

**Figure 7: Caesarean section complications**

## 6.4. CROSS TABULATION OF PYREXIA WITH OTHER VARIABLES

### 6.4.1. Number of days Post C/S Vs Pyrexia

Most patients developed pyrexia on the second day (31.1 percent) as shown in figure 8.

### 6.4.2. Age distribution in relation to pyrexia

No significant association between age and pyrexia was observed (p value =0.867). Figure 9 shows the patients who developed pyrexia in relation to their age groups.

6.4.3. The level of education in relation to pyrexia

The level of education was not significantly associated with pyrexia (p value=0.094). However, patients who had primary education or none at all were more likely to develop pyrexia than the others. Figure 10 compares the patients' level of education and the development of pyrexia.

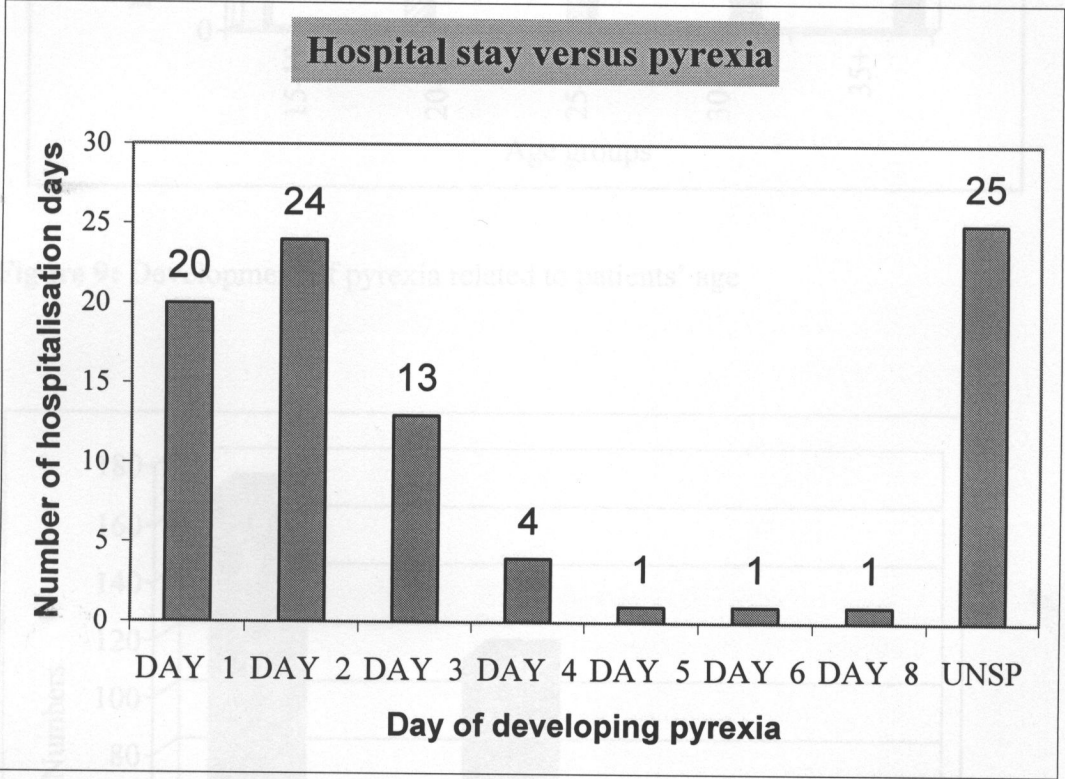
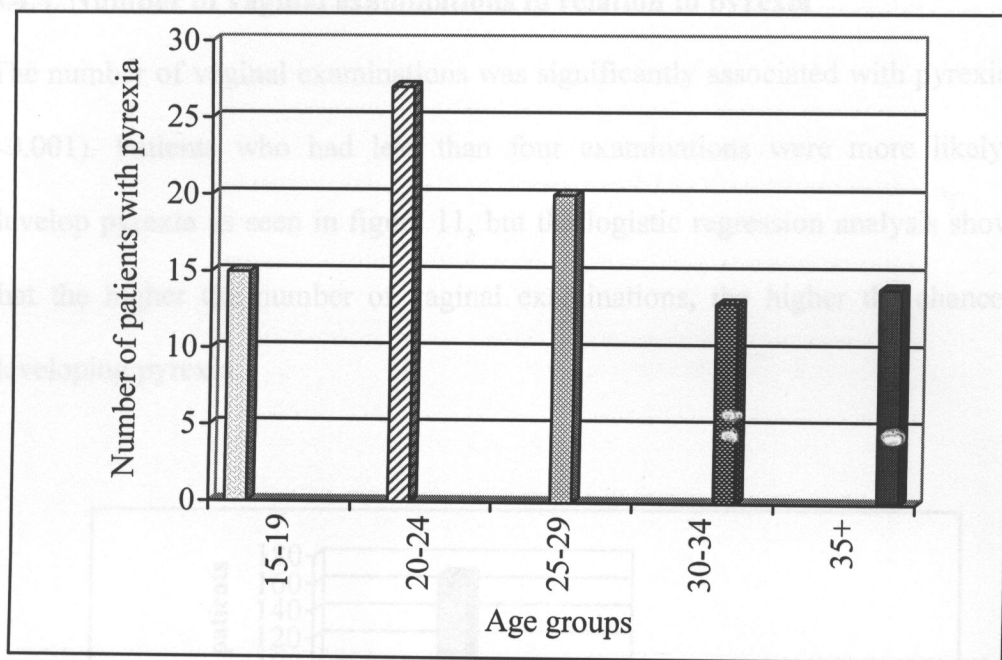
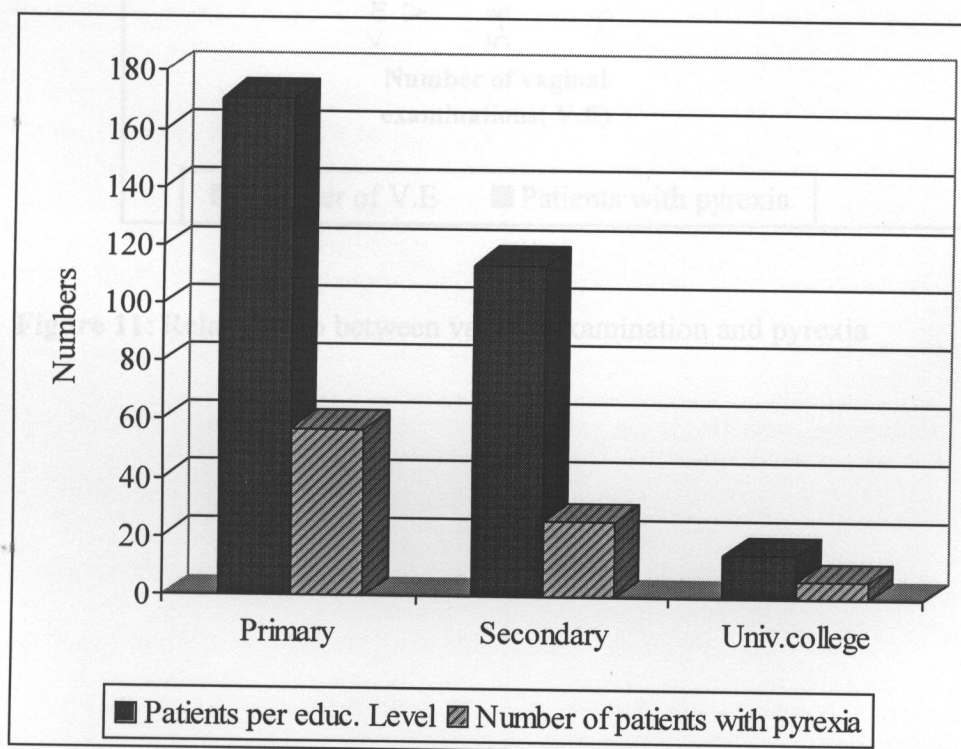


Figure 8: Day of hospital stay on which patients developed pyrexia



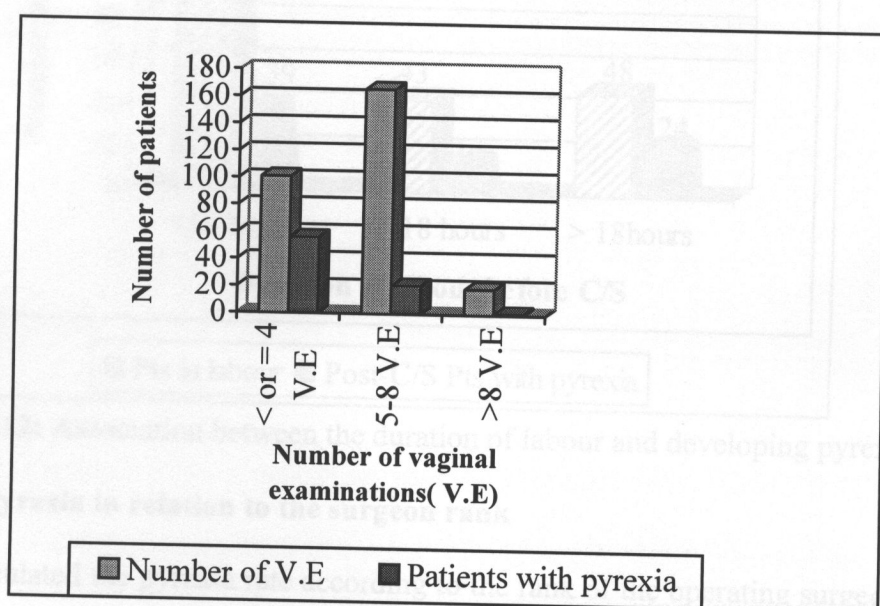
**Figure 9:** Development of pyrexia related to patients' age



**Figure 10:** Pyrexia related to the patients' level of education

#### 6.4.4. Number of vaginal examinations in relation to pyrexia

The number of vaginal examinations was significantly associated with pyrexia ( $p < 0.001$ ). Patients who had less than four examinations were more likely to develop pyrexia as seen in figure 11, but the logistic regression analysis showed that the higher the number of vaginal examinations, the higher the chance of developing pyrexia.



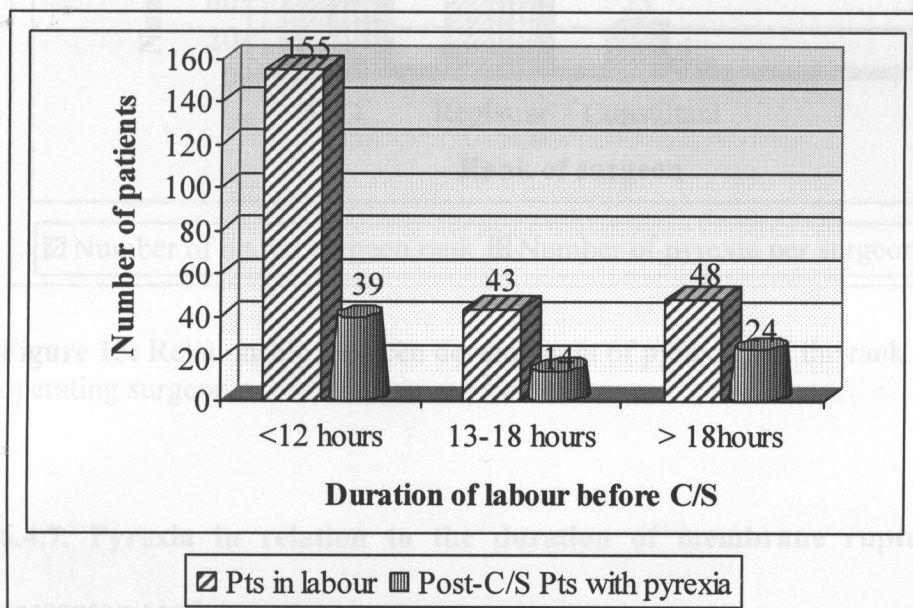
**Figure 11:** Relationship between vaginal examination and pyrexia



#### 6.4.5. Pyrexia in relation to the duration of labour

Patients who spent less than 12 hours in labour were less likely to have pyrexia.

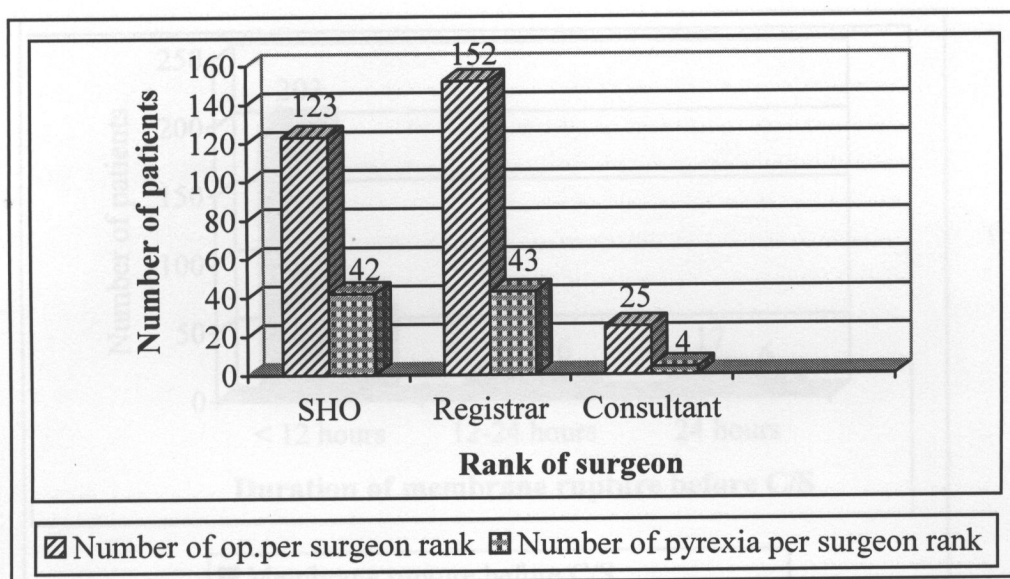
There was a significant association between duration of labour and pyrexia (p value=0.005). Figure 12 portrays that association



**Figure 12:** Association between the duration of labour and developing pyrexia

#### 6.4.6. Pyrexia in relation to the surgeon rank

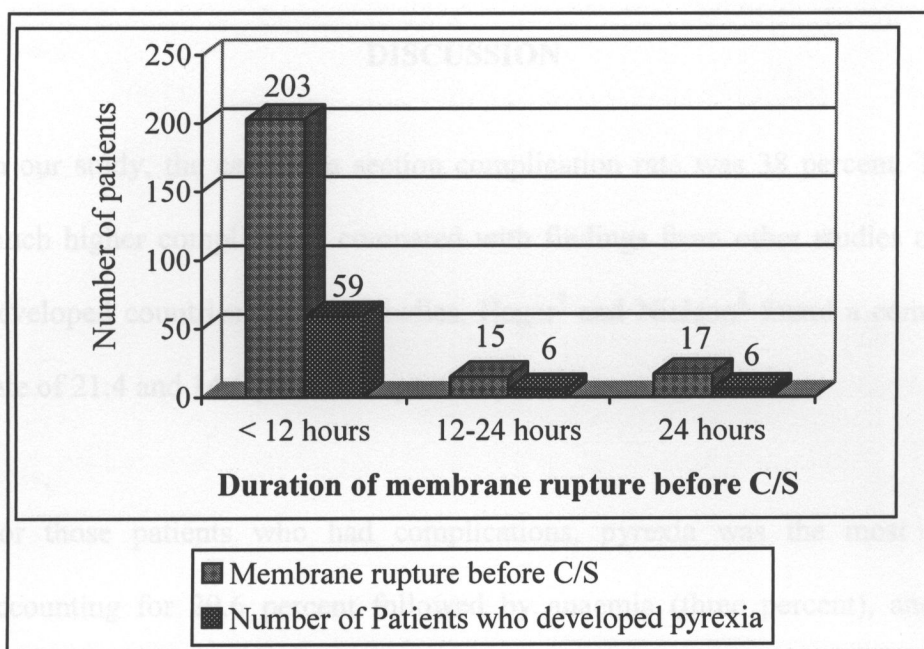
We calculated the pyrexia rate according to the rank of the operating surgeon and found that pyrexia was present in 34.1 percent of patients operated on by SHOs, 28.2 percent in those operated on by registrars and 16.0 percent in patients operated by consultants. However, there was no significant association between the rank of surgeon who operated and the pyrexia in operated patients (p value =0.169). Figure 13 compares the number of operations carried per rank of surgeons and the number of patients who developed pyrexia.



**Figure 13:** Relationship between development of pyrexia and the rank of the operating surgeon

#### 6.4.7. Pyrexia in relation to the duration of membrane rupture before caesarean section

No significant association was found with the length of time the membranes were ruptured and the development of pyrexia ( $p$  value =0.601). Figure 14 shows the relationship between the duration of membrane rupture before C/S and the development of pyrexia.



**Figure 14:** Pyrexia and patients who had rupture of membranes before caesarian section

## RESULTS OF MULTIVARIATE ANALYSIS

All variables that were significant at 10 percent were put in the model. Patients with less than four vaginal examinations were 36 percent (OR =0.64, 95% CI 0.45, 0.91) and were less likely to have pyrexia.

Patients with primary or no education were 40 percent of the studied population (OR 1.40,95% CI 1.05, 1.87) and more likely to have had pyrexia.

There was a strong association between the duration of labour before the caesarean section was carried out and the development of pyrexia ( $p<0.005$ ).

## DISCUSSION

In our study, the caesarean section complication rate was 38 percent. This, is a much higher complication compared with findings from other studies carried in developed countries. In their studies, Hager<sup>7</sup> and Nielson<sup>8</sup> found a complication rate of 21.4 and 14.5 percent respectively.

For those patients who had complications, pyrexia was the most common accounting for 29.6 percent followed by anaemia (three percent), and wound infection (2.3 percent). Compared to other studies the incidence of wound infection was quite low. Vermillion<sup>11</sup> found an incidence of 6.6 percent while Phiri 12.5 percent<sup>12</sup>. This reflects positively and overemphasizes the value of the current practices in UTH regarding the prophylactic measures taken to prevent postoperative wound sepsis.

Factors that predispose to post operative morbidity are quite varied across the different studies. In this study three factors were associated with development of pyrexia, the most common complication. These were:

- i. Socio economic status as evidenced by level of education (p value <0.094)
- ii. Number of hours spend in labour prior to caesarean section (p value < 0.005)



- iii. Number of vaginal examinations prior to caesarean section (p value <0.001). Anaemia and obesity were contributing factors in the other studies.

The level of education may be a poor proxy of social economic status because merely having no education does not necessarily mean that one is coming from a poor background. Pyrexia in this study was associated with clients who had no education or only primary education, although this was not a significant finding.

The number of hours spent in labour prior to caesarean section, as affecting post caesarean morbidity was a consistent finding with other studies<sup>13</sup>. Using logical regression analysis, it was shown that patients who spent less than twelve hours in labour appeared to be less likely to develop pyrexia (p value =0.005).

The number of vaginal examinations prior to caesarean section was only apparently significant after the logistic regression analysis was done (p value < 0.001). This finding concurs with other studies which showed that the greater the number of vaginal examinations, the higher the rate of postoperative sepsis<sup>13,18</sup>. In active phase of labour, where labour is progressing well, it is expected that a woman who is being monitored by a partograph will not have more than four vaginal examinations before she delivers. In the UTH Lusaka every labour is monitored by a partograph. This is also true to some extent, of the deliveries conducted in the urban clinics referring patients to UTH hence the finding that the majority had five to eight vaginal examinations.

At variance with other studies, we found that prolonged rupture of membranes did not appear to be significantly related to the development of pyrexia (p value <0.601). However, Vermillion<sup>11</sup> had similar findings in his study as well. We cannot explain the reason for such a finding but one could suspect the size of our study sample.

Factors that were statistically significantly associated with developing complications and more specifically pyrexia, were the length of time spent in labour before caesarean section and the number of vaginal examinations

## CONCLUSION

This study, which aimed at determining the risk factors associated with post-caesarean section complications at the University Teaching Hospital Lusaka, showed that the number of vaginal examinations was a high risk for post-caesarean pyrexia. This was evident when the digital vaginal examination was done more than four times before surgery ( $p < 0.001$ ). In addition, duration of labour before caesarean section is found to impact the development of pyrexia. There is significant association between the labour lasting for 13 hours or more before caesarean section and the development of post-C/S pyrexia ( $p$  value = 0.005).

The prolonged duration of ruptured amniotic membranes appears not to be a risk factor for pyrexia contrary to what most other studies showed before.

This study finally shows that the caesarean complication rate at the University Teaching hospital Lusaka is 38 percent. This is a comparatively high incidence.

Pyrexia was the most common post-caesarean complication accounting for 78.0 of all complications. Anaemia as post-C/S complication is found in eight percent of patients while surgical site infection is encountered in six percent of all the post C/S patients with complications. Paralytic ileus as a post C/S complication is seen in two percent while six percent of the remaining patients have a variety of single or combined post- C/S complications.

## RECOMMENDATIONS

1. Infection prevention measures should be observed in order to reduce post caesarean morbidity. Guidelines have been written but few are available in labour ward. Health workers should be informed about the latter and provided with the required material to prevent infection.
2. Water is a rare commodity during the night in theater and labour ward yet scrubbing and hand washing are simple measures to prevent infection. The institution should make water available in labour ward and theater 24 hours a day. The practice of weekly scrubbing and spraying of the two wards should continue.
3. Labour ward should ensure that unnecessary traffic passing through it is reduced. Only members of staff working on the labour ward that day and on call should pass through and it should not be used as a thorough fare.
4. There should be strict adherence to the partograph and all new incoming staff should be trained in the proper use of the partograph. The use of the partograph should be spread to the urban clinics and other health facilities with delivery services. Patients in the peripheral clinics should be referred when the 'alert line' is crossed. Guidelines on the use of the partograph should be made available to the peripheral clinics.



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## **APPENDIX 1**

### **EXTENT OF POST CAESAREAN SECTION COMPLICATIONS AT UTH INFORMATION SHEET**

1. This is a study aiming at determining the extent of post caesarean complications at University Teaching Hospital.
2. It is thought that this study will shade more light to risk factors for different complications of delivery by cesarean section at the UTH Lusaka, this will be instrumental in instituting at the departmental or hospital level policies aiming at preventing or reducing cesarean section complications.
3. The study will be conducted over a five-month period, beginning from March 2005 through to July 2005.
4. Every patient delivered by caesarean section during the period extending from March 1, 2005 to May 31, 2005 will be approached within 24hours before or 5 hours after the operation, given enough information regarding the study and be recruited into the study.
5. A written consent to be included in the study will be given by any person accepting to participate
6. After obtaining an informed consent, demographic data, past and current medical history, past surgical history, information surrounding labour and post- operative well-being will be collected from the study participant.



7. While still in the hospital, each study participant will be reviewed on a daily basis by the investigator doctor.

The purpose for those daily reviews will be to try and detect any possible complications. To facilitate that, the patient will be asked questions regarding her well being, body temperature monitored, examined, haemoglobin level check where anaemia will be suspected, pus swab and blood culture will be done in case of overt infection.

After discharge from the hospital, each participant will be required to come for review a week later and 6 weeks after the delivery.

1. Taking part in this study does not expose the participant to any risk at all.
2. Participation in this study is voluntary and one might chose to withdraw without suffering any penalty or losing any of the patient's rights: receiving medical care.
3. Agreement to take part in this study does not place any obligation to the investigator or the hospital authorities other than that due to any other patient at the hospital.
4. A participant to the study will be free to come back to the contact doctors any time she has any operation related problem within the period she will be in the study.
5. Should any cesarean section related complication(s) occur(s), study participants will be offered treatment according to the UTH care standards.

6. Records will be identified by a study number not by the participant's name; the two will be unlinked in order to safeguard confidentiality. The information provided by participants will not be used for their detriment. Their names will not be used in any report.
7. Benefits associated with participation in the study: Participants in the study will enjoy the following advantages:
  - A. Being closely monitored on a daily basis from the day of the operation (cesarean section) till the day they are discharged from the hospital.
  - B. Prompt management of the complication(s) if practical.
8. The study final report will be accessible in the event one might be interested to know the study results.

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## APPENDIX II

### CONSENT FORM

You have received clear explanations on this study of extent of post-caesarean section complications at UTH. You understand that:

1. The aim of the study is to determine the extent of post caesarean complications at University Teaching Hospital.
2. Demographic information, past and current medical history, past surgical history, information surrounding labour and post- operative well-being will be collected from you by the investigating doctor.
3. While in the hospital you will be seen by the investigating doctor on a daily basis. You will be requested to come back for postnatal review one week after hospital discharge and at six weeks after the caesarean section.
4. The purpose for those daily reviews is to try and detect any possible operation complications. To facilitate that, you will be asked questions regarding your well being, your body temperature monitored, you will be examined, your haemoglobin level checked when anaemia would be suspected, pus swab and blood culture will be done in case of overt infection.
5. Should any cesarean section related complication(s) occur(s), you will be offered treatment according to the UTH care standards.
6. The time you will spend in this study is not greater than six weeks.
7. Taking part in this study does not expose you to any risk at all.

8. Agreement to take part in this study does not place any obligation to the investigator or the hospital authorities other than that due to any other patient at the hospital.
9. Participation in this study is voluntary and you might chose to withdraw without suffering any penalty or losing any of the patient's rights: receiving medical care.
10. You are free to come back to the contact doctors any time you have any operation related problem within the period you will be in the study.
11. Your records will be identified by a study number not by your name; the two will be unlinked in order to safeguard your confidentiality. The information you provide will not be used for your detriment. Your name will not be used in any report.
12. There are benefits associated with participation in this study like: being closely monitored on a daily basis from the day of the operation (cesarean section) till the day they are discharged from the hospital, prompt management of the complication(s) if practical.
13. The study final report will be accessible in the event you might be interested to know the study results.
14. The names of the contact doctors have been given to you

Name of study participant: .....

Signed:.....

Date:.....

Witness:.....

Date:.....



### APPENDIX III

#### EXTENT OF POST CAESAREAN SECTION COMPLICATIONS AT UTH QUESTIONNAIRE

1. Patient's Study No.....
1. Address :.....
2. Phone.....
4. Email.....
3. Date of Birth.....
4. Age.....
5. Marital status: .....1 = Married, 2 = Single, 3 = Divorced.
6. Last Menstrual Period...../...../.....
7. Gestational age:...
8. EDD.....
9. Weight.....kg.
10. Educational Level:.....1 = Primary, 2 = Secondary, 3 = University/College
11. Parity:.....1 = 0 – 3, 2 = 4 – 5, 3 = > 6
12. Reason for referral.....
13. Time of Referral.....
14. Referral facility.....
15. Time of Arrival.....
17. Current Medical Condition.....
18. Past Medical illness.....

19. Duration of labour before C/S:.....1 = < 12hrs, 2 = 13 – 18hrs, 3 = > 18 hrs
20. Number of V/Es before C/S:....1=< 4, 2 = 5 – 8, 3 => 8
21. Period between rupture of membranes and C/S:.....1 = < 12 hrs,  
2 = 12 – 24 hours, 3 => 24 hours
22. Presentation before C/S: .....1 = Cephalic, 2 = Breech, 3 = Cord,  
4 = Hand, 5= Shoulder
23. Colour:.....1 = Clear, 2 = Purulent, 3 = Bloody, 4 = Meconium
24. Smell of liquor before C/S:.....1 = Normal, 2 = Foul
25. Indication for C/S: .....
26. Rank of Surgeon:.....1 = JRMO, 2 = SHO, 3 = Registrar,  
4 = Senior Registrar, 5 = Consultant
27. Date, Time decision made for C/S.....
28. Time of skin incision.....
29. Type of skin incision.....
30. Type of incision on the uterus.....
31. Time end of operation.....
32. Blood loss during O.T:.....1 = < 500mls, 2 = 500 – 1000mls  
3 =>1000mls

## POST OP CONDITIONS

1.	Pyrexia (Temp > 37.5°C):	Yes	No
2.	Anaemia (Hb <11.0g/dl):	Yes	No
3.	If answer to 2 is yes, patient transfused:	Yes	No
4.	Infected wound (Presence of Pus)	Yes	No
5.	UTI	Yes	No
6.	Paralytic ileus	Yes	No
7.	Endometritis	Yes	No
8.	Abdominal wall abscess	Yes	No
9.	Pelvic Abscess	Yes	No
10.	Wound dehiscence (bowel exposed)	Yes	No
11.	Deep venous Thrombosis	Yes	No
12.	Mastitis	Yes	No
13.	Received antibiotics	Yes	No
15.	Type of antibiotics.....		
16.	Post OP Antibiotics.....		
17.	Duration of treatment.....		
18.	Duration of stay.....		
19.	Condition on discharge.....		

### Follow up

20. *Condition one week after discharge.....*
21. *Any complication before end of Puerperium.....*
22. *Condition 6 weeks after C/S.....*