

DISSERTATION

**USE OF THE PARTOGRAPH AND OBSTETRIC  
OUTCOMES IN KAJIADO DISTRICT HOSPITAL**

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*This dissertation is submitted in partial fulfillment for the degree of master of  
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**DECLARATION**

This is to certify that the dissertation herein is my original work and no other similar study has been done in the same institution.

Signature.....        *Bor*        .....

Date.....        07/01/2010        .....

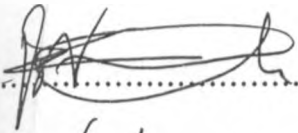
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## CERTIFICATE OF SUPERVISION

This is to certify that Dr. R. K. Bor researched upon this dissertation under my guidance and supervision and that this book is submitted with my approval.

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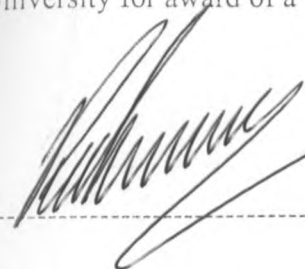
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## CERTIFICATE OF AUTHENTICITY

This is to certify that this dissertation is the original work of Dr Richard Bor M. Med student registration number H58/7748/06 in Obstetrics and Gynaecology department, University of Nairobi (2006-2010). The research was carried out in the department of obstetrics and gynaecology, school of medicine, college of health sciences. It has not been presented in any other University for award of a degree.

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## DEDICATION

This book is dedicated to my wife Priscilla, my children Cheruto, Chebet and Chepchumba whose love and support has made my work enjoyable.

To William, we fondly remember and deeply miss you.

## ACKNOWLEDGEMENT

I am grateful to the ministry of health for having granted me the scholarship to train in Obstetrics and Gynecology at the University of Nairobi with the aim of improving the health of women in our community.

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I wish to appreciate the administration of Kajiado district hospital for allowing me to collect data in their maternity and records departments

## Definitions

**Skilled attendant** – is defined by World Health Organization (WHO) as a health professional such as a medical doctor, clinical officer or nurse- who has been educated and trained to proficiency in the skills needed to manage normal pregnancies, childbirth, and the immediate post partum period, and in the identification, management and referral of complications in women and newborns(3).

**Maternal death** – is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes (14).

**Quality maternal care** – encompasses provision of a minimum level of care to all pregnant women and their new born babies, and higher level of care to those who need it; obtaining the best possible medical outcome of mother and baby; providing care which satisfies users and providers and maintaining sound managerial and financial performance(3).

**Maternal mortality Ratio (MMR):** is the number of maternal deaths that result from the reproductive process per 100,000 live births.

**Perinatal Mortality rate** – Still births and neonatal deaths within seven days of birth per 1000 total births in a given year.

**Maternal morbidity** – it is injury to the mother during pregnancy, labor and after delivery e.g. obstetric fistula.



## ABBREVIATIONS

ANC – Ante Natal Care

CS – Caesarean Section

B/P- Blood Pressure

DHMB – District Health Management Board

DHMT – District Health Management Team

EOC – Essential Obstetric care

FIGO- International Federation of Obstetrics and Gynecology

FHR- Fetal Heart Rate

FP – Family Planning

FSB- Fresh Still Birth

GOK - Government of Kenya

HIV – Human Immunodeficiency Virus

ICPD - International Conference on Population and Development

IP - Infection Prevention

KSPA- Kenya Service Provision Assessment

KDHS – Kenya Demographic and Health Survey

KOGS – Kenya Obstetrical and Gynecological Society

MCH – Maternal and Child Health

MDGs- Millennium Development Goals

MMR – Maternal Mortality Ratio

MoH – Ministry of Health

NRHS – National Reproductive Health Strategy

Ngo – Non Governmental Organizations

OBS/GYN – Obstetric and Gynecology

PPH-Post Partum Hemorrhage

PNC – Post Natal care

SMI – Safe Motherhood Initiative

TBA – Traditional Birth Attendant

UNICEF – United Nations Children’s Fund

UON – University of Nairobi

WHO-World Health Organization

## ABSTRACT

**Background:** One of the key challenges in the health care provision in Kenya today is the high maternal and perinatal morbidity and mortality. The partograph – document used to monitor individual woman's labor is promoted internationally as a means for improving quality of care by helping providers take appropriate and timely decisions based on the progress of labor, maternal condition and fetal condition at every stage. Studies so far have shown a generally low level of utilization of the partograph and a marked regional and hospital to hospital variation in the use of the partograph.

**Objective:** The main objective of this study was to assess the quality of intrapartum care and obstetric outcomes in Kajiado district hospital.

**Design:** A retrospective cohort study was conducted comparing the quality of intrapartum care and obstetric outcomes in women managed by use of the partograph (exposed) and those who were managed without its use (unexposed).

**Setting:** Medical records department, Kajiado district hospital

**Results:** A total of 207 files were reviewed beginning 1<sup>st</sup> July, 07 to 20 October 2007. Out of this 74 (37%) of the women were managed by partograph and 116 (55%) were managed without. Another 17 (8.2%) of the files were excluded. The socio-demographic as well as maternal condition at admission revealed that the groups were well matched with no significant differences. However there were more teenage women delivering i.e. 29% which is higher than the national average which stands at 23 % (5). The frequency of monitoring of maternal condition was significantly different – with 82.3% of the exposed group having blood pressure measured as opposed to 58.2% among the unexposed ( $P=0.05$ ). Measurements of maternal pulse revealed a significant variation between the groups. Among the exposed 89% had pulse measurements recorded once or more compared to 11.3% of the unexposed ( $P=0.00$ ).

Fetal heart rate was assessed half hourly in 22.9% among the exposed as compared to 1.2% of the unexposed (RR3.1, 95% C.I. 2.2-4.2,  $P=0.000$ ). For similar duration of labor fetal heart rate was measured 6.8 times among the exposed and only 2.8 times in the unexposed group. Assessment of strength and number of uterine contraction was done in 70 (94.5%) of the exposed compared to none among the unexposed ( $PP=000$ ). Urinalysis, maternal pulse and state of liquor were the least recorded parameters.

The rate of augmentation remained similar in both groups at 22% (exposed) and 19% (unexposed). However when the tracing crossed the action line in the exposed group, intervention by caesarean section went up threefold, from 8.1% to 25% (RR2.8, 95%CI.1.1-4, P=0.049). Duration of labor at the hospital was comparable with a mean of 6.1 and 6.8 hours among exposed and unexposed women respectively (Chi-sq0.339, P=0.952). Prolonged labor (>18hrs) was twice more likely to occur in unexposed (3.7%) than exposed (1.3%) but this was not statistically significant. Modes of delivery in both groups were comparable with the rate of caesarian at 14.4% and 11.4% among the exposed and unexposed respectively (Chi-sq1.07, P=0.591). Use of oxytocics in 3<sup>rd</sup> stage stood at 63.5% and 45.5% among exposed and unexposed respectively (RR 1.9, 95%CI.1.0-3.4, P=0.026). Outcomes of labor were favorable for the majority of the women and their infants with no significant differences between the two groups.

## **CONCLUSION**

There is low utilization of partograph at Kajiado district hospital. Accurate recording of the parameters to monitor the mother, the fetus and progress of labor as recommended were mostly not done. Whenever it was used the partograph significantly influenced the frequency of monitoring of maternal and fetal condition as well as progress of labor.

## **RECOMMENDATION**

There is need for continuous medical education and on job training of all those involved in management of labor with a view to ensuring universal use of partograph for women in labor.

# 1.0 INTRODUCTION AND LITERATURE REVIEW

Complications of pregnancy and childbirth are among the leading causes of death and disability among women of reproductive age in developing countries and remain a major public health issue (1, 2). Lack of skilled attendants at birth contributes significantly to maternal and perinatal morbidity and mortality. Provision of quality delivery care for all women and provision of skilled attendants at birth together with functional referral systems are interventions that must be available and accessible to reduce maternal and perinatal morbidity and mortality.

Studies done in various parts of Kenya have shown increasing uptake of antenatal services. The Kenya Demographic and Health Survey (KDHS) 2003 (4) reported that 88% of pregnant women in Kenya receive antenatal care at least once from either doctors (18%) or nurses (70%). A small fraction (2%) receives ANC from traditional birth attendants, while 10% do not receive any antenatal care. However, maternal mortality has not reduced significantly despite trends towards more prenatal care (5). This indicates that ANC attendance alone does not always result in the expected outcome. Quality ANC should be promoted along with quality intrapartum care, and attendance by skilled health care providers for the ultimate goal of reducing maternal mortality to be attained (6,7). This is a huge challenge in Kenya because majority of deliveries occur at home. Forty per cent of Kenyan women deliver in a health facility, while 59% are delivered at home (4).

Ministry of Health should not only set policy, standards and guidelines, but should ensure that these are universally known, referenced and integrated into service. The system therefore, should provide adequate organizational support and training to ensure that each care giver can offer quality services.

Maternal mortality remains unacceptably high across much of the developing world. In 2005, more than 500,000 women died during pregnancy, childbirth or in six weeks after delivery. In sub Saharan Africa, a woman's risk of dying from treatable or preventable complications of pregnancy is 1 in 22 compared with 1 in 7300 in developed nations. For all countries with data there was a decrease of 2.5% per year in MMR between 1990 and 2005. There was however no

evidence of significant reduction in MMR in sub-Saharan Africa for the same period (44). KDHS 2003(4) put Kenya's MMR at 414 per 100,000 live births which compares poorly with Swedish maternal death rate of 0.2/100,000 live births (10). Malawi reported MMR at 1120/100,000 live births in the year 2000(11).

In 1994 Kenya was among the 179 countries which endorsed the program of action of United Nations International Conference on Population and Development (ICPD) in Cairo (12). Member states were asked to take all appropriate measures to ensure, on the basis of equality of men and women, universal access to health care, including those related to reproductive health care. Subsequently the National Reproductive Health Strategy for 1997 was developed and it had two principal objectives: to reduce maternal mortality to 170/100,000 live births by the year 2010; and to increase deliveries attended by skilled attendants to 90% by 2010 (13). This is in line with Millennium Development Goals (MDGs) that target reduction of MMR by three quarters by 2015 (14).

At the turn of the century, 189 countries endorsed the Millennium Declaration and signed up to meeting eight goals. The MDGs addressing maternal and child health are:

- 4. Reducing child mortality by two thirds between 1990 and 2015*
- 5. Improving maternal health-by reducing maternal mortality ratio by 75% between 1990 and 2015.*

Millennium Development Goal 5 is one in which the least progress has been made despite the launch over 21 years ago of the safe Motherhood Initiative. Pregnancy, childbirth and their consequences are still the leading causes of death, disease and disability among women in reproductive age in developing countries-more than any other single health problem (27). Progress towards MDGs 4 and 5 vary between countries with some like China and India making steady achievements. Kenya is among the ten countries with least progress in reducing infant mortality and is rated as having a very high maternal mortality(32). Factors such as human resource for health and high HIV burden have prevented the implementation of interventions that could reduce maternal and infant mortality.

It has long been recognized that quality care during labor and delivery is vital for the reduction of MMR. Various studies have demonstrated that antenatal care alone is not sufficient, and that

better results are gained when promoted along with quality intrapartum care (6, 7). In Dominican Republic, a country with nearly universal institutionalized deliveries there was a paradox of a relatively high MMR. Research traced this paradox to overcrowded hospitals, understaffing and inexperienced personnel. The uncomplicated labor and deliveries were "overmedicalized", while complicated ones were not managed appropriately. In those facilities the quality of care was poor and delivery and birthing process was dehumanizing. The conclusion was that institutional delivery alone is not enough to decrease the MMR and that high quality obstetric care helps to save life. (8)

Quality intrapartum care consists of regular monitoring of the women in labor and fetal status. Increasing the quality and regularity of critical observation of the mother and the fetus, and the progress of labor, has been shown to improve the outcome of labor and delivery in several studies (15,16,17). The WHO universal partograph is an ideal tool for the management of labor at all levels of care; at health center level as a criterion for referral, and at hospital level as a criterion for active management of labor or operative intervention(18,19).The partograph is a method of graphically recording the progress of labor as well as maternal and fetal condition. It may be used purely to record observations, but management guidelines to indicate appropriate timing of certain interventions can be incorporated. In the WHO multi-center trial, introduction of the partograph with an agreed labor management protocol reduced both prolonged labor and the proportion of labors requiring augmentation. Emergency caesarian section and intapartum stillbirths fell (15).

In Kenya, as well as other developing countries birth injury fistulae are still common.

The incidence of immediate complications of obstructed labor such as puerperal sepsis, poor Apgar score and infant morbidity and mortality is still high in developing countries (27). Most of these conditions have almost been eradicated in Europe and North America (11). Studies done in Africa have shown that the partograph is necessary, and it is fairly accurate in early detection of abnormal labor, and hence interventions may be undertaken without undue delay (15,20,21,23). Aggrawall (22) observed that obstetric referral from the district and provincial hospitals in Kenyatta National Hospital constitute 3% of the total hospital deliveries, but were responsible for 59% of total maternal deaths. More than a third of the referrals were due to obstructed labor. He recommended that all the outlying hospitals be well equipped to tackle all the obstetric emergencies and the concept of the partograph be introduced in the hospitals. The partograph

was introduced for use in public hospitals in Kenya in 1995. Studies done so far have revealed low utilization of the partograph (9,28) and this has been attributed to inadequate organizational support and training of health care providers. Wanjara (23) and Njoroge (24) found out that only 12% of health care providers in rural Kenya knew how to use a partograph.

Wanjara M.J. in 1991(23) observed that partograph use in management of labor reduced labor complications from 14% to 10%. Perinatal deaths reduced from 102/1000 to 20/1000 and a decrease of the number of the new born with poor Apgar score from 17% to 3.5% (25).The study concluded that knowledge of the use of partograph was poor in Kangundo hospital and probably elsewhere in the small rural hospitals in the country. The 2004 KSPA (26) contradicted this by revealing a significant regional and hospital to hospital variation in utilization of the partograph. Mission hospitals were more likely to use partographs than public hospitals.

In Njoroge's study carried at a rural district in Kenya in 1993, 50% of the health care workers had low knowledge of the partograph (24). The study also showed that the ability to use parameters on the partograph to make decisions was low. Sixty percent of the respondents could not apply the findings on the partograph to make decision on active management of labor. This finding implies that women in labor who are managed by use of the partograph do not necessarily benefit from improved quality of intrapartum care.

Wasike (25) who evaluated the impact of the ministry of health partograph on the active management of labor at Moi Teaching and Referral Hospital Eldoret re-affirmed that use of partograph enables early detection of poor progress of labor and the need for augmentation. Labor complications were lower when partograph was used to monitor the progress of labor. This was a prospective study where outcomes were compared before and after introduction of the partograph. There was a high proportion of use and proper utilization in that delivery unit after the partograph was introduced. Wasike's study was however carried out in a teaching and referral hospital where quality of care is generally high.

Wamwana (9) in 2007 showed that it is possible to dramatically increase the quality of monitoring of labor by training midwives. This study found a significant improvement in recording of diagnoses and plan of management after training. The partograph use before training was only 11% compared to 85% after intervention. The record on fetal condition and progress of labor were significantly improved. Recording of maternal blood pressure, pulse rate,

temperature and respiration showed significant increase from 76% to 90% during intervention.

## **2.0 RATIONALE**

Studies in Kenya have consistently demonstrated low use of the partograph (9,24,26). Even among those women managed by partograph, not all the parameters on fetal condition, maternal condition and progress of labor are documented (9). Furthermore the ability to use the parameters on the partograph to make decisions is low (23,24). The advantage of the use of partograph may be lost because of all these shortcomings. This implies that women in labor managed by use of partograph in rural Kenya do not necessarily benefit from improved quality of intrapartum care or better obstetric outcomes. Partograph is only useful in raising the quality of care if well documented and appropriate action taken (15). This study is designed to compare intrapartum care and obstetric outcomes between women managed by use of the partograph and those who are not in a district hospital.

## **2.1 OBJECTIVES**

### ***BROAD***

The main objective of this study was to compare the quality of intrapartum care and obstetric outcomes in women managed by use of the partograph and those who were managed without partograph in Kajiado district hospital.

### ***Specific***

1. To determine the proportion of women who are managed by use of partograph.
2. To compare the frequency of monitoring of fetal condition, maternal condition and progress of labor in women managed by partograph and those who were not.
3. To compare the proportion of women who are actively managed during third stage of labor by use of oxytocics in the exposed and unexposed groups.
4. To compare maternal and perinatal outcomes.

## **2.2 HYPOTHESIS**

Non use of the partograph is associated with poor quality of management of labor and adverse maternal and perinatal outcomes.

### **2.3 Main outcome measures**

The main outcome measures were::

- 1 Use of the partograph



- 2 Duration of active phase of labor in the health facility
- 3 Quality of monitoring fetal condition, maternal condition and progress of labor.
- 4 Proportion of women who are actively managed during third stage of labor
- 5 Record of events
- 6 Maternal and perinatal outcomes.

## **3.0 METHODS**

### **3.1 STUDY AREA**

This study was carried out in Kajiado district hospital in south Rift Valley.

Kajiado district hospital is situated about 80 km from Nairobi along Nairobi-Arusha road. The hospital serves as a district referral center for a population of 410,000 people (28). Fertility rate which is closely associated with knowledge and use of family planning methods, level of education and status of women in the society stood at 6.1 in 1999, a rate that is higher than national average of 4.9(4).Kajiado district hospital has one maternity ward, male medical/surgical ward, female medical/surgical ward and a pediatric ward. Maternity ward has twenty four beds where women in stage one of labor and postnatal mothers stay, with a delivery room adjacent. The duties in labor ward are arranged such that there are two midwives, one obstetrician/gynecologist, a medical officer, a ward in-charge and a support staff working per shift. The Obstetrician/gynecologist is also the medical superintendent and is obliged devote time to carry out managerial activities. There are an average of five patients in the unit making the midwife patient ratio of 1to 3. The hospital conducted about 1400 deliveries in the year 2006 (28). It is served by one obstetrician, four medical officers, nurses and clinical officers. The district also has 8 health centers which refer patients to the main hospital.

### **3.2 Design**

This was a retrospective cohort study comparing the quality of intrapartum care and obstetric outcomes in women who were managed by use of partograph (exposed) and those who were not managed by use of the partograph (unexposed).

### **3.3 Exposure of Interest**

In this retrospective cohort study the exposure of interest was the partograph. Quality of intrapartum care was compared between women managed by use of partograph (exposed) and those who are not (unexposed).

**Exposed:** Records of women admitted to delivery unit and who were expected to have a normal vaginal delivery were reviewed. A woman in labor had to meet the following criteria to be considered exposed:

- patient observed in the hospital for one hour or more.
- Cervical dilatation indicated on the partograph at least once with or without descent of the presenting part.
- Measurements of FHR and uterine contraction charted till delivery.
- Maternal B/P or pulse recorded once or more.

For those who met the criteria their partographs were reviewed looking at the fetal conditions (FHR, liquor, molding), Maternal condition (pulse/P/urine) and progress of labor (contraction, dilatation, descent).

**Unexposed:** Those who did not meet the above criteria were considered unexposed.

Observations were found in patient notes, nursing cardex, discharge summaries and on under filled partographs. A thorough search was done looking in to intrapartum evidence of maternal and fetal conditions, progress of labor and maternal and perinatal outcomes.

### **3.4 SAMPLE SIZE**

The determination of sample size was based on the proportion of partograph use, and critical practices for monitoring normal deliveries (Maternal blood pressure, pulse and contractions; and fetal heart rate) as found in the previous studies.

Percent use of partograph in management of labor is 11%, non use at 89%(16)

- 3 Proportion of women with all the critical practices for monitoring of normal labor recorded is 5% (26)
- 4 Proportion of women with one of the critical practices for monitoring of normal labor recorded is 22% (26).

Using Epi-info the sample size was calculated as shown below.

Sample size (comparing unequal proportions)

Formula

For unequal groups of size  $n_1$  and  $n_2$ , where  $r = n_2/n_1$ , is

$$n_1 = \frac{\left[ \frac{1}{1-r} \sqrt{(1-r)\bar{p}q} + \sqrt{r} \sqrt{rp_1q_1 + p_2q_2} \right]^2}{rd^2}$$

where  $\bar{p} = \frac{n_1 p_1 + n_2 p_2}{n_1 + n_2}$  and  $n_2 = rn_1$ .

For small samples, employ a "continuity correction"

$$n_1 = \frac{n_1^*}{4} \left( 1 + \sqrt{1 - \frac{2(r-1)}{n_1^* r |d|}} \right)^2$$

Reference

Levinson, J.L. Statistical Methods for Rates and Proportions (2nd edition). Wiley:New York, 1981.

Factor under consideration

"Critical practices for monitoring normal deliveries"

1<sup>ST</sup> GROUP

"Used Partograph"

2<sup>ND</sup> GROUP

"Did not use Partograph"

Parameter

Symbol

Value

Proportion of "Critical practices for monitoring normal deliveries" in "Used Partograph" group

$p_1$

22.0%

Proportion of "Critical practices for monitoring normal deliveries" in "Did not use Partograph" group

$p_2$

5.0%

OR

D

0.17

OR Ratio

OR

5.36

Proportion of participants expected in "Used Partograph" group

$m_1$

50.0%

Proportion of participants expected in "Did not use Partograph" group

$m_2$

50.0%

Ratio of ("Used Partograph": "Did not use Partograph") sizes

R

1.00

Continuity corrected

p-bar

0.135

$1-\beta$

80%

z- $\beta$

0.84

Confidence level

$1-\alpha$

95%

Number of subjects required for "Used Partograph" group

$n_1^*$

62

Number of subjects required for "Did not use Partograph" group

$n_2^*$

62

number of subjects required for "Used Partograph" group	n <sub>1</sub>	74
number of subjects required for "Did not use Partograph" group	n <sub>2</sub>	74
		148

### 3.5 Exclusion Criteria

To reduce bias this study focused on women who had normal labor at the time of admission and were expected to have vaginal delivery. The following were therefore excluded: gestation less than 34 weeks, patients delivered by caesarean section on elective basis, patients admitted in second stage of labor and all cases that required emergency caesarean section on admission. Also excluded were patients with APH and eclampsia at admission.

### 3.6 Data Collection/ Study procedure

Data was collected by the principal investigator and three assistants. A pre-tested structured questionnaire was used to collect data. Two midwives and a medical records officer were recruited and trained for the study. The in-patient numbers were obtained from the admission and discharge registers in labor ward and maternity. Case files and nursing cardex were examined in search for information. The files were retrieved from the records department beginning with patients who were admitted on 1<sup>st</sup> July 2007 serially until the sample size was met for patients admitted on 20<sup>th</sup> October 2007. At this point a total of 207 had been admitted in labor ward.

### 3.7 DATA ANALYSIS

Data was analyzed using Statistical computer programs-Excel and SPSS and results presented in prose, graphs, tables and charts. Descriptive data including the means, range and standard deviation were calculated as well as relative risk, chi square and p values.

### 3.8 Ethical Consideration

The proposal was submitted to the Ethical and Research Committee of Kenyatta National Hospital and approval was obtained in March 2009. Approval by Kajiado district health management team was obtained in April 2009.

To maintain confidentiality patient records were coded and patients' names were not used. Patient care was not compromised since data was collected from patient's files long after the patient had been discharged.

Data collected was used for the purpose of this study only.

### **3.9 Study Limitation**

This was a retrospective study in which patient delivery records were used to assess the quality of care. As such the quality of record keeping had an impact on the outcomes of this study. These included incomplete retrieval of patients' records and misplacement of patient records- in part or whole as well as missing data.

## 4.0 RESULTS

Table 1 summarizes baseline patient characteristics at cohort entry. A total of 74 patients were managed with partograph and 79 were managed without partograph in labor. Mean patient age was 24.6 among exposed and 26.3 among unexposed. Mean parity was 1.6 among exposed and 1.8 in unexposed. Socio-demographic characteristics and maternal variables of the women managed by partograph (exposed) and those managed without partograph (unexposed) were similar.

**Table 1: Descriptive data for socio-demographic characteristics**

	<u>Exposed n=74</u>	<u>Unexposed n=79</u>
Age in years, n (%)		
Below 19 yrs	21(28.3)	22(28)
19-24	20(27)	15(19)
25-34	28(37.8)	30(37.9)
35-44	5(6.7)	12(15.1)
Mean age, (SD)	24.6(6.2)	26.3(6.2)
Marital status, n (%)		
Single	16(21.6)	7(8.5)
Married	52(70.2)	49(62)
Missing data	6(8.1)	23(29.1)
Level of education		
Primary	31(41.8)	31(39.2)
Secondary	9(12.1)	11(13.9)
Tertiary	3(4.0)	2(2.5)
No formal Education	2(2.7)	1(1.3)
Data missing	29(39.1)	34(43)
Occupation		
Salaried	6(8.1)	5(6.3)
Self employed	16(21.6)	23(29.1)
H/wage	25(33.7)	26(32.9)
Missing data	27(36.4)	25(31.6)

Table 1 show that 28% of women who delivered at the hospital were teenagers (below 19yrs). This rate of teenage pregnancies was higher than the national average which stood at 23% in 2003 (4). Majority i.e. 62 (40.5%) had primary level of education and most of them were housewives. The mean age was 24.6 years among the exposed and 26.3 among the unexposed with standard deviation of 6.2 years. Both groups had similar age range of 14-41 and 14-44 for those exposed and unexposed respectively.

**Table2: maternal variables and birth weights**

	<u>Exposed, n=74</u>	<u>Unexposed, n=79</u>
Parity, n (%)		
primigravidae	32(43.2)	30(37.9)
1-2	20(27)	21(26.5)
3-4	19(25.6)	20(25.3)
>4	3 (4.1)	8 (10.1)
<i>Mean parity. (SD)</i>	<i>1.6(1.2)</i>	<i>1.8(1.2)</i>
Gestation age (wks)		
37-42	65(87.8)	72(91.1)
<37	3(4.1)	4(5.1)
>42	6 (8.1)	3 (3.7)
<i>Mean,(range)</i>	<i>38 6/7(34-42)</i>	<i>38 4/7(34-43)</i>
ANC Attendance		
Yes	13(17.5)	12(15.1)
No	61(82.4)	67(84.8)
Cervical dilatation at admission, n (%)		
≤ 3cm	15(20)	16(20.2)
≥ 3cm	59(80)	63(79.7)
<i>Mean dilatation</i>	<i>5.3cm</i>	<i>4.9cm</i>
Birth weight in (g), n (%)		
2500-4000	65(87.8)	66(83.5)
Below 2500	5(6.7)	9(11.3)
Above 4000	4(5.4)	4(5.0)
<i>Mean birth weight (SD)</i>	<i>3211gms (537)</i>	<i>3253gms (537g)</i>

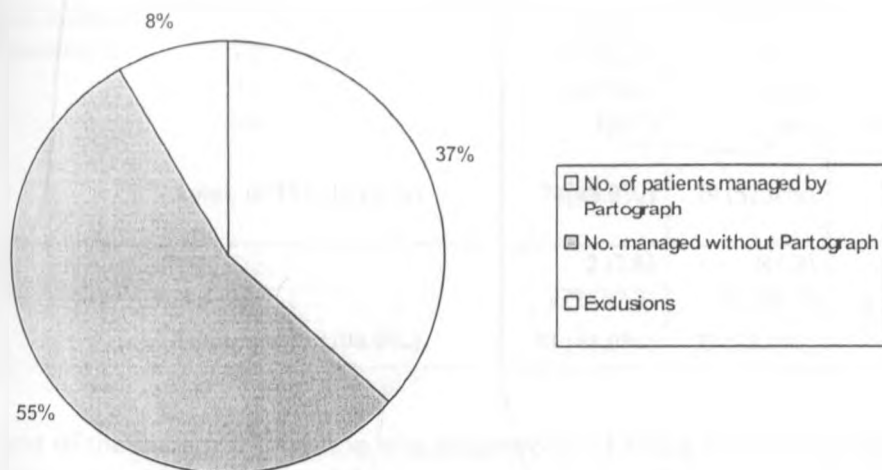
Table 2 shows that the Obstetric characteristics of women in this cohort were comparable. Those who were admitted with cervical dilatation above three were 80% and 79.7% respectively. Primigravidae constituted 43.2% among the exposed and 37.9% in the unexposed group. The mean cervical dilatation at admission was 5.3 and 4.9 for the exposed and unexposed respectively. Hospital ANC attendance was generally low with the results showing that 17.5% and 15.1% of the exposed and unexposed respectively had their antenatal care at the institution. ANC attendance in Kenya stood at 88% in 2004(4). Majority of the women who came to deliver in Kajiado district hospital are thought to have attended ANC in other institutions including public health centers, dispensaries and NGO based care givers.

Gestations at delivery were similar with 87.8% (exposed) and 91.1% (unexposed) of the women admitted for delivery between 37 and 42 weeks, and with mean gestation of 38 weeks 6 days and 38 weeks 4 days respectively. Birth weights were also comparable at 3211g and 3253g with standard deviation of 537g. Tables 1a and 1b reveals that the participants were well matched.

### Partograph use

Figure 1 summarizes the use of the partograph in management of labor at Kajiado district hospital from 1<sup>st</sup> July to 20<sup>th</sup> October, 2007.

Figure 1. Partograph use among women in labor, n=207



There were 207 admissions to labor ward in the period under review (1<sup>st</sup> July-20<sup>th</sup> October 2007). Thirty seven per cent were managed by partograph and 55% were not. Eight per cent of the files were excluded due to so much information missing that they could not be useful.



**Table 3: Frequency of monitoring of maternal condition**

		Exposure to partograph		p-value	Relative risk	95% Confidence Interval
		Yes n=74	No n=79			
BP recording, n (%)	1-2,	56 (75.6)	45 (57)	0.005	-	-
	>2, 6 (3.9)	5 (6.7)	1 (1.2)			
	Not recorded 46(31)	13 (17.5)	33 (41.7)			
	<b>Total, n=153 (100.0%)</b>	<b>74 (48.0%)</b>	<b>79 (52.0%)</b>			
No. of times mothers pulse is measured, n (%)	0	8(10.8)	70 (88.6)	0.005	-	-
	1-2	49 (66.1)	9 (11.3)			
	3-4	12 (16.2)	0 (0)			
	>4	5(6.7)	0(0)			
	<b>Total, n=153 (100.0%)</b>	<b>74(48.0%)</b>	<b>79 (52.0%)</b>			
Urinalysis Done at least once, n (%)	Yes	2 (2.6)	1(1.3)	0.583	0.7	0.1-3.4
	No	72 (97.2)	78 (98.7)			
	<b>Total, n=153 (100.0%)</b>	<b>74 (48.0%)</b>	<b>79 (52.0%)</b>			

Assessment of the maternal condition was achieved by charting maternal pulse, blood pressure and urinalysis. In table 3, 82.4% of the exposed women had B/P measured at least once during labor as compared with 58.2% among the unexposed. Thirty one per cent of women in labor had no B/P record at all and the bulk of these were in the unexposed group i.e. 33 (41.7%) as compared to 13 (17.5%) among the exposed. These differences were significant with the exposed women more likely to have their B/P measured during labor (P=0.005). Major differences were noted in the measurements of maternal pulse with 88.6% of the unexposed going through labor without evidence of pulse measurements compared to 10% among the exposed group (P=0.005). Urinalysis was the least reported component of maternal condition with 98.1% of mothers going through labor without urinalysis being done. This was a common occurrence in both groups and there were no statistical differences between women managed by use of the partograph (exposed) and those managed without its use (unexposed) (RR 0.7, 95%CI 0.1-3.4, P=0.583).

**Table4. Association between partograph use and frequency of monitoring of fetal conditions**

	Exposed n=74	Unexposed n=79	P value	Relative risk	95% Confidence interval
Mean no. of times FHR is recorded	6.8	2.8	-	-	-
FHR take ½ hourly	17 (22.9%)	1 (1.26%)	0.005	3.1	2.2-4.2
Documentation status of membranes/ liquor	39 (52%)	17 (21.5%)	0.005	2.3	1.5-3.5
Moulding:					
Present	8 (10.9%)	2 (2.6%)	0.859	-	-
Absent	0 (0%)	0 (0%)			
Not reported	66 (89%)	79(97.4%)			

In table4, the mean number of times the fetal heart rate was recorded was 6.8 times per woman in labor in the exposed group, and 2.8 times per woman in labor in the unexposed group. This marked difference is strengthened by comparable duration of labor at the hospital i.e. 6.1 hours minutes and 6.8 hours for exposed and unexposed respectively (table 6). Thus the mean time between two FHR records was 53 and 135 minutes for the exposed and unexposed respectively. Among the exposed, 22.9% had FHR charted half hourly as expected which compares poorly with 1.5% among women managed without use of the partograph. These differences were significant (RR 3.1, 95% C.I.2.2-4.2, P=0.005). Documentation of the status of membranes/liquor was done in 52% of the partograph group compared to 21.5 % of the unexposed RR2.3, 95%C.I.1.5-3.5, P=0.005). Data in molding was largely missing with 89% of the partograph group going unreported and 97% of the unexposed group missing data on this important parameter.

**Table5: Frequency of monitoring of progress of labor**

Labor progress indicator	Exposure to partograph		p-value	Relative risk	95% Confidence Interval	
	Yes n=74	No n=79				
Cervical dilatation recorded	Yes	71(96%)	66 (83.5%)	0.034	2.4	0.9-6.6
	No	3 (4%)	13 (16.4%)			
Descent in fifths recorded	Yes	57 (77.0%)	34 (43%)	0.005	2.2	1.4-3.4
	No	17 (22.9%)	45 (57%)			
No. and strength of contraction documented		70(94.5%)	0 (0.00%)			

In table 5,cervical dilatation was clearly indicated in 96% of the women managed by the use of the partograph as compared to 83.5% of the unexposed group (RR 2.4,95%C.I.0.9-6.6,P=0.034).

Descend was recorded in 76% among the exposed compare to 45% of the unexposed and this was statistically significant (RR 2.2, 95%CI.1.4-3.4, P=0.000). The strength and number of uterine contraction were charted as in 94.5% among the exposed, and none among unexposed (p=0.005).

**Table6: Duration of labor**

		Exposure to partograph		Chi-square	P value
		Yes n=74	No n=79		
Duration of labor (hrs)	<6 , n=68 (44%)	37 (50%)	34 (43%)	0.339	0.952
	6-12	28 (37.8%)	23 (29%)		
	13-18	7 (9.4%)	7 (8.8%)		
	Above 18 hours	2 (2.7%)	4 (5%)		
	Missing data	0 (0)	11 (14%)		
	Mean length of labor in hours	6.1	6.8		

In table6, 44% of women delivered within six hours of admission. Of these 37(50%) were managed by use of the partograph (exposed) as compared to 43% who were unexposed. The mean length of time women spend in labor was 6.1 and 6.8 hours among the exposed and unexposed respectively. Prolonged labor (>18hrs) was twice more likely to occur in the group of women managed without using the partograph. These differences however, were not significant (chi-sq 0.339, P=0.952). It was not possible to establish the length of labor in 11 (14%) among the unexposed group.

**Table7. Partograph and Mode of delivery**

		Exposed n=74	Unexposed n=79	Chi - square	P value
Mode of delivery	Normal	63 (85.5%)	68 (86%)	1.07	0.591
	Caesarian	11 (14.4%)	9 (11.4%)		
	Breech	0 (.0%)	2 (2.5%)		
	Total	74 (48%)	79 (52%)		

In table 7, the exposed group 85.5% had spontaneous vertex delivery and a caesarean section rate of 14.4%, which compares favorably with 86% of spontaneous vertex deliveries and caesarean section rate of 11.4% among unexposed(Chi-sq 1.07, P= 0.591).

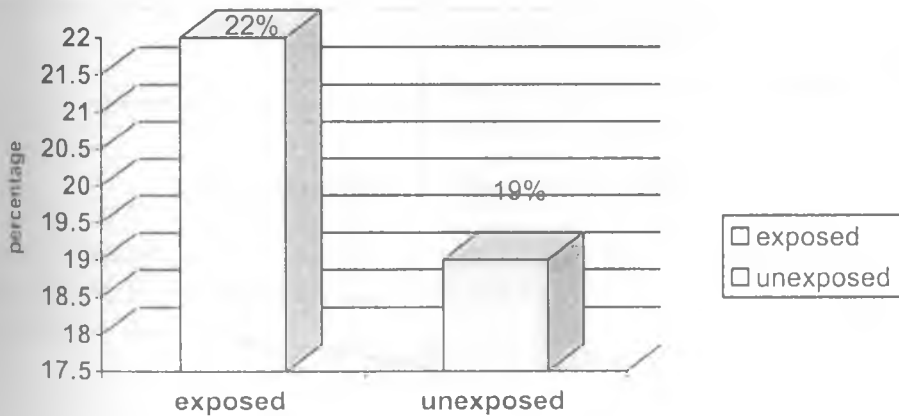
**Table 8. Mode of delivery among labors not reaching / crossing action on partograph, n=74**

Mode of delivery	Action line not reached n=49(67%)		Action line reached or crossed n=24 (32%)		p. value	Relative risk	95% confidence interval
SVD normal	46	91.8%	18	75%	0.049	2.8	1-4
Caesarean	4	8.1%	6	(25%)			

In table 8, caesarean section rate among women managed by partograph and whose tracing did not reach the action line was 8.1%. However this rate more than tripled (25%) when action line was reached or crossed and this was significant (RR 2.8, 95% C.I. 1-4, P=0.049). This reveals that decisions in favor of caesarean section were influenced by the partograph. The downside of it is that decisions to augment labor was low leading to prolonged labors and increased rate of caesarian section, a view supported by figure 2.

**Figure 2: Bar graph showing rate of augmentation of labor**

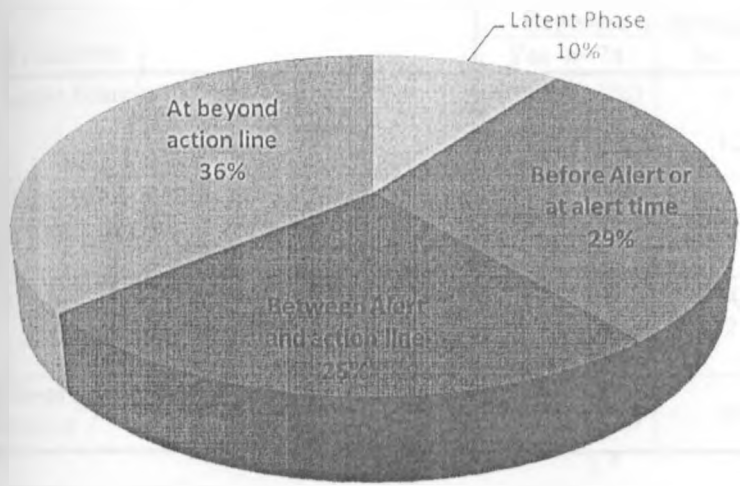
Figure 2 summarizes the rate of augmentation of labor among the exposed and the unexposed groups.



In figure 2, it is clear that the rate of augmentation of labor was essentially similar

**Figure 3: Position of the last partograph entry**

The following chart shows the position of the cervical dilatation on the partograph at delivery (n=74).



In figure 3, 36% of labors reached or crossed the action line and 10% had the last partograph in latent phase.

**Table 9: Oxytocic use in 3<sup>rd</sup> stage of labor**

		Exposure to partograph		p- Value	Relative risk	95% Confidence interval
		Yes, n=74	No, n=79			
Oxytocics given immediately after delivery	Yes	47 (63.5%)	36 (45.5%)	0.026	1.9	1.0-3.4
	No	27 (36.4%)	43 (54.4%)			
	<b>Total, n=153 (100%)</b>	<b>74(48.0%)</b>	<b>79 (52%)</b>			

As shown in table9, the use of oxytocics immediately after delivery stood at 63.5% among the exposed and 45.5% among the unexposed, and this was statistically significant(RR1.9,95%C.I.1-3.4,P=0.026).

**Table 10: Perinatal outcomes**

Perinatal outcome	Exposure to partograph		P value	Relative risk	95% confidence interval
	Yes n=74	No n=79			
Infants Apgar score at 5 minutes	8-10 7 or below	66 (89.1%) 8 (11%)	67 (85%) 12 (15%)	0.559	1.3 0.8-2.1
No. of infants resuscitated e.g. ambu bag, oxygen, drugs etc	N=18	8 (10.6%)	10(12.3%)	0.913	1.0 0.6-1.7
Newborn status	Live birth FSB	74(100%) 0 (.0%)	77 (97.5%) 2 (2.5%)	0.047	2.0 1.7-2.4
No. of infants admitted to NBU/Referred	N=16	7 (9.2%)	9(11.1%)	0.337	0.8 0.4-1.4

Apgar score at five minutes as well as rate of infant resuscitation and admission to new born unit were comparable in both groups without any statistical differences.

There were two fresh still births among those managed without the use of partograph and none of those who were exposed. The difference was statistically significant (RR2, 95%C.I.1.7-2.4, P=0.047)).

**Table 11: Maternal outcomes**

Maternal outcomes	Exposure to partograph		P value	Relative risk	95% confidence interval
	Yes n=74	No n=79			
No. of women who had PPH	N=7	3 (4%)	4(5.1%)	0.484	0.7 0.2-2.2
Maternal trauma (perineal, vaginal, cervical ) excluding episiotomy	N=13	3 (4.5%)	2 (2.6%)	0.596	1.2 0.2-2.4
Incidence of genital infection requiring antibiotics within seven days of delivery	N=7	3 (4.1%)	4 (5%)	0.426	0.8 0.4-1.6

As shown in table 11, maternal outcomes were comparable in as far as postpartum hemorrhage, genital infection and perineal trauma is concern, without any significant statistical differences. Incidences of genital infections that require treatment with antibiotics was comparable at 4.1% and 5% respectively. This apparent lack of significant differences is attributed to the small sample size in this study.

**Table 12: Length of hospital stay**

Days spent in hospital	Exposed n=74	Unexposed n=79	Chi-square	P value
Normal, 1-3	64 (86.4%)	63 (79.7%)	3.65	0.161
Prolonged: 4-6	9 (12.1%)	13 (16.4%)		
>7	1 (1.3%)	3 (3.7%)		
Mean length of stay in days	2.69	3.04	-	-

Table 12 shows normal hospital stay (1-3 days for the purpose of the study) was 86.4% for those managed by use of the partograph and 81% among those not exposed to partograph as shown in table 10. Prolonged hospital stay (>7 days) was higher among unexposed at 3.7% compared to 1.3% of the exposed. These differences were however not statistically significant (Chi-sq 3.65, P=0.161). The mean length of admission was 2.7 and 3.0 days among the exposed and unexposed respectively.

## Discussion

This was a retrospective cohort study comparing women exposed to partograph during labor and those who were not at Kajiado district hospital. A total of 207 files were reviewed beginning 1<sup>st</sup> July, 07 to 20 October 2007. Out of this 74 (37%) of the women were managed by partograph and 116 (55%) were managed without. Another 17 (8.2%) of the files were excluded.

The study groups had comparable socio-demographic characteristics. However teenagers constituted 29% of the women who delivered at the hospital, a figure that is higher than national teenage pregnancy rate which stands at 23% (4,5). Early marriages coupled with high school drop out and generally low literacy rate could explain this phenomenon at Kajiado (29). It also has a direct bearing in the socio-economic position of women in the society. Maternal variables such as parity, gestational age, ANC attendance, cervical dilatation at admission and birth weights of infants were also comparable. The mean gestational age at delivery was 38week six days for the exposed and 38 weeks four days for unexposed. This finding is comparable with the WHO trial study (30) where the mean gestation age at onset of labor was 39 weeks.

The use of a partograph in Kajiado district hospital during the period under review stood at 37%.

This level of utilization of partograph is quite low compared to what was reported at Moi teaching and referral hospital in 1999 by Wasike (25). In his series he found out that 91% of women were exposed to partograph and only 9% were managed without the use of partograph. Nationally, 40% of eligible public health facilities were found to have partographs ready for use in the Kenya service provision assessment survey (KSPA) of 2004. This low utilization of the partograph in Kajiado (and probably most district hospitals) means that women delivering in that hospital do not receive optimum quality intrapartum care and therefore complication may not be dealt with in a timely manner. This has a direct impact on the rate of maternal morbidity and mortality at national level. Wamwana E, Ndavi P.M. et al (9) showed that the quality of record keeping in the intrapartum period can be markedly improved within months by training midwives through on-job training.

Assessment of maternal condition during labor was achieved by measuring maternal pulse, blood pressure and urinalysis. Blood pressure measurements were significantly higher in the exposed group with 82.4% having their blood pressure measured at least once compared with 58.2% among the unexposed. Among the exposed, 17.5% had blood pressure not measured compared with 41% in the unexposed group ( $P=0.005$ ). Blood pressure measurements is ideally done four hourly, and together with urinalysis is used to identify women who may develop pre-eclampsia during labor so that appropriate and timely interventions is executed to prevent eclampsia. Monitoring of the woman's pulse during labor was significantly lower for the unexposed ( $P= 0.005$ ). Among the unexposed, pulse was not measured in 88.6% compared to 10.8% in the exposed group. Ideally pulse rate should be monitored on half hourly basis. The KSPA 2004(26) found similar low records on parameters for monitoring maternal condition and the lowest was measurements of maternal pulse, which stood at 8% nationally. In this cohort, exposure to the partograph was associated with a significant improvement in measurement of the pulse, which rose from 11.3 % ( among unexposed) to 89% among the exposed ( $P= 0.005$ ). Urinalysis was the least recorded parameter with only 2.6% and 1.2% among the exposed and unexposed respectively having at least one urine test in the course of labor (RR 0.7, 95% CI 0.1-3.4,  $P=0.583$ ). This low rate of urinalysis makes it difficult to identify women with pre-eclampsia, particularly in this hospital where a vast majority of women in labor had not attended ANC in the same institution. Qureshi et al (30), in a rapid assessment of the utilization of the partograph in selected maternity units found out that only 1% of women had urinalysis



while in labor, a finding that is in tandem with the results of this study.

Cervical dilatation was clearly indicated in 96% of women who were exposed to partograph compared to 83.5% of the unexposed. This difference was significant (RR2.4, 95%CI.0.9-6.6, P=0.034). Monitoring of descent of the presenting part was lower among unexposed (43%) compared to 77% in the exposed group. Again this was statistically significant (RR2.2, 95%CI.1.1.4-3.4, P=0.005). Monitoring of the number and strength of uterine contractions were charted in 94.5% among the exposed, as compared to none among the unexposed. The KSPA 2004 (26) reported that only 19% of women in labor had assessment of contractions charted as required. Generally monitoring of the progress of labor in Kajiado district hospital was low even among those exposed to the partograph. It is particularly important to note that the rate of augmentation of labor was comparable between the two cohorts, a finding that is at odds with the WHO (16) study that showed decreased rate of augmentation (from 20% to 9%), when partograph was used. This could be due to decisions made without reference to the partograph in Kajiado district hospital. In the contrary, Wasike (25) reported 16% rate of augmentation among women exposed to the partograph, and a lower rate of 1.3% in women managed without use of the partograph. All these divergent findings from various studies, including this study, could be attributed to variation in intrapartum decision making and interventions and changes in practices over time.

In figure 3, it is noticeable that 36% of labors among the exposed group crossed the action line and this was associated with threefold rise in caesarean section rate (table 6b). All these could have been prevented or reduced by timely interventions, including augmentation of labor. The mean length of labor was 6 hours 6 minutes among the exposed and 6 hours 48 minutes among the unexposed. Fifty per cent of the women managed by use of the partograph delivered within six hours of admission, as to 43% among unexposed. Prolonged labor (>12hours), occurred in 12.1% and 13.5% among the exposed and unexposed respectively. There were no statistically significant differences between the exposed and unexposed regarding the length of labor (Chi-sq 0.339, P=0.952). A study carried out in Malawi, WHO (17) reported decreased rate of prolonged labor (i.e. from 14% to 4%) when partograph was used appropriately. In Kajiado district hospital, the advantage of shorter duration of labor could have been lost due to low utilization of the partograph in decision making, and timely interventions. Wasike (25) observed that 57% women exposed to partograph delivered within 8 hours of admission compared to 34%

among the unexposed. Wanjara (23) reported 86.4% deliveries within 8 hours of admission for women managed by partograph, and 44% among those who were managed without use of partograph.

Studd (31) showed that the use of partograph significantly reduce labor lasting more than 18 hrs from 14% to 3%. A similar trend was observed in this study though marginally, with labors lasting 18 hours reduced from 3.7% in the unexposed group, to 1.3% among the exposed (Chi-sq 0.339, P= 0.952). The partograph only reduces the length of labor when appropriate decisions are made and appropriate and timely interventions are carried out. Njoroge (24), in a study done in rural Kenya, reported that 50% of the health workers had low knowledge of the partograph and its utilization, a factor that hampers appropriate interventions and delays timely decisions.

Normal deliveries (SVD) accounted for 85.5% among the exposed compared to 86% in the unexposed. Caesarean section rate stood at 14.4% and 11.4% for the exposed and unexposed respectively. There were no statistically significant differences in the mode of delivery (Chi-sq 1.07, P= 0.591). These findings compares with Wasike's (25) who reported a caesarean section rate 8% and 12% for women managed by use of partograph and those managed without use of partograph respectively. Wanjara (23) had a lower caesarean section rate of 3.5% (exposed) and 4.1% (unexposed) in a study done in 1991, a reflection of temporal changes in rate of caesarean section.

Use of oxytocics immediately after delivery as part of active 3<sup>rd</sup> stage management of labor was more likely to be done among the exposed group (63.5%) than unexposed (45.5%) and this was statistically significant (RR 1.9, 95% C.I. 1.1-3.4, P=0.026).

Perinatal outcomes were assessed through Apgar score, birth weights, admission to newborn unit, infant resuscitation and infant status at birth. Birth weights were comparable (table 1). The rate of infant resuscitation and admission to NBU were also comparable. Majority of the infants had good Apgar score at five minutes. However perinatal deaths occurred in 2.5% among unexposed and none among exposed and this was statistically significant (RR 2.0, 95% C.I. 1.1-2.4, P=0.047). The WHO (17) reported perinatal mortality rate of 0.3% (exposed) and 0.5% (unexposed). Wanjara (23) in 1991 found that perinatal deaths decreased from 102/1000 to 20/1000 and poor Apgar decreased from 17% to 3.5% with use of the partograph.

The maternal outcome variables were not significantly different between the exposed and

unexposed as well as length of hospital stay and this due to the relatively small sample size in this study.(Chi-sq 3.65, P=0.161)

## **CONCLUSION**

There is low utilization of partograph at Kajiado district hospital with only 37% of women in labor having partograph charted. There was no shortage of partographs in the hospital as revealed by its presence in all files. Accurate recording of the parameters to monitor the mother, the fetus and progress of labor as recommended were mostly not done. Whenever it was used the partograph significantly influenced the frequency of monitoring of maternal and fetal condition as well as progress of labor. There was no evidence of oxytocic use in 3<sup>rd</sup> stage among majority of women. The absence of significant differences between exposed and unexposed in maternal and perinatal outcomes is attributed to the small sample size.

## **RECOMMENDATION**

1. There is need for continuous medical education and on job training of all those involved in management of labor with a view to ensuring universal use of partograph.
2. Midwives and doctors should be impressed upon the need chart partograph appropriately.
3. Health workers should be impressed upon the need to make timely decisions based on the partograph.
4. A study looking in to the use of the partograph and decision making at district hospitals will help to shed more light on the utilization of the partograph at this level.

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## Appendix I: Questionnaire

### USE OF THE PARTOGRAPH AND OBSTETRIC OUTCOMES IN KAJIADO DISTRICT HOSPITAL

SERIAL NO..... EXPOSED..... NOT EXPOSED.....

HOSPITAL NO.....

#### PERSONAL DATA OF THE WOMAN

1. Mother's age at the time of delivery

\_\_\_\_\_ Yrs (9) Not documented

2. Occupation

(i) Salaried (ii) Self employed (iii) House wife (iv) Others specify.....

9. Not documented

3. Marital status

(i) Single (ii) Married (iii) Widower (iv) Divorced (9). Not documented

4. Woman's level of education

(i) Primary (ii) Secondary (iii) Tertiary (iv) No formal education

9. Not documented

#### OBSTETRICS

1. Number of pregnancies including the last pregnancy

99 - Not documented.

2. Number of previous births excluding the last deliver

3. ANC attendace in the hospital.....

1. yes      2. no

4. Parity \_\_\_\_\_ + \_\_\_\_\_

5. When was the last monthly period (LMP)

i. \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_      2. Not known (9) Not Documented.

6. What was the expected date of delivery (EDD)

i. \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_      2. Not known (9) Not documented

7. Gestation delive  ..... Wks

99 – Not documented

8. Mode of delivery

i. Normal delivery (ii) Caesarian delivery (iii) Breech

(iv) Assisted vaginal delivery (9) – Not documented

8. If C/S state the indication.....

9. If SVD state the duration of labor in hours

while at hospital

99 Not documented

**MONITORING OF LABOUR**

1. Initial Examination

(a) Fundal height  wks

(i) Yes      (ii) No      (iii) 9 – Not documented

(c) Presentation

1 –cephalic      2. not cephalic 3. not sure      9 – Not documented

2. Diagnosis is clearly stated

1 yes      2- No      9 – Not documented

3. Was the partograph used?

1 – Yes      2 – No    3. Not recorded

4. If yes how complete is it.....

1. Fully completed    2. partially completed

**5. Fetal well being parameters**

5 (a) – Number of times fetal heart rate is taken \_\_\_\_\_

99 – Not documented

5 (b) – Is fetal heart rate (FHR) taken every ½ ho

1 – Yes      2 – No

5 (c) – Status of membranes and liquor documented

1- yes      2- No      9 – Not documented

5 (d) – If yes at what intervals

1 - Taken once only

2 - Taken every 4 hours

**6. Maternal well being**

(a) Pulse rate recorded

1- Yes      9 – Not documented

(b) If yes at what intervals in minutes

99 – not documented

(c) How many times is blood pressure recorded?

99 – Not documented

(d) Was the B/P recorded

1. Yes      2. No



(g) Was the B/P normal.....

1. Yes                      2. No

(e) Urinalysis

(i) Done at least once (ii) Not done (9) Not documented

**7. Progress of labor**

(a) Number of vaginal examination in labor

(b) Cervical dilatation at admission.....

(b) Descent in fifths recorded

1. Yes                      2. No                      99-Not documented

(c) Molding reported

1. Yes                      2. No                      99- Not documented

(d) Was there caput

1. Yes                      2. No                      99. Not documented

(e) Augmentation of labor with oxytocin.....      1. yes      2. no

(f) Duration of 1<sup>st</sup> stage in hours.....

(g) Uterine contraction charted.....      1. yes      2.no

**g—k for those exposed to the partograph only**

(g) Whether moved to the right of alert line.....      1. yes      2. no

(h) Whether reached\ crossed action line .....1. yes      2. no

(i) Dilatation when reached\crossed action line.....cm

(J) Descend of head in fifths when reached\crossed action line.....

(k) Action taken (if any) when reached\crossed action line.....



**11. Infant well being**

- (a) Newborn status   
1. Live birth    2. FSB    3. MSB                      99- Not documented
- (b) Infants Apgar score at 5 minutes   
1. 8-10                      2. 5-7                      3. Below 5    99- Not documented
- (c) Was the infant resuscitated e.g ambu bag, oxygen, drugs etc  
1 yes            2. no            99- not documented
- (d) Sex of the infant   
i. Male            ii. Female            99- Not documented
- (e) Birth weight in grams   
i. 2500 to 4000 gms ii. Below 2500gms iii Above 4000gms( 99)- Not documented
- (f) Was the infant admitted to NBU/Referred   
1. Yes                      2. No                      99- Not documented
- (g) If yes state the reason for admission\ referral.....

12. Length of Hospital stay, from the day the mother was admitted for delivery to the day she was discharged.                      Days                        
99- Not documented

13. Incidence of genital infections requiring antibiotics within seven days of delivery.....  
1. yes                      2. no



KENYATTA NATIONAL HOSPITAL  
PARTOGRAPH

KNH 329



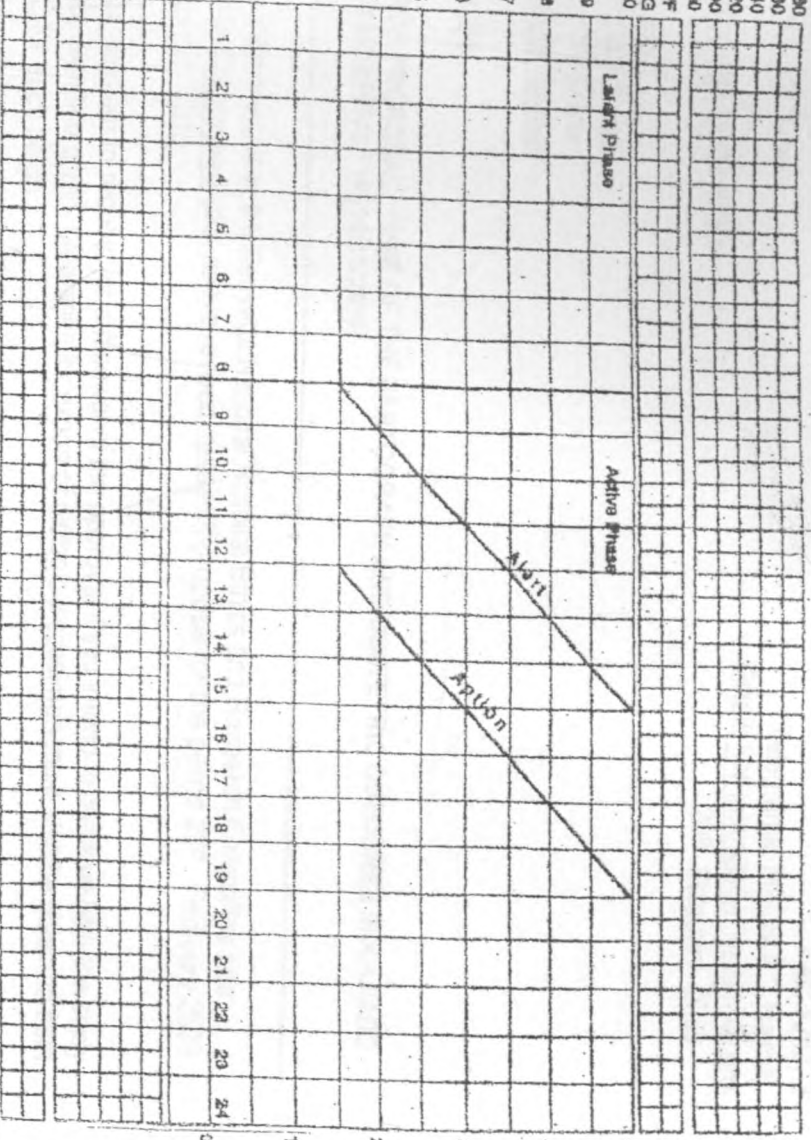
Name: ..... Age: ..... Gravida: ..... Para: ..... IP No: .....  
Date of Admission: ..... Time of admission: ..... Ruptured membranes: ..... Hours on admission: .....

Fetal Heart Rate 180  
160  
140  
120  
100  
80

LABOUR C/B/M/F Moulding 10

CERVICAL DILATION (CM) PLOT X

CONTRACTIONS PER 10 MINS  
A 20  
B 15  
C 10  
D 5  
E 0  
F 0  
G 0  
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 20<sup>th</sup> February 2009

Ref: KNH/UON-ERC/ A/151

Dr. R.K. Bor  
 Dept. of Obs/Gynae  
 School of Medicine  
 University of Nairobi

Dear Dr. Bor

**RESEARCH PROPOSAL: "USE OF THE PARTOGRAPH AND OBSTETRIC OUTCOMES IN KAJIADO DISTRICT HOSPITAL" (P296/11/2008)**

This is to inform you that the Kenyatta National Hospital Ethics and Research Committee has reviewed and **approved** your above revised research proposal for the period 20<sup>th</sup> February 2009 – 19<sup>th</sup> February 2010.

You will be required to request for a renewal of the approval if you intend to continue with the study beyond the deadline given. Clearance for export of biological specimen must also be obtained from KNH-ERC for each batch.

On behalf of the Committee, I wish you fruitful research and look forward to receiving a summary of the research findings upon completion of the study.

This information will form part of database that will be consulted in future when processing related research study so as to minimize chances of study duplication.

Yours sincerely

**PROF. C. KIGONDU**  
**AG. SECRETARY, KNH/UON-ERC**

- c.c. The Chairperson, KNH/UON-ERC  
 The Deputy Director CS, KNH  
 The Dean, School of Medicine, UON  
 The Chairman, Dept. of Obs/Gynae, UON  
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 Dr. G. Jaldesa, Dept. of Obs/Gynae, KNH