wound requires flap closure	40	47.6
At point of admission	1	1.2

j) Who performs what soft tissue reconstruction in the residents' practice at KNH

According to our findings, primary closure was done by the Orthopaedic resident as reported by 98.8% of the residents. Sixty five point five percent (65.5%) of the residents reported that split thickness skin grafting was commonly done by both the Plastic Surgery resident and 61.9% of the residents reported it was done by the Orthopaedic Surgery resident. Seventy six point two percent (76.2%) of the residents reported Negative Pressure Wound Therapy was done by the Plastic Surgery resident. Ninety four percent (94%) of the residents reported that local flaps were commonly done by the Plastic Surgery resident. Eighty three point three percent (83.3%) of the residents reported that regional flaps were done by the Plastic Surgery resident. Sixty nine percent (69.0%) of the Residents said free flaps were performed by the Plastic Surgery Consultant.

Table 20: Who performs what soft tissue reconstruction in the residents' practice at KNH

	Frequency	**Percent of respondents *(n=84)***
Primary Closure	**N**	**%**
Orthopaedic Surgery Resident	83	98.8%
Plastic Surgery Resident	11	13.1%
Orthopaedic Surgery Consultant	2	2.4%
Split Thickness Skin Graft		
Orthopaedic Surgery Resident	52	61.9%
Plastic Surgery Resident	55	65.5%
Orthopaedic Surgery Consultant	4	4.8%
Plastic Surgery Consultant	1	1.2%

Vacuum Dressing		
Orthopaedic Surgery Resident	32	38.1%
Plastic Surgery Resident	64	76.2%
Orthopaedic Surgery Consultant	6	7.1%
Plastic Surgery Consultant	7	8.3%
Local Flap		
Orthopaedic Surgery Resident	10	11.9%
Plastic Surgery Resident	79	94.0%
Orthopaedic Surgery Consultant	4	4.8%
Plastic Surgery Consultant	13	15.5%
Regional Flap		
Plastic Surgery Resident	70	83.3%
Orthopaedic Surgery Consultant	5	6.0%
Plastic Surgery Consultant	32	38.1%
Free Flap		
Plastic Surgery Resident	45	53.6%
Orthopaedic Surgery Consultant	3	3.6%
Plastic Surgery Consultant	58	69.0%

k) Internal fixation and soft tissue reconstruction

Only 9.5% of the residents did internal fixation and soft tissue reconstruction most of the times, 53.6% of the residents sometimes did it while 36.9% did not.

Table 21: Internal fixation and soft tissue reconstruction

How often do you do internal fixation and soft tissue reconstruction in your practice	**Frequency**	**Percent of respondents *(n=84)***
Never	31	36.9
Sometimes	45	53.6
Most of the times	8	9.5

l) Follow up clinic

Upon discharge only 17.9 % of the residents discharged the patients through both Orthopaedic and Plastic Surgery Clinic, 78.6% discharged the patient through Orthopaedics Clinic only and 3.6% discharged them through Plastic surgery clinic only.

Table 22: Follow up clinic

Which clinic is a patient with compound fracture discharged through upon discharge in your practice at KNH?	**Frequency**	**Percent of respondents *(n=84)***
Orthopaedics Clinic	66	78.6
Plastic Surgery Clinic	3	3.6
Both	15	17.9

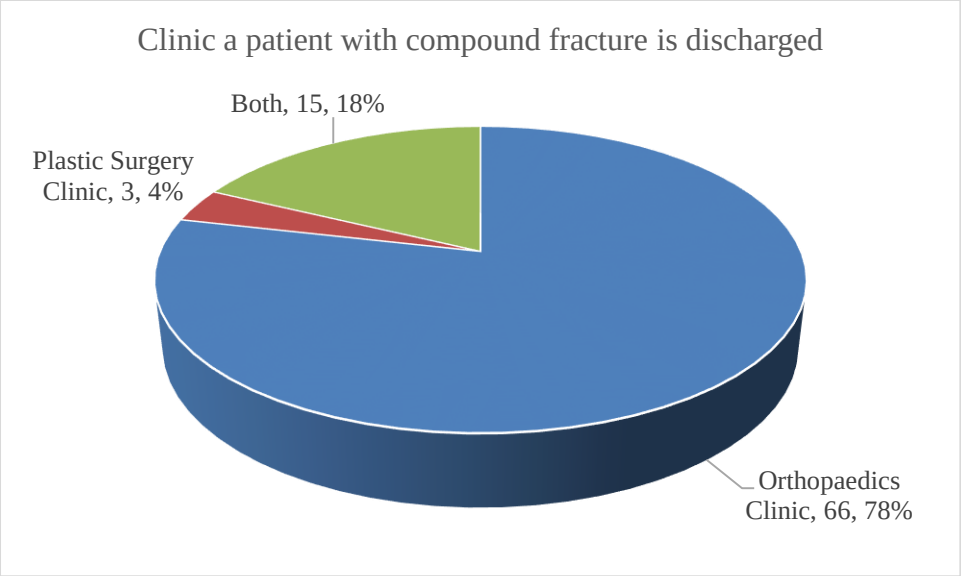


Figure 9: Clinic a patient with compound fracture is discharged

BARRIERS TO ORTHOPLASTIC APPROACH IN THE MANAGEMENT OF POST TRAUMATIC LOWER LIMB INJURIES AT KNH AMONGST SURGICAL RESIDENTS

We asked the interviewees to rank the following challenges as the first second and third biggest challenges to the Ortho-plastic approach in their practice at KNH when managing patients with lower limb injuries

- Availability of theatre space
- Lack of implants for bone fixation

- Lack of equipment for reconstruction
- Lack of appropriate dressing material
- Patient's financial constraints
- Lack of expertise
- Lack of a protocol for Ortho-plastic collaboration

We also gave them an option for others where they could report any other challenge that they thought was the 1st, 2nd or 3rd biggest challenge. The results were as follows:

a) First biggest barrier

Fifty percent (50%) of residents reported that the availability of theatre space was the first greatest challenge followed by lack of a protocol for Ortho-plastic collaboration reported by 40.5% of the residents as shown in Table 23.

Table 23: First biggest barrier to Ortho-plastic Approach

1st biggest barrier	**Frequency**	**Percent of respondents *(n=84)***
Availability of theatre space	42	50.0
Lack of a protocol for Ortho-plastic collaboration	34	40.5
Lack of implants for bone fixation	6	7.1
Lack of equipment for reconstruction	1	1.2
Others: Lack of good collaboration between orthopaedics and plastic surgery departments	1	1.2

b) Second biggest barrier

Again availability of theatre space and lack of a protocol for Ortho-plastic collaboration were the second biggest barriers to Ortho-plastic approach in the management of lower limb injuries. We also see other barriers such as lack of equipment for reconstruction, lack of implants for bone fixation, lack of appropriate dressing material, patient's financial constraints and lack of expertise as shown in Table 24.

Table 24: Second biggest barrier to Ortho-plastic Approach

2nd biggest barrier	**Frequency**	**Percent of respondents *(n=84)***
Availability of theatre space	26	31.0
Lack of a protocol for Ortho-plastic collaboration	19	22.6
Lack of equipment for reconstruction	14	16.7
Lack of implants for bone fixation	9	10.7
Lack of appropriate dressing material	8	9.5
Patient's financial constraints	4	4.8
Lack of expertise	4	4.8

c) Third biggest barrier

The third biggest barrier was financial constraints and lack of implants for bone fixation then lack of equipment for reconstruction and lack of a protocol for Ortho-plastic collaboration was fourth. Other barriers mentioned were delayed consultation and delayed response of the plastic team as shown in Table 25.

Table 25: Third biggest barrier to Ortho-plastic Approach

3rd biggest barrier	**Frequency**	**Percent of respondents *(n=84)***
Patient's financial constraints	17	20.2
Lack of implants for bone fixation	17	20.2
Lack of equipment for reconstruction	16	19.0
Lack of a protocol for Ortho-plastic collaboration	11	13.1
Availability of theatre space	8	9.5
Lack of expertise	7	8.3
Lack of appropriate dressing material	5	6.0
Others:	3	3.6
• Delayed consultation	(2)	
• Delayed response from plastics team	(1)	

DISCUSSION

The Department of Surgery at the University of Nairobi requires the residents in all its thematic units do three months rotation in Orthopaedic Surgery. The thematic units in the department of surgery are: Plastic Reconstructive and Aesthetic Surgery, General Surgery, Neurosurgery, Paediatric Surgery, ENT Surgery, Thoracic and Cardio-vascular Surgery and Urology. Only the residents in General Surgery proceed to do a three months rotation in Plastic Surgery in their third year of residency and the Plastic Reconstructive and Aesthetic Surgery residents proceed to the Thematic Unit of Plastic Reconstructive and Aesthetic Surgery for the remainder of their three years of study. During the Orthopaedic rotation the residents are first on call hence they are the first contact with any patient who requires an Orthopaedic Surgery review at the emergency unit at KNH; they review patients in the wards; perform emergency surgeries and also participate in elective surgeries. The Department of Orthopaedics also requires its residents to do a month rotation in Plastic Surgery.

The Ortho-plastic approach in lower limb injuries involves both the orthopaedic surgeon and plastic surgeon in the management of the injury. Ortho-plastic approach as opposed to the patient being managed first by Orthopaedic Surgeons then Plastic surgeons when needed was shown by Boriani *et al* to have better outcomes in their multicentre study (4). 'Standards of Management of Open Fractures of the Lower Limb' a protocol by BAPRAS/BOA (9) gives clear guidelines on the Ortho-plastic approach in the management of compound fractures of the lower limb and we used it in our study to bench mark the Ortho-plastic knowledge and practice at KNH.

We set out to determine if there is an Ortho-plastic protocol used by the residents at UON working in KNH; what their knowledge of Ortho-plastic approach was; what their indications for plastic surgery consultation were; their current practise in the management of lower limb injuries and barriers to the Ortho-plastic approach.

Ortho-plastic Protocol

Only 9.5% of the residents had knowledge of an Ortho-plastic protocol. All knew the 'Standards of Management of Open Fractures of the Lower Limb' a protocol by BAPRAS/BOA (9) but none used them in their practice. Over 90.5% of the residents had no knowledge of any Ortho-plastic protocol and this shows the huge knowledge gap which could be one of the reasons for the low numbers of patients who had reconstruction and long length

of hospital stay as was seen by Sommar *et al* at Karolinska University where formalization of collaboration of Ortho-plastic collaborations increased the number of soft tissue reconstructions done and shorter length of hospital stay (10). Clinical protocols and guidelines are one of the methods to improve outcomes in practise, provide a system which the healthcare providers can be audited against and also improve efficiency of a healthcare system (18-19).

Knowledge of Ortho-plastic Approach

We asked the residents six knowledge based questions to assess their knowledge of Ortho-plastic approach using BAPRAS/BOA protocol as our reference (9). Only two out of the six questions had more than 70% of the residents answering them correctly showing a huge gap in the knowledge of Ortho-plastic approach. The questions that were answered correctly were knowledge of the timeline to the first debridement which was answered correct by 97.6% of the residents and knowledge of when internal fixation should be done which was answered correctly by 70.2% of the residents. This justifies the need for training as training was one of the obstacles to Ortho-plastic approach as described by Nayagam *et al* (20).

Indications for Ortho-plastic Consultation

We set out to find out what are the common indications for consultation among Orthopaedic and Plastic surgery teams. The most common indications were a compound fracture that is ready for reconstruction with a flap and Gustillo Anderson 3B compound fracture as reported by 66.7% of the residents. In the Ortho-plastic approach both teams are required to review any patient with a compound fracture in order to improve outcomes. In our study 'Any compound fracture' was the second least indication for Ortho-plastic consultation showing a gap in practice.

Management of Lower Limb Injuries at KNH

Compound fractures are classified using the Gustillo Anderson classification as reported by 96.4% of the residents. It is the most common grading system according to BAPRAS/BOA guidelines (9). Classification was commonly done at admission as reported by 64.3% of the residents and it is done by the resident in Orthopaedics rotation as reported by 76.2%. According to the BAPRAS/BOA guidelines the recommendation is that the classification using Gustillo Anderson System should be done at first debridement as this is more accurate

and reduces inter-observer variability which is high while using Gustillo Anderson classification.

Fifty two point four percent (52.4%) of the residents said they do their first debridement 24-48 hours after admission. The first debridement is done by the resident in Orthopaedics as reported by 95.2% of the residents. Debridement is mostly done twice before definitive management. Reuss and Cole found no relationship between those debrided within six hours and those debrided up to 48 hours and deep infection nonetheless the recommendation by the guidelines in the BAPRAS/BOA Standards document is debridement should be done within 24 hours of injury (8-9). Rymer *et al* in their audit if adherence to BAPRAS/BOA protocol found that 98.8% of the patients were debrided within the first 24 hours (11). This is unlike our setting where only 33.3% of the residents performed debridement within 24 hours, if this can be translated to the patients who were able to be debrided in 24 hours. Good Granulation tissue is the most commonly used criteria to assess adequacy of debridement.

Fracture fixation is two to four weeks following debridement and soft tissue reconstruction is mostly done more than three weeks after external fixation. Raymer *et al* in their study 78.2% had soft tissue cover within seven days (11).The current practices at KNH of fracture fixation and soft tissue reconstruction have been associated with poor outcomes as discussed in the BAPRAS/BOA guidelines (9). Plastic Surgery team is commonly consulted when the wound requires flap closure while the recommendation by the BAPRAS/BOA protocol is that plastic surgery team should be in the initial debridement. According to our findings internal fixation and soft tissue reconstruction is not commonly done, it's done sometimes. The patients upon discharge are mostly followed up in the Orthopaedics Outpatient Clinic as reported by 78.6% of the residents.

Soft Tissue Reconstruction

We also wanted to find out who performs the various soft tissue reconstructive options in the residents' practice at KNH. We found out that primary closure and skin grafting are commonly done by the Orthopaedic Resident. Negative Pressure Wound Therapy, local and regional flaps are commonly done by the Plastic Surgery Resident. Free flaps are commonly done by the Plastic Surgery Consultant. Interestingly 53.6% of the residents said Plastic surgery resident performed free flaps which showed a knowledge gap as a free flap is the most complex reconstructive soft tissue option and can only be performed by the Plastic Surgery Consultant.

Barriers to Ortho-plastic Approach

We wanted to find out from the residents what the biggest barriers to Ortho-plastic approach are. All our options were chosen as barriers namely availability of theatre space, lack of implants for bone fixation, lack of equipment for reconstruction, lack of appropriate dressing material, patient's financial constraints, lack of expertise and lack of a protocol for Ortho-plastic collaboration. Others mentioned included lack of good collaboration between orthopaedics and plastic surgery departments, delay in consultation and delayed response from plastic team. Our findings showed that the top barriers to the Ortho-plastic approach in management of patients with lower limb injuries were availability of theatre space and lack of a protocol for Ortho-plastic collaboration. This is partly like and partly unlike in the UK where Rymer *et al* conducted a two centre audit of adherence to the BAPRAS/BOA guidelines and found that one of the barriers was the referral system unlike our findings (11). The other barrier Rymer *et al* found was a plastic surgeon not being involved in the initial operation which is partly like in our setting where we found delay in consultation and lack of expertise were some of the barriers to Ortho-plastic approach. Nayagam *et al* described some of the obstacles to Ortho-plastic approach were training, demographics and professional interest (20).

STUDY STRENGTH

This study gives us an idea on the state of Ortho-plastic approach in the management of lower limb injuries at KNH. Since KNH is at the peak of the healthcare system in Kenya it also gives us an idea on the status of Ortho-plastic approach in the country. It is also the first of its kind in the country to the best of our knowledge.

STUDY LIMITATIONS

- The residents are at different levels of study which might impact the data on the knowledge and current practice in the management of lower limb injuries.
- Only one section of healthcare workers involved in the management of lower limb injuries were interviewed. We would need to interview consultants too to get their view as they are also key players in the Ortho-plastic approach.

CONCLUSION AND RECOMMENDATIONS

From our study we concluded that there exist a knowledge gap in the Ortho-plastic approach in the management of lower limb injuries at KNH. This can be addressed by organizing formal lectures and training workshops by both units of Plastic Surgery and Orthopaedic Surgery at UON and KNH.

There is also lack of a protocol for Ortho-plastic management of patients with lower limb injuries at KNH and this can be postulated as the reason for the gaps in patient management and knowledge. This can be addressed by formation of a taskforce that can come up with a protocol suited for our setting or the taskforce can come up with methods on how to adopt the BAPRAS/BOA guidelines. This will also need good will from the various stake holders namely the government and hospital management in employing staff and purchasing the equipment required. The units of Plastic Surgery and Orthopaedic Surgery working together to implement the protocol especially in training and having a dedicated Ortho-plastic teams.

The barrier of availability of theatre space can be addressed by the theatre users committee of the hospital and the management of the hospital to avail a dedicated theatre list and space as these patients form the bulk of the patients in the hospital requiring theatre. We have identified other barriers which can be easily solved by a protocol for Ortho-plastic Collaboration and both the Orthopaedics and Plastic Surgery teams working together to improve outcomes. All other stake holders need to be on board so that all equipment needed to actualize the Ortho-plastic approach are provided, these include implants, dressing material and insurance for the patients.

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APPENDICES

APPENDIX I: INFORMED CONSENT FORM ENGLISH VERSION

This informed consent has three parts:

I. Information sheet (to share information about the study with you).

II. Certificate of consent (for you to sign if you agree to participate in this study).

III. Statement by the researcher.

SECTION 1: INFORMATION SHEET

TITLE OF THE STUDY: EVALUATING THE KNOWLEDGE OF ORTHOPLASTIC APPROACH IN THE MANAGEMENT OF POST TRAUMATIC LOWER LIMB INJURIES IN KENYATTA NATIONAL HOSPITAL

INVESTIGATORS STATEMENT

My name is Dr. Aluora Kenneth Odongo; I am a postgraduate student at the University of Nairobi-Department of Surgery. I am conducting a study on evaluating the knowledge of Ortho-plastic approach in the management of post traumatic lower limb injuries in Kenyatta National Hospital. The purpose of this consent form is to enable you decide whether or not to participate in the study.

Please read through the form carefully and feel free to ask any questions or seek clarification about the study.

This study has been approved by the KNH/UON Ethic and Research Committee protocol No…….……

The investigator will be available to answer any questions that come up while filing the form and thereafter.

BRIEF DESCRIPTION OF THE STUDY

Ortho-plastic approach in management of lower limb injuries is where by Orthopaedic surgeons and Plastic surgeons collaborate to manage lower limb injuries where the

Orthopaedic Surgeon fixes the skeletal abnormality and the Plastic Surgeon reconstructs the soft tissue defect. This Ortho-plastic Approach is advocated for as it has shown better outcomes anywhere it has been implemented. Currently we are not at optimum in the management of lower limb injuries and the first step is to assess the knowledge of the Ortho-plastic Approach in order to determine how to implement the approach in our setup. This study will do so from the feedback we receive from your participation

PARTICIPATION IN THE STUDY

If you agree to participate in this study, you will be given a two part questionnaire to fill which will take about five minutes.

The questionnaire will cover knowledge and attitudes towards the surgical safety checklist and barriers to compliance.

The data collected will remain anonymous and will be analysed.

RISKS AND HARMS ASSOCIATED WITH THE STUDY

No risk or harm will come to you by participating in this study. No personal information will be collected and the data collected will remain anonymous and cannot be traced back to you.

BENEFIT OF PARTICIPATING IN THIS STUDY

The information you provide us with will help us better understand how improvement on the use of the surgical safety checklist can be done and thus improve patient safety.

QUESTIONS AND CHOICES

If you have any questions you can contact the primary investigator on the phone number and email addresses provided at the bottom of this page.

Your decision to participate in this study is completely voluntary. You are free to decline participation in the study and you can withdraw from the study at any time without injustice or loss of any benefits.

SECTION 2: CERTIFICATE OF CONSENT

PARTICIPANTS STATEMENT

I have read this consent form or had the information read to me. I have had my questions answered in a language that I understand. The risks and benefits of participating in this study have been explained to me. I understand that my participation in this study is voluntary and that I am free to withdraw anytime. I freely agree to participate in this research study.

Signature: ……

Date: ……

SECTION 3: RESEARCHERS STATEMENT

I, the undersigned have fully explained the relevant details of this research study to the participant and believe the participant has understood and has freely and willingly given his/her consent.

Researchers name: ……..

Signature: ……

Date: ……

For more information contact:

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0727270611

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Department of Surgery

University of Nairobi

APPENDIX II: INFORMED CONSENT FORM KISWAHILI VERSION
FOMU YA MAKUBALIANO YA KUSHIRIKI KATIKA UTAFITI

Fomu hii ya makubaliano ina sehemu tatu:

I. Ukurasa wa habari (kushiriki maelezo na wewe kuhusu utafiti huu).

II. Fomu ya makubaliano (ambayo utatia sahihi ukikubali kushiriki katika utafiti huu).

III. Ujumbe kutoka kwa mtafiti.

SEHEMU YA KWANZA: UKURASA WA HABARI

SWALA LA UTAFITI: BARRIERS TO COMPLIANCE WITH THE PRESCRIBED SURGICAL SAFETY CHECKLIST BY THEATRE USERS AT THE KENYATTA NATIONAL HOSPITAL OPEATING THEATRES

KITAMBULIZI KUTOKA KWA MTAFITI

Jina langu ni Dkt. Kenneth Odongo Aluora. Mimi ni daktari ninayesomea uzamili katika idara ya upasuaji chuo kikuu cha Nairobi.Ninafanya utafiti kwa anwani ya, “Evaluating the knowledge of orthoplastic approach in the management of post traumatic lower limb injuries in Kenyatta National Hospital”.

Nakuomba ushiriki katika utafitu huu.Fomu hii ni ya kukuwezesha kuamua ikiwa utashiriki katika utafiti huu au la.

Tafadhali soma fomu hii kwa makini na kisha una uhuru wa kuuliza swali lolote kuhusu utafiti huu.

Utafiti huu umepitishwa na KNH/UoN Ethics and Research Committee Nambari

……

Mtafiti mkuu atapatikana kujibu maswali yoyote yatakayo tokeza wakati wa kujaza fomu hii au baadaye.

MAELEZO MAFUPI KUHUSU UTAFITI

Orthoplastic Approach ni jinsi ya kutibu wagonjwa walioumia miguu kutokana na ajali. Wagonjwa hawa huwa wamevunjika mifupa na kupoteza nyama inayofunika mifupa hiyo. Ili kuwatibu wagonjwa hawa madaktari wa upasuaji wa mifupa na madaktari wa upasuaji wa kurekebisha wanashirikiana kujadiliana na kutumia ujuzi wao ili kumpa mgonjwa matubabu ya hali ya juu. Kushirikiana huku kumeonyesha matokeo bora zaidi katika hospitali na nchi zilizochukua mtindo huu wa matibabu. Ilikuweza kutekeza njia hii ya kuwatibu tunafanya utafiti kupata kujua kiwango ya kuelewa njia hii ni gani ilitujue jinsi tutaanza kutekeleza njia hii katika hospitali yetu. Kushiriki kwako katika utafiti huu utaweza kutupa majibu na kutuelekeza jinsi ya kutekeleza njia hii ya matibabu.

KUSHIRIKI KATIKA UTAFITI

Ukikubali kushiriki katika utafiti huu, utapatiwa fomu ya kujaza ambayo ina sehemu mbili za kujaza na itakuchukua muda wa dakika tano tu kujaza.

Fomu hii inahusu ujuzi na mtazamo wa kifaa hiki na vizuizi vya utumizi.

Ujumbe utakao tupa utahifadhiwa kwa siri na kufanyiwa uchambuzi.

HATARI YA KUSHIRIKI KATIKA UTAFITI

Hakuna hatari au madhara yoyote utakayopata kwa kushiriki katika utafiti huu.Hakuna maelezo ya kibinafsi ambayo tutahitaji kutoka kwako.Maelezo utakayo tupa yatahifadhiwa kwa siri na hayawezi kufuatiliwa kwako baadaye.

FAIDA YA KUSHIRIKI KATIKA UTAFITI

Ujumbe utakaotupa utatusaidia kuelewa vyema njia ambazo zaweza kutumika kuboresha utumizi wa kifaa hiki na hivyo basi kusalimisha maisha ya wagonjwa wakati wa upasuaji.

MASWALI NA MACHAGUZI

Ukiwa na maswali yoyote unaweza kuwasiliana na mtafiti mkuu kupitia kwa nambari ya simu na barua pepe zilizo katika mwisho wa ukurasa huu.

Uamuzi wako wa kushiriki katika utafiti huu ni kwa hiari yako.Una uhuru wa kukataa kushiriki katika utafiti na una haki ya kujiondoa wakati wowote unapoamua bila kupoteza haki na faida yako.

SEHEMU YA PILI: FOMU YA MAKUBALIANO

UJUMBE KUTOKA KWA MSHIRIKA

Nimesoma fomu hii ya makubaliano kwa kina au nimesomewa fomu hii.Maswali yangu yamejibiwa kwa lugha ambayo naelewa.Nimeelezewa kwa kina madhara na faida ya kushiriki katika utafiti huu.Naelewa kuwa kushiriki katika utafiti huu ni kwa hiari yangu na nina uhuru wa kujiondoa wakati wowote.

Nakubali kushiriki katika utafiti huu.

Sahihi:

……

Tarehe:

……...

SEHEMU YA TATU: UJUMBE KUTOKA KWA MTAFITI

Nathibitisha kuwa nimemweleza kwa kina mshiriki kuhusu utafiti huu na naamini ya kwamba mshiriki ameelewa na amekubali kwa hiari yake kutia sahihi makubaliano haya.

Jina la
mtafiti:…….

Sahihi:……

Tarehe:……

Kwa maelezo zaidi wasiliana na:

Dkt. Aluora Kenneth Odongo

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Department of Surgery

University of Nairobi

APPENDIX III: DATA COLLECTION FORM

EVALUATING THE KNOWLEDGE OF ORTHOPLASTIC APPROACH IN THE MANAGEMENT OF POST TRAUMATIC LOWER LIMB INJURIES IN KENYATTA NATIONAL HOSPITAL

Study code: _____

Instructions: Please circle the appropriate choice or tick the check box as suitable

Cadre: M Med. Orthopaedic Surgery Resident ☐

M Med Plastic Surgery Resident ☐

M Med General Surgery Resident ☐

Other Specify: _____

Year of study: _____

1) How long was your rotation in Ortho-paedics Surgery?

   1 month ☐

   3 months ☐

   >3 months ☐

   No rotation ☐

2) How long was your rotation in Plastic Surgery?

   1 month ☐

   3 months ☐

   >3 months ☐

   No rotation ☐

3) Do you have knowledge of existence of any Ortho-plastic protocol?

   Yes ☐

   No ☐

4) If **Yes** in **Question 3** above which protocol? (Skip if **NO** in **Question 3)**

_____

_____

_____

_____

5) If **Yes** in **Question 1** above, which protocol do you use among your listed protocols in **Question 2** above? (Skip in **NO** in **Question 1**)

_____

_____

6) What classification system do you use for compound fractures?
    a. Gustilo and Anderson Classification system
    b. AO System
    c. Ganga Hospital
    d. Other (State): _____
7) Who classifies compound fracture in your practice?
    a. Admitting doctor at casualty
    b. Orthopedic Resident
    c. Plastic Surgery resident
    d. Orthopedic consultant
    e. Plastic surgery consultant
8) Based on your knowledge who should classify compound fractures?
    a. Admitting doctor at casualty
    b. Orthopedic Resident
    c. Plastic Surgery resident
    d. Orthopedic consultant
    e. Plastic surgery consultant
9) At what point in patient management are compound fractures classified in your practice?
    a. At admission
    b. Day 1 after admission
    c. At 1st debridement
    d. At 2nd debridement
    e. Other (Specify):_____

10) Based on your knowledge at what point in patient management should compound fractures be classified?
    a. At admission
    b. Day 1 after admission
    c. At 1st debridement
    d. At 2nd debridement
    e. Other (Specify):_____
11) What is the indication for Ortho-plastic consultation in your practice?
    a. Gustillo Anderson 1
    b. Gustillo Anderson 2
    c. Gustillo Anderson 3A
    d. Gustillo Anderson 3B
    e. Gustillo Anderson 3C
    f. Any compound fracture
    g. Following 1st debridement of a wound not amenable to primary closure
    h. Wound that is clean with good granulation tissue not amenable to primary closure
    i. Compound fracture that is ready for reconstruction with a flap
    j. Consultants' recommendation
    k. Others (Specify): _____
12) What is the timeline to the first debridement following admission of a patient with compound fracture in your practice at KNH?
    a. Within 12 hours
    b. 12 – 24 hours
    c. 24 – 72 hours
    d. 3 – 7 days
    e. More than 7 days
    f. Other (Specify):_____
13) Based on your knowledge what should be the timeline to the first debridement following admission of a patient with compound fracture?
    a. Within 12 hours
    b. 12 – 24 hours
    c. 24 – 72 hours
    d. 3 – 7 days
    e. More than 7 days

f. Other (Specify):_____

14) Who performs the first debridement of a compound fracture in your practice at KNH?
    a. Ortho-paedics resident
    b. Plastic surgery resident
    c. Ortho-paedic and Plastic surgery resident
    d. Consultant Ortho-paedics
    e. Consultant Plastic Surgery
    f. Ortho-paedic and Plastic Surgery Consultant
    g. Other (Specify):_____

15) Based on your knowledge, who should perform the first debridement of a compound fracture in your practice at KNH?
    a. Ortho-paedics resident
    b. Plastic surgery resident
    c. Ortho-paedic and Plastic surgery resident
    d. Consultant Ortho-paedics
    e. Consultant Plastic Surgery
    f. Ortho-paedic and Plastic Surgery Consultant
    g. Other (Specify):_____

16) How many times on average do you debride compound fractures before definitive fixation and soft tissue reconstruction?

    1 2 3 4 5 >5

17) What criterion is used to determine a wound has been adequately debrided?
    a. Bacterial load
    b. Lack of pus
    c. Lack of necrotic tissue
    d. Good granulation tissue
    e. Other (Specify):_____

18) Based on your knowledge what criterion should be used to determine a wound has been adequately debrided?
    a. Bacterial load
    b. Lack of pus
    c. Lack of necrotic tissue
    d. Good granulation tissue
    e. Other (Specify):_____

19) At what point does the first plastic surgery consultation occur?

a. After 1st debridement
b. After 2nd debridement
c. After 3rd debridement
d. After 4th debridement
e. When the wound is clean irrespective of reconstruction option required
f. When the wound requires flap closure
g. Others(Specify):_____

20) Approximately how many weeks following injury does fixation of bone occur?

<1 1 2 3 4 5 >5

21) Based on your knowledge approximately how many weeks following injury should fixation of bone occur?

<1 1 2 3 4 5 >5

22) When is soft tissue reconstruction performed in your practice at KNH?

a. During fixation of an external fixator
b. Within a week after external fixation
c. Within 2 weeks after external fixation
d. Within 3 weeks of external fixation
e. More than 3 weeks after external fixation

23) Based on your knowledge, when should soft tissue reconstruction be performed?

a. During fixation of an external fixator
b. Within a week after external fixation
c. Within 2 weeks after external fixation
d. Within 3 weeks of external fixation
e. More than 3 weeks after external fixation

24) How often do you do internal fixation and soft tissue reconstruction in your practice

a. Never
b. Sometimes
c. Most of the times
d. Always

25) Who does what soft tissue reconstruction? (Tick appropriately)

	Ortho-paedics Resident	Plastic Surgery Resident	Ortho-paedics Consultant	Plastic surgery Consultant
Primary Closure				
Split thickness skin graft				
Vacuum dressing				
Local Flap				
Regional Flap				
Free Flap				

26) What are the top three challenges in Ortho-plastic collaboration? (Indicate 1,2,3 on the answer 1 being the biggest and 3 being the 3rd biggest challenge)

a. Availability of theatre space
b. Lack of implants for bone fixation
c. Lack of equipment for reconstruction
d. Lack of appropriate dressing material
e. Patient's financial constraints
f. Lack of expertise
g. Lack of a protocol for Ortho-plastic collaboration
h. Others: (Specify):_____

27) Which clinic is a patient with compound fracture discharged through upon discharge in your practice at KNH?

a. Ortho-paedics Clinic
b. Plastic Surgery Clinic
c. Both