

A photograph of a newborn baby lying in a hospital bed, wearing a white cap. A healthcare professional's hands are visible, using a stethoscope to examine the baby's chest. The image is overlaid with a semi-transparent teal filter.

KNOWLEDGE &
PLACE
Policy Report

Maternal HDU

University of
Salford
MANCHESTER



MULAGO
HOSPITAL



The Sustainable Volunteering Project

Project Review Report June 2014

Maternal HDU Mulago National Referral Hospital Kampala - Uganda

Prepared by:

Dr Jack Milln

With support from the Liverpool-Mulago Partnership

© The University of Salford (2014)

The text of this document may be reproduced free of charge in any format or medium providing that it is reproduced accurately and not in a misleading context. The material must be acknowledged as University of Salford copyright and the document title specified. Where third party material has been identified, permission from the respective copyright holder must be sought.

The SVP project is funded by the Health Partnership Scheme which is managed by The Tropical Health & Education Trust (THET) on behalf of the Department for International Development (DFID). Any views represented in this report are those of the author.

Any enquiries regarding this publication should be sent to:
h.l.ackers@salford.ac.uk

Forward

I have been greatly impressed by the work that occurs on the Maternal HDU in Mulago, as evidenced by clinical accuracy and patient-centred care. HDU is a tribute to what can be done in the resource-stretched setting and the department of obstetrics and gynaecology should be proud of what they have achieved since the unit was set up 4 years ago. There are of course ways in which the unit may be improved, but these are fine details. We must first celebrate the huge number of very unwell mothers who return home after being cared for in the HDU. Whilst young mothers still continue to die in this setting, much of this is a due to a lack of robust health infrastructure in the community rather than in-hospital care.

I feel that there is nothing to stop the staff of Mulago implementing the changes recommended so long as strong leadership is provided. The formation of the HDU was primarily an initiative of staff of Mulago Hospital. Previous changes such as the initial AMEWS implementation and the standards of infection control have also been the initiative of Ugandan staff. Not only does this make the HDU an example of good practice, it also proves that high quality work can be achieved by local staff. We must encourage changes from within if we are to make a sustainable difference to the care that is provided to women on HDU.

I thank everyone in the Department who has made me feel so welcome over the last three months. I must thank Sister Anne in particular for making me welcome on her unit, and the area manager for her great leadership on 5c. I have gained a great deal of invaluable obstetrics experience from all the SHOs and interns which I look forward to using over the course of my career. I thank Professor Byamugisha for his guidance and for giving me the opportunity to work with the staff of the maternal HDU. I will take away fond memories of the friends I have made and the work that has been done.

Dr Jack Milln

July 2014

Executive Summary

This report summaries the work undertaken by a UK volunteer (Dr Jack Milln) who was placed on the Maternal HDU in Mulago Hospital for 3 months from May 2014. His placement was funded by the Liverpool-Mulago-Partnership. HDU itself was set up in 2010 by LMP with funding from the Tropical Health Education Trust (THET). Dr Milln spent 3 months on HDU and during that time took the opportunity to review its operation and successes.

Continued Success

The most important finding was that the HDU continues to play a major role in supporting mothers in a critical condition in Mulago Hospital and reducing maternal mortality.

Human Resource Challenges

The review identifies critical human resource issues that are impeding the operational impact of HDU. These include concerns about overall staffing especially out-of-hours and about the presence of senior staff and specialists on HDU. The lack of presence of senior staff is a major concern resulting in extremely long delays in patients being assessed.

Linked to, but not reducible to staffing problems, the review also found significant 'slippage' in terms of the practice of taking patient observations. Observations are not taken at recommended intervals with many patients waiting 3-6 hours for observations.

Equipment was only a part of this problem and the equipment problems themselves were very minor. Attention by hospital technicians with funding provided for spare parts and training in how to clean equipment would remedy the situation.

That said, it was not clear that midwives on the ward fully understood the value and meaning of taking observations.

In addition to staff shortages a number of areas were identified for staff training through continuing professional development.

Supplies, Investigations and Consumables

The timely supply of blood, blood products and investigations continues to cause delays. Overall supplies to HDU remain extremely good.

Recommendations

1. Provide further training around the management of sepsis to midwives and doctors
2. Senior management to review the appropriateness of caring for primarily medical conditions on the maternal HDU
3. Discussions on a senior level between heads of department regarding inter-team consultation requests.
4. Re-enforce the night time duties of the Senior House Officers (SHOs) on labour suite team
5. Ensure that a named SHO is always responsible for HDU (including during exam periods)
6. Discussions should take place at senior level regarding attendance by specialists
7. Further training of midwives regarding the essence of vital signs observation
8. Re-introduction of the AMEWS Maternal Early Warning Score system
9. Measurement of respiratory rate and temperature as standard.
10. Training of staff regarding modes of oxygen delivery
11. Procurement of simple oxygen delivery equipment
12. Increase pressure on hospital management to resolve blood supply issues
13. Provide training to staff on blood safety
14. Advise to interns regarding the use of the clinical laboratories during their induction to the OBGYN rotation.
15. Ensure availability and awareness of the laboratory handbook on HDU
16. Ensure that serostatus is known in 100% of HDU admissions as standard
17. More rational staffing of the HDU
18. Specific consideration should be given to possibility of formulating an amendment to the LMP MOU to ensure that staff are not moved from their position for at least 3 years post training
19. On-going attention to continuing professional development
20. Introduction of a simple to use medication chart
21. All medications to be administered by staff not attendants

Introduction

The Liverpool-Mulago Partnership (LMP) is an established link between the largest maternity units in Europe and Africa respectively. Mulago Hospital is Uganda's national referral hospital with more than 30,000 deliveries per annum. Liverpool Women's Hospital is one of the largest women's hospitals in Europe with over 8,000 deliveries per annum. LMP has been running since 2008 with the aim of mutual training and service development (www.lmpcharity.org)

In 2010 one of the Mulago obstetricians (Dr Muyongo) spent some time at Liverpool Women's Hospital. On his return to Mulago he identified the need to set up an obstetric high dependency unit (HDU) in Mulago to help reduce the maternal morbidity and mortality associated with critically ill obstetric patients.

The HDU is a 6-bedded ward area for patients requiring more intensive observation, treatment and nursing care than the unit is currently able to provide on the central labour ward.

Funding for the HDU was obtained from THET (Tropical Health Education Trust) in September 2010 for a period of 22 months. The HDU opened and started to receive patients in October 2010. To date, the HDU unit has provided high quality health care and has prevented deaths in women with pregnancy complications such as eclampsia, hemorrhage and ruptured uterus.

It is now almost 4 years since the unit was set up, and the funding and management of the unit has since been transferred to the hands of Mulago hospital and its staff.

Strong links have remained with LMP including a series of visits to the UK funded by LMP and the Commonwealth Professional Fellowship Scheme.

Most recently, in 2014 two midwives from the HDU spent 3 months in the UK. Barbara Mukisa and Rose Amede completed a Diploma in Reproductive Health at the Liverpool School of Tropical Medicine.

In April 2014 LMP placed a volunteer, Dr Jack Milln (FY2 doctor) on the unit for a period of three months to support the Unit and undertake an evaluation of current work. This report presents the findings of that evaluation.

Objectives

The aim of the placement was to evaluate current work on the unit, highlighting areas of achievement and areas for improvement and to formulate a series of recommendations for implementation by Mulago Hospital.

This report coincides nicely with the formation of a new Quality Improvement Team on the HDU. The initiative has been taken by Barbara Mukisa and Rose Amede, inspired by their experiences on the LSTM Diploma in Reproductive Health. The team consists of themselves, Sister Anne (nurse in-charge) and Dr Martyn Adupet (specialist in-charge). This team is hoping to implement changes in management and care, and assess whether changes have made a sustainable difference. They will continue to be supported and mentored by the links they have made with LMP.

I firmly believe that for sustainable change to occur, changes must be implemented by staff who are going to be working on the unit long term, and have a real interest in creating a unit that provides quality care to the many Ugandan women who find themselves at the extreme end of suffering. I am in no doubt that the staff working with the maternal HDU have the expertise, time, resources, and personal motivation to implement all the changes that I recommend. I see no need for any healthcare workers to travel from overseas to implement these changes. It is the choice of the staff at Mulago whether or not they would like to implement these changes, as they have ownership of this very important unit.

(Dr Jack Milln, LMP Volunteer, 2014)

Methods

Dr Milln's first step was to spend an extended period of time on HDU, working closely with doctors and midwives, to understand the ways in which they work and the challenges they face. This was achieved via daily involvement in clinical work on HDU for 3 months (April-June 2014).

During the first month Dr Milln worked with colleagues to prioritise areas in order to focus data collection processes. During this time and subsequently he spent time talking to staff on the unit to try to understand their thoughts and experiences.

The second two months were spent collecting data on all admissions through HDU and compiling the results. This included retrospective data collection to identify trends. The report also refers to data collected as part of the reporting requirements at the end of the THET grant. This covers the time between the opening of HDU and the grant end (October 2012-April 2012).

1)Retrospective Data Collection - January 2013 to April 2014

This included monthly data on admissions and mortality as recorded on the ward. However, this data is not collated by clinicians. As such it is fairly 'raw' and contains some inconsistencies.

It is important to note at this point that when HDU was first set up the Unit was provided with a PC and system in place to prevent virus damage. However this system has since broken down and data is no longer collected systematically on the ward using the PC.¹

2)Prospective Data Collection - May 2014 to June 2014

Data was also collected in real time on all women admitted to HD and included the following variables:

- Admitting diagnosis
- Age
- HIV status
- Time of admission
- Time to be seen by doctors – by status – including Interns;² Senior House Officers (SHOs)³ and Specialists (Consultants)
- Admitting observations
- Blood test results
- Length of stay
- Frequency of observations recorded on days 1, 2 and 3
- Time taken for investigations
- Blood products used, and delays in acquisition
- Unavailable medications
- Delays in obtaining consultations from other medical teams

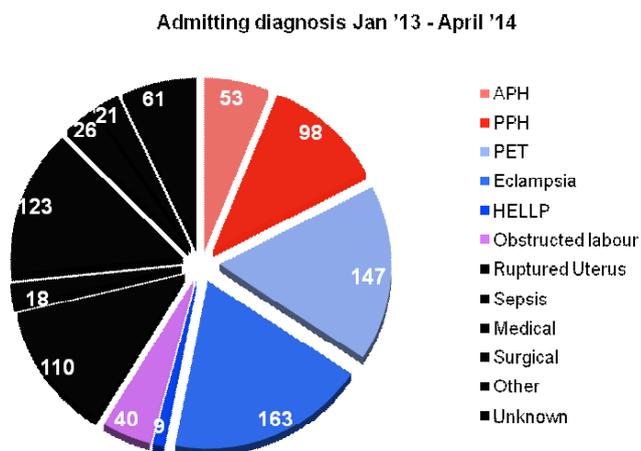
¹The PC remains on the ward despite lack of use. This is typical of much equipment in Uganda. For further details see (bio medical report)

²Interns are qualified doctors at the early stage of their training.

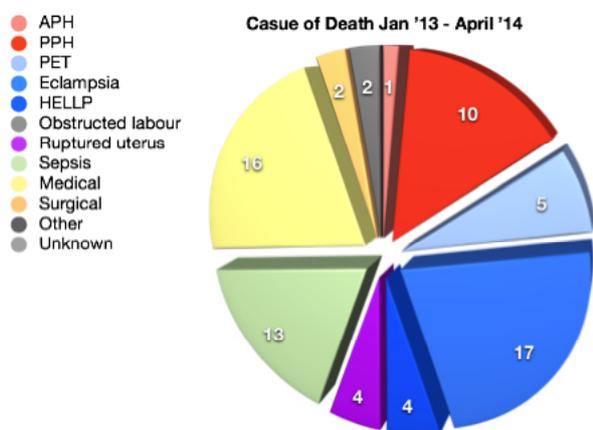
³An SHO in Uganda is an experienced doctor who has returned to Mulago Hospital to complete their Masters level training.

Retrospective 16-month data ²

There were 869 admissions to the maternal HDU between 1st January 2013 and 30th April 2014:

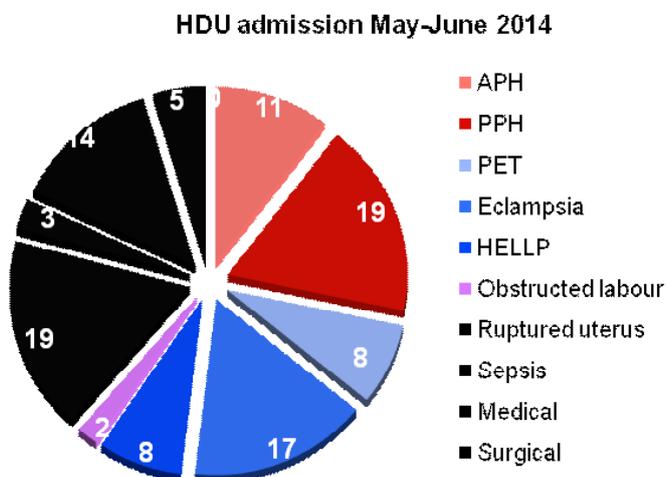


Over this 16 month period there were 74 maternal deaths:



Prospective 2-month data

There were 106 women admitted to the unit over a period of 8 weeks (1/5/14 - 23/6/14):



Results

1) Retrospective 16-month data

Causes of Admissions⁴

869 women have been admitted to the maternal HDU between 1st January 2013 and 30th April 2014. A total of 106 women were admitted to HDU during the observation period (1/5/14 - 23/6/14). The causes of admission are displayed below:

The two sets of data indicate similar trends and identify the significance of bleeding disorders, hypertensive disorders, and ruptured uterus which together comprise over three quarters of admitting conditions. During the study period there were only three cases of sepsis. Over this 2 month period there were 14 cases in which a medical (rather than a pregnancy-related) condition was the primary admitting condition. Other obstetric cases had medical complications too

During the study period the average age of women was 26.1 years. Ten of the cases were known to be HIV positive (36 were unknown):

HIV status	
+ve	10
-ve	62
Unknown	36

Maternal Deaths

Over this 16 month period there were 74 maternal deaths (8.5%). This figure is slightly higher than that recorded for the first 2 years of the HDU. From the opening of HDU in October 2010 until April 2012 there were 1361 admissions (around 70 a month) and 90 deaths giving a death rate of 6.6%.

The causes of death are displayed below. Hemorrhage, eclampsia, ruptured uterus, obstructed labour and sepsis feature strongly amongst causes echoing the findings of the 2012 Evaluation.

⁴The admitting diagnoses and cause of death were recorded by a non-clinician. As such there has been some ambiguity regarding the actual cause of admission. For example the cause may be recorded as 'retained placenta'; the admitting condition could feasibly be PPH or sepsis. Where possible we have exercised discretion. In other cases these have had to be classified as 'Unknown.'

	Primary cause of death	Number
Hypertension	Eclampsia	19
	Pre-eclampsia	5
Haemorrhage	PPH	17
	Abruption placenta	2
Obstructed labour	Obstructed labour	1
	Ruptured uterus	7
Infection	Sepsis	12
	Malaria	3
	Pneumonia	5
	HIV	2
Anaemia	Anaemia	7
Medical disorders	Renal failure	5
	Cardiomyopathy	1

During the 2 month study period there were 7 maternal deaths on the unit.

Summary of Causes of Death

Case 1 HIV Positive mother with Meningitis.

This was a difficult case to manage. She had an emergency section at 26 weeks gestation. Her condition prevented us from obtaining a CSF sample and without this the physicians would not attend. She spent 6 days on the HDU without a physician consultation and suffered aspiration. It took 5 days to get a CT. Apart from simple post-operative wound care, there was no reason that this lady should have been cared for on the HDU and would have been better looked after on the infectious diseases ward with obstetric input. The specialist attended early into her care on the HDU.

Case 2 Post-Partum Hemorrhage

This lady was admitted from the community with massive PPH. She was unconscious on arrival in severe hypovolemic shock. She was seen immediately by the SHO but did not respond to resuscitation. A specialist did not attend, possibly because this was a Sunday.

Case 3 HELLP syndrome with DIC

This lady was admitted from the community. She was already in DIC (Disseminated intravascular coagulation) on arrival and did not respond to resuscitation. There was a delay of 2 hours obtaining blood products as there were no staff at the blood bank. The SHO was in immediate attendance, and the labour ward specialist attended to her care after 1 hour of admission.

Case 4 HIV Positive mother with Meningitis.

This lady was carrying an early pregnancy. She was admitted in severe septic shock with the CNS as the most probable focus of infection. This was an unfamiliar condition for the obstetricians looking after her. There was no SHO due to exams and the specialist attended her care 15 hours after her admission.

Case 5 Peritonitis due to perforated bowel

This lady was admitted from gynae theatre. She had a necrotic tubo-ovarian mass removed. There was also faecal peritonitis but a source of perforation was never found. She was admitted in severe septic shock, was attended by the labour suite SHOs overnight, but succumbed to overwhelming sepsis before specialist review.

Case 6 HELLP syndrome and DIC

This lady was admitted with HELLP syndrome. She was in a stable condition on admission with no bleeding and was seen by the specialist in 3 hours. She developed PV bleeding and DIC overnight and there was some delay in obtaining blood products.

Case 7 Ante Partum Hemorrhage

This lady had a massive hemorrhage due to placenta praevia. She continued to bleed after an emergency caesarian section. By the time she came to HDU her BP was not recordable and she was in DIC. She died 45 minutes after arriving on the unit. She was also HIV positive.

The case summaries presented above identify a number of challenges facing HDU. The first is the fact that many mothers arrive already in a very serious and often very complex condition. The second concerns the presence of experienced doctors on the ward and the delays that women face whilst waiting for such specialist attention. The third concerns the problems facing HDU in accessing blood products in a timely fashion. Finally, the cases raise the question of appropriate use of HDU. These issues are discussed in more detail below.

Human Resource Issues: The Presence of Doctors on HDU

One of the core rationales supporting the setting up of a HDU in Mulago Hospital was the importance of providing more dedicated specialist care to critically ill patients. Whilst the provision of facilities and equipment are important, human resource is central to success. The 2012 report highlights the attention to staffing in the initial setting-up period:

The HDU opened and was fully functioning on 15th October 2010 with funding from the Tropical Health Education Trust. High risk patients who fit strict admission criteria are put into this 6 bedded monitored area with a minimum nursing: patient ratio of 1:6. Regular observations are performed every 30 minutes.

The report then referred to staffing levels achieved in 2012:

'The HDU initially only had 4 dedicated midwives (all trained in Liverpool through the LMP exchange programme), but with additional cover from the Labour suite midwives. However in June 2011, 7 midwives and 1 intensive care nurse were employed by the Ministry of Health specifically to staff the HDU, demonstrating their commitment to the project. There are now currently 10 midwives working in shift on HDU. On average there are three midwives working during the day shift, two on the evening and two on the night shift. There is also a team of doctors who review the patients daily. They include a specialist, senior house officer, and an intern. The HDU has made it easier to employ doctors from different specialties to review the patients.'

The review presented an opportunity to re-assess the human resource situation.

During the 8 week observation period there was an even spread of admissions throughout the day and night.

Time to be seen by Senior House Officer (SHO)

The review suggested very patchy cover by senior house officers on HDU with no SHO cover at all for most of the time.

During the 8 week period there was an SHO on the unit for only 3 weeks. From 19th May to 7th June SHOs were busy with the examination period for medical students. And from June 7th there was no SHO timetabled to work on the HDU. During this period it was expected that the SHO covering the nearby labour suite would also cover the HDU. However, no SHO was seen on the HDU during this period.

This patchy presence of SHOs made it difficult to provide data on the time taken for a patient to be seen by an SHO.

The data on time taken for patients to be seen by an SHO was only relevant for a 3 week period. During these 3 weeks it took an average of 6.6 hours (n=35) for SHOs to attend to new admissions on the HDU.

There was a difference for in-hours and out-of-hours admissions. Those women admitted in-hours were seen in 3.0 hours (n=17) on average, and those admitted out-of-hours were seen in 10.1 hours (n=18).

During the 5 weeks that SHOs were absent from the unit, the Intern doctor was dependent on the specialist for senior support.

Time to be seen by Specialist (Consultant)

Of the 106 women admitted to the unit over the 8 week observation period, 45 were seen by a Specialist obstetrician. Specialist presence on the ward varied considerably depending on the individual specialist. Some specialists saw all the women on the unit during their duty and were present on the ward once or twice a day. Others did not visit the unit at any time. Some of these were even difficult to contact by phone.

Of those women seen by the specialist, the average time to be seen from admission was 24.9 hours (n=45).

During the period that no SHOs were on duty, 22 of the women admitted were not seen by a specialist or an SHO. These women were attended to by the Intern alone. Data on interns was not collected but observations suggested that most patients were seen by an intern within an hour.

Time to be seen by Doctor (hours)		
SHO	In-hours (8am - 5pm)	3.0
Out-of-hours	(5pm - 8am)	10.1
pecialist (45/106)		24.9

External Consultations

Fourteen requests for external consultations were made during the two months. All were requests for attendance by medical teams (nephrology, neurology, cardiology, pulmonology, and endocrinology). Six of these requests were satisfied between 24-48 hours, and 8 of these requests were satisfied after a period of over 48 hours.

It was common for several requests to be made before a medical team attended. Problems cited were the system of consultant request (from intern to intern, with the medical intern required to convey the urgency to a specialist about a patient they had not met) and the lack of continuity of specialists (due to rotations and absences):

Consultation requests (n=14)

< 48 hours	6
> 48 hours	8

Patient Observations

As noted above the observation protocol agreed during the first 2 years of the HDU required observations being conducted at 30 minute intervals. The review suggests significant slippage in this objective. Table X presents data on the frequency of observations on 3 observation days. The results suggest that patients are observed less than once every 3 hours and often only at 6 hourly intervals:

Frequency of observations (average number of hours between each recorded observation):

Day 1 (n=78)	3.3
Day 2 (n=34)	4.9
Day 3 (n=16)	6.2

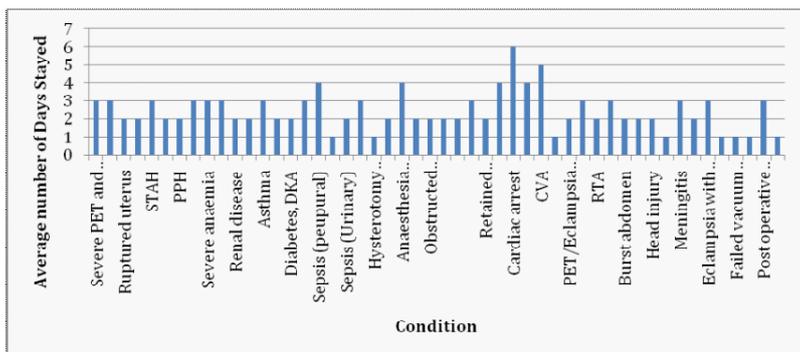
Length of Stay on the HDU

Chart X presents data for length of stay by condition. The longest stays were for patients with medical conditions followed by HELLP and then sepsis:

Length of stay (hours) - Average:

APH (n=10)	31.6
PPH (n=18)	20.2
PET (n=8)	30.4
Eclampsia (n=15)	52.4
HELLP (n=6)	128.8
Ruptured uterus (n=17)	29.4
Sepsis (n=3)	93.3
Medical (n=12)	165.4
Surgical (n=4)	29.2

Similar stays were reported in the 2012 report (covering the period from October 10th to May 2012). At this time the average stay was about 2 days:



Investigations

As with many facilities in Uganda, blood continues to present major problems and the lack of timely blood supplies is a serious factor contributing to maternal deaths.

During the study, blood results were rarely available within 24 hours. The interns felt they had little power in obtaining results more quickly even in emergencies. It was difficult to quantify the time taken for investigation results as the time of blood collection, delivery of results, and availability of results were not always measurable.

Blood Products

Requests were made for 96 blood products during the two month period. 75 of these 96 requests were satisfied. Of the requests satisfied about half suffered delays of at least 6 hours. Reasons cited for the lack of blood products or delays included:

- No blood products in the blood bank
- No staff in attendance at the blood bank.
- Inefficient use of existing services .

Medication

The 2012 report noted the success of HDU is establishing access to supplies. This continues to be the case. Nearly all of the major medications used were in stock. On a very small number of occasions families were asked to buy certain medications from the pharmacy which they were able to do without a problem. Shortages were apparent at some times (including Pisa (piperacillin and tazobactam), co-trimoxazole, and phenytoin).

Analysis and Recommendations

1) Admitting Conditions, Maternal Mortality and Sepsis

As one would expect, bleeding disorders, hypertensive disorders and disorders of obstructive labour make up the majority of admissions. Surprisingly sepsis was a relatively rare cause of admission during the study period.

A large number of women with primarily medical conditions were looked after on HDU. These were cases where a medical condition, such as pneumonia or meningitis in a pregnant woman, was the primary cause of admission, and does not account for the many medical complications suffered by women admitted for primarily obstetric conditions, such as renal failure secondary to eclampsia.

Whilst it is always tempting to take mortality data at face value it is important to appreciate the number of women admitted to the HDU who recovered with appropriate management and were discharged home. Of the 106 admissions in May and June, 101 (95%) women with serious and life-threatening obstetric conditions were discharged home. This is a great achievement and a huge credit to all the staff that work on the unit.

When assessing the cases of maternal mortality it is clear that they share a common characteristic: little could have been done to reverse the pathology. Two of the cases were already in established DIC, another developed DIC soon (JACK can you describe what DIC is) after arriving. Two cases involved advanced meningitis in HIV positive women. The condition of two cases of severe hypovolaemic and septic shock would have been difficult or impossible to reverse even in the most high-tech HDU settings. The pathology was far advanced in these women, long before they arrived at the hospital.

Some points may be taken from the retrospective mortality data.

The 16 month data reveals a disproportionate number of deaths attributable to sepsis (72% mortality) and medical conditions (13% mortality). It is impossible establish the reasons for mortality in these cases without looking at the cases of maternal mortality in detail. For example, are the reasons due to inadequate management or the inherent nature of the condition in that women with severe sepsis are admitted to the HDU at a late stage with very little chance of recovery?

Severe septic shock is an extremely difficult condition to manage and causes high rates of mortality even in the resource-rich setting (mortality rate of 20–40%, rising to around 60% if septicemic shock develops).

However, we cannot discount the possibility that the infrequency of admissions due to sepsis and unfamiliarity with the condition are also contributing factors.

Observation of the management of severe sepsis on the ward suggests that principles of aggressive fluid management, for example, are not appreciated.

RECOMMENDATION

Provide further training around the management of sepsis to midwives and doctors

2) Medical Cases

The HDU looks after a large number of women with a variety of medical conditions either in pregnancy or the puerperium. These conditions are often complex and unfamiliar to the clinicians looking after them. Medical conditions account for a disproportionate number of maternal mortalities and a disproportionate amount of bed usage on HDU.

It is important to consider whether the maternal HDU is the best place to look after these women.

On balance it may be. Although the expertise may not be as readily available, women on the HDU are benefitting from a superior nurse to patient ratio, a cleaner clinical environment, and treatment options such as oxygen. However, it is often very difficult to get medical teams to offer specialist expertise on the unit.

The data suggests that it take more than 48 hours for most medical teams to come to the unit, and this is usually after several visits by the intern to remind them.

There needs to be discussion at a high level about whether this is appropriate or not, and if there is a better way of streamlining the process.

There have been several occasions when the medical specialist is unaware that his expertise is required, the request having been held up by interns or SHOs who are rotating between teams and do not understand the clinical situation themselves.

This delay in specialist consultations is a very real problem.

RECOMMENDATIONS

2. Senior management to review the appropriateness of caring for primarily medical conditions on the maternal HDU

3. Discussions on a senior level between heads of department regarding inter-team consultation requests.

3) Coverage by Doctors

Dr Milln observed the tireless work put in by interns and SHOs, not just on the HDU, but across the entire department of obstetrics and gynaecology. The interns on the HDU made themselves readily available throughout the working hours, 7 days per week. There was never any issue regarding their whereabouts and no concerns regarding their work ethic. They demonstrated their ability to manage very unwell patients considering their level of training. During the 3 weeks that SHOs were on the HDU rota, there were no problems with coverage.

Whilst day coverage of the HDU was good, there is room for improvement regarding out-of-hours coverage. New admissions between 5pm and 8am waited on average 10 hours to be seen by an SHO. At times there was just one midwife looking after unstable patients overnight, and patients are often admitted in a highly unstable condition.

This places significant pressure on midwives at these times when they are expected to manage patients without a formal admitting review. The instructions on the post-operative form are often unclear, and a patient's condition is likely to change significantly during the 2 or 3 hours between the operating room and the HDU.

Midwives find this experience intimidating, working through the notes themselves trying to make sense of the history and the management plan. Many of the staff on the HDU are trained as midwives and not nurses, which makes a formal doctor's review all the more important.

It is the job of the night labour suite team to cover the HDU but midwives find it very difficult to get doctors to come and review patients in the HDU at night, and it is a task that they fear rather than rely on.

During the (5 week) period when there was no dedicated SHO presence on HDU it was very difficult to get SHOs onto the unit.

The importance of having a nominated SHO on HDU cannot be overstated. The pressure that their peers can exert to help is stronger than the pressure midwives can exert to bring SHOs into HDU. Of the 107 women admitted to the HDU in May and June, only 45 were seen by a specialist.

RECOMMENDATIONS

4. Re-enforce the night time duties of the SHO labour suite team

5. Ensure that a named SHO is always responsible for HDU (including exam periods)

6. Discussions should take place at senior level regarding attendance by specialists

4) Duties of Midwives

Midwives are clearly working hard on HDU. However, discussions with them suggested that many felt that it could be a demoralising place to work. The patients are very sick and need a high level of care. The work required is more than that on other wards, at the same level of salary. There is no chance of extra remuneration. Staff take home emotional baggage seeing the distress of young mothers either their own age or their daughters' age. It is important to understand these challenges and their impact on motivation.

One of the main benefits of having a maternal HDU is the ability to monitor patients closely. This is done through observation of vital signs. The recording of these observations is a central role of the midwives.

When Dr. Milln arrived on HDU staff cited a need for monitors as one of the main things that could be improved on the HDU. In fact the monitors simply needed new leads. Two other mercury machines have also been repaired.

As noted above, the original HDU protocol stipulates every 30 minutes of the first 2 hours or for unstable patients, and every 2 hours thereafter. Whilst there has been an increase in the number of observations since installation of the two new monitors practice is falling short of this goal.

The tendency to focus on the process of taking observations tends to gloss over the real problems. It was clear on a number of occasions that midwives do not fully understand what these observations mean. There have been cases where deteriorating vital signs have been recorded without any action being taken, sometime for a number of hours. This is by no means a peculiar problem but a problem that is faced in units such as this all over the world. It was in light of this that the AMEWS (African Maternal Early Warning Score) was introduced at the start of the HDU project. AMEWS quantifies vital signs into a score which is easier to digest than the absolute values.

Although staff were trained in the use of the AMEWS scoring system but it has fallen out of use. The system is easy to use in its nature and design. Providing further training of midwives and doctors to encourage use of the AMEWS could be readily achievable with leadership from the within the unit.

⁸ It is commonly known that staff on labour ward receive remuneration from patients.

⁹ The 2 MindRay monitors have been re-installed on the unit. The condition of the wires and blood pressure cuffs had previously deteriorated over time. It had been postulated that cleaning with a caustic substance such as Jik may be the source of the problem. Spare parts have now been purchased by LMP. No system was in place to enable the hospital to procure these essential parts or prevent the damage. These issues are discussed in more detail in bio medical project report no

There has been much celebration of the two MindRay monitors that were requested and purchased as part of the HDU grant. However, some concerns have arisen over their use. Having a digital display of vital signs does take some of the thinking out of the process. At this point we move from 'observing' vital signs of a patient to simply 'recording' them.

Patients are no longer touched by the midwife or doctor taking their vital signs. Important information regarding things like peripheral temperature are lost, as are the more subtle benefits of the touch of a healthcare professional.

Observations suggest that the monitors may even detract from accurate measurement of vital signs. For the last two weeks my measurements of pulse rate were different to those recorded. With some investigation, for example) we found that the mean arterial pressure was being recorded on the treatment sheets instead of the pulse rate.

Whilst there is good recording of pulse rate and blood pressure, there are very few recordings of respiratory rate or temperature.

Respiratory rates are recorded inadequately throughout the world, despite widespread knowledge that this is the most sensitive measure of physiological disturbance.

It only takes 15 or 30 seconds to record and reveals a lot about a patient's condition through time. The respiratory rate is usually taken at admission but at no other time during their stay on the unit. This could be due to lack of knowledge about the benefits of such a measurement.

Temperature is also not recorded well. There is one mercury thermometer on the ward which takes time to use. Dr Milln provided a digital thermometer but did not witness this being used. The reason cited is fear of it being stolen.¹⁰

RECOMMENDATIONS

- 7. Further training of midwives regarding the essence of vital signs observation*
- 8. Re-introduction of the AMEWS system*
- 9. Measurement of respiratory rate and temperature as standard*

¹⁰ In 2012 LMP provided mini obstetric kits to 50 midwives in Mulago Hospital. These include digital thermometers. The project was not successful with kits going missing and failing to be used shortly after their provision.

5) Equipment and Medications

As noted above, the provision of equipment and supplies on the unit remains excellent. Much credit must be afforded to the sister in-charge. Supplies are constantly replenished and there is very rarely any shortage that does not originate at a central level. In fact staff from a variety of other wards come to the HDU to try and take advantage of the supplies there.

There is a shortage of oxygen delivery equipment on the unit. At present there are only some simple face masks (maximum oxygen delivery 28-50%) which are beginning to perish. There is currently no means of delivering high flow oxygen via a non-rebreathing mask (oxygen delivery up to 100%). This is a simple piece of equipment that can save lives. There is also lack of knowledge regarding the flow limitations of oxygen delivery via nasal cannulae (maximum delivery 24-40%). The bag-valve-mask (Ambu bag) resuscitation kit has also perished and would not be adequate to perform satisfactory ventilatory resuscitation.

RECOMMENDATIONS

10. Training of staff regarding modes of oxygen delivery

11. Procurement of simple oxygen delivery equipment

6) Blood Products

As we can see from the data, about three quarters of blood products requests were satisfied. At times the products were acquired after some delay. This has been dangerous on a couple of occasions when very large numbers of blood products were required and these have not been available, especially after hours.

In one case, blood of the wrong group was given to a woman on the HDU. She had an immediate transfusion reaction and the blood transfusion was stopped after a minimal infusion. Harm was avoided on this occasion but it brought to light the fact that there is no formal system of ensuring blood safety on the ward. There are multiple packages/guidelines/checklists on how to do this simply online.¹¹

RECOMMENDATIONS

- 12. Increase pressure on hospital management to resolve blood supply issues*
- 13. Provide training to staff on blood safety*

⁹ see: <http://www.who.int/bloodsafety/en/>

7) Blood investigations

Interns and SHOs had little awareness of the time period required for certain tests to be processed. Instant blood test results are not always necessary. If a woman has bled a lot and is haemodynamically unstable we know she needs a transfusion without a haemoglobin result. If a woman with HELLP syndrome is bleeding we know she needs platelets without doing a CBC. If there are some instances requiring immediate results it is for electrolyte disturbance in renal failure, something that is seen commonly on the HDU. For example a potassium level may be required, particularly without the use of an ECG machine.

Dr Milln visited the laboratories to discuss these issues with the senior staff. They have referred me to a comprehensive handbook they have developed ('Clinicians' Hand Book on the use of the clinical laboratories'). Indeed this contains information about the minimum time required to process certain samples, and the procedure to get these done urgently in the case of a clinical emergency. They assure me that staff there are on hand to deal with these urgent requests if the clinical scenario demands it.

RECOMMENDATIONS

- 14. Advise to interns regarding the use of the clinical laboratories during their induction to the OBGYN rotation*
- 15. Ensure availability and awareness of the laboratory handbook on HDU*

8) HIV Status

The serostatus of 36 of the 106 admissions to the HDU was unknown. The serostatus of all pregnant women should be known. Exposure prone procedures are not uncommon in the HDU setting and for the staff's benefit the serostatus of all women should be appreciated. This may be done either centrally or with ready-to-use test strips on the ward.

RECOMMENDATION

- 16. Ensure that serostatus is known in 100% of HDU admissions as standard*

9) Midwife training

Nearly all midwives on the unit cited a lack of training as one of the main reasons for lack of motivation and work satisfaction on the ward. Some of the midwives are dual trained as nurses, but most are not, and none of the staff are trained in critical care nursing. Most are interested in intra-partum care and not trained in the care of critically ill patients and areas such as tracheostomy care for instance.

Some nurses are interested in fields far removed from high dependency nursing, and others that are interested have been moved away to different units. I think that there needs to be a more rational approach to staffing on the unit, employing staff that are not only trained in critical care, but show an interest in working in that environment.

All midwives on the ward showed interest at the possibility of more training. One of the midwives recently attended a 2-day obstetrics which was run by LMP, the feedback of which was very positive.

As noted above, 2 of the midwives had recently spent 3 months in the UK on specialist training. These midwives also contributed to a dedicated program in emergency obstetric training provided by LMP in June 2014.

The 2012 Report on HDU identified serious concerns regarding the rotation of staff trained through the Liverpool Mulago partnership and with support from the British Commonwealth Professional Fellowship Scheme. Referring to the tendency to rotate midwives who have been trained – on some occasions even prior to their return to Uganda, the report noted:

'This is disappointing for the project as the 4 initial fully trained HDU midwives have since been relocated, these midwives all received training in intensive care and this has had a negative effect for the project. These midwives had training at LWH but upon their return they were posted to other wards, and as a result the training received has not directly benefited the HDU unit.'

Funding has just been obtained by the British Commonwealth Commission to train one of the midwives in infection control. The objectives of this midwife are to acquire knowledge and skills in infection control especially of the critically ill obstetrics and newborns patients by working with the staff in the Liverpool Women Hospital and with some tutorials with experts in Liverpool women's hospital.

¹² For details see Policy Report X

Since setting up HDU at least 6 midwives have spent time training in the UK at the expense of the LMP and the British Commonwealth Professional Fellowship Scheme. The practice of moving these midwives post training has a very negative impact on HDU, on the midwives themselves and LMP.

RECOMMENDATIONS

- 17. More rational staffing of the HDU*
- 18. Specific consideration should be given to possibility of formulating an amendment to the LMP MOU to ensure that staff are not moved from their position for at least 3 years post training*
- 19. On-going attention to continuing professional development*

10) Medication charts

Medication charts are not in use on HDU. Dr Milln encouraged their introduction. Presently medication requests are made in the 'Plan' section of doctor's notes in the patient file. It is then the job of the midwife to look back through the notes to see what medications are required. Different medications may be specified at different times. Sometimes medications are not given because the request was made some days ago in the notes and not re-iterated in the most recent doctor's note. This system is far from ideal. Another problem stems from the fact that whilst some medications are given by the midwives, other medications are administered by the patient's attendants. These are then not noted on the treatment sheet. It is sometimes very hard to distinguish which medications have been given and which have not.

All of these problems could be solved with the introduction of a simple medication chart. Inability to pay for printing such charts has been cited as a reason for their absence.

RECOMMENDATIONS

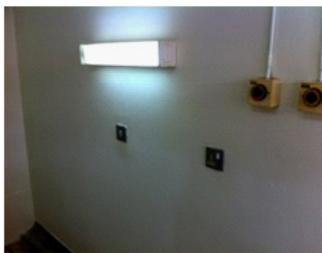
- 20. Introduction of a simple to use medication chart*
- 21. All medications to be administered by staff not attendants*

HDU RENOVATION

In June 2014 Dr Milln saw the renovation of the HDU funded by the LMP. It was a logistical challenge to move all patients and equipment to a remote site. The walls have been painted, lighting has been fixed, and running water re-established on the unit. The feedback regarding the renovation has been great.



Before:



After:

Appendix 1:

A typical day

I thought it was important to include some other information about the other work I was doing on the unit besides the data collection and evaluation. The LMP charity puts a lot of effort into ensuring that their volunteers work beside Ugandan staff, rather than instead of Ugandan staff. We refer to this way of working as co-presence. I have endeavored to adhere to this principle during my time on the maternal HDU. I hope that my description of a typical day provides more detail.

A typical day starts with the morning meeting in the department of obstetrics and gynaecology. All staff working that day are expected to attend. This is a forum for discussion around the previous day's activities and difficult cases. All maternal mortalities are discussed in detail. It is only right for LMP volunteers to attend the meeting to feel part of the Mulago team. The meeting is usually followed by the ward round on the HDU. This early round is normally led by the SHO, with the specialist reviewing patients later in the day. It is easy to see how an LMP volunteer doctor working on the ward could end up doing the job of the SHO. Not only would they have the skills but it is also attractive for any doctor to be in charge of a patient's management. It is however important that the local SHOs have ownership of their week long rotations on the ward. As I am not an obstetrician there was not really any risk of my taking on this role however I was able to work with the SHO in certain ways. The unit looks after many women with medical conditions, and many of the women suffer medical complications of their obstetric conditions. As a physician, and with a recent diploma in tropical medicine, I was certainly able to contribute my knowledge and experience in some of the areas that the SHOs felt less comfortable. I think that they appreciated this support, and I felt empowered that I was able to add something to the management of our patients there. For example we looked after a 26/40 pregnant lady who was HIV +ve with PCP pneumonia. The SHO was not familiar with this condition which comes under the specialty of infectious diseases. I was able to contact my colleagues at the Infectious Disease Institute (IDI) and formulate a management plan with them. This led to her recovery from this often fatal condition. I feel this was a good example of sharing knowledge and skills.

In the afternoons I would spend my time on either the admissions unit, labour suite, 5A annex admissions, or in theatre. During these times I felt I was certainly gaining more experience and knowledge from my Ugandan colleagues than offering service provision. Again, as I am not as confident in my obstetric skills as my medical skills, I was always working with the staff from Mulago. I always got the impression that the Ugandan staff were pleased to have me and other LMP volunteers working with them. Not only did we have good clinical discussions around patients, I think that they enjoyed the experience of teaching doctors less experienced than them. I know that I certainly learn a lot when I am put in the position of teaching, and I think they felt the same way. I also remember asking one of the SHOs if they felt we were a hindrance always asking them questions and they said: *'just having you (international volunteers) around is a source of encouragement for us, so we know that we are not alone in a place like this.'*

There were certainly many instances that I had to work with local staff during emergencies. I learnt a lot about the principles of co-presence from one of my colleagues, Dr Kate Lightly, who was previously a volunteer with LMP. We were looking after a lady with PPH and DIC whose condition was extremely unstable. I was dealing with the case in HDU and taken it upon myself to be at the centre of her care in giving blood products etc. The situation was quite stressful and I think I had become overly involved in the case and doing jobs that the local staff should have really been doing. Dr Kate Lightly came to review the patient. Without rushing in she took time to understand the story from the Ugandan staff. She then talked through the case with them so that they came up with a way of taking the management forward. She encouraged their ideas rather than enforcing her own. Instead of doing all the practical jobs herself she took on a more subtle role rather than front line role. It is often very easy to rush into emergency situations at which point the philosophy of co-presence is lost, and that's probably the trap I was falling into at that moment. I learnt a lot from Dr Lightly who has a great deal of experience in this position.

Working with local staff was probably the most enjoyable aspect of my time in Mulago hospital. I have learnt a great deal from them. Ugandan doctors take on a much greater weight of clinical responsibility early in their careers, and as such are often far more experienced clinicians early into their clinical training. I was honoured to be the recipient of their training in such areas and look forward to using those skills in the future. By their own admission Ugandan doctors do not have the same experience when it comes to data collection and evaluation regarding ward management. I was happy to share my skills in this area in the form of this report. I hope to work with many of the friends I have made in the future.