**Clinical implementation of an Emergency Department at Masanga Hospital**

**Doug Watts**



**Introduction:**

Masanga hospital is a former leprosy hospital located in Tonkolili district, Sierra Leone. Currently facilities consist of male and female surgical wards, a maternity ward, paediatric ward and refeeding centre. A medical laboratory is based on site, together with two operating theatres.

The need for an acute admissions unit has been identified by health workers from the charity Masanga UK. The plans consist of redeveloping an existing building on the hospital site to provide a clinical area which will deliver a higher level of care to unwell patients than is currently available. The unit is to be equipped to meet these needs, whilst operating in a resource limited context.

The development and running costs of the new unit will be met by Masanga UK. It is hoped that by fostering closer ties between the NHS hospitals in South West England and Masanga hospital, shared development will ensue, leading to individual and collective growth in the UK and Africa.

**Project objectives:**

- Describe the context in which the new unit will operate
- Explore the role of a new unit and how it could work in practice
- Implement a system of evaluation and audit for any intervention
- Discover the equipment needed and where it may be obtained
- Describe the running elements and quantify costs
- Explore the links and relationship between the hospital and the UK charity, PCMD and clinicians in the South West.

**Methods:**

I travelled to Masanga hospital in January 2012 for a period of 7 weeks. The following process was followed:

- Orientation
- Identifying stakeholders
- Informal and semi-structured interviews with stakeholders to identify needs
- Data collection
- Interpretation / report writing

**Summary of existing system:**

**Admissions**

- Most of the acutely unwell patients represent a wide range of medical and surgical pathology. The many of critically ill patients are children or women with obstetric related problems.
- Currently acutely ill patients are dealt with on an ad hoc basis. Patients present to the OPD (outpatient department) and are then either carried or wheeled to an appropriate ward. Triage is performed without observations by either the general public, administrative staff or occasionally the OPD CHO (Community Health Officer). Alternatively they present directly to the ward. Out of hours OPD is closed so patient present directly to the ward.
- Nursing staff will then take observations and contact the CHO who take the history, examine and commence treatment.
- Review by a doctor is then organised by the CHO if needed.

**Inpatient care - nursing**

- All patients are required to have a "caretaker" who provide personal care and food
- Food is provided for paediatric and obstetric patients
- "Nursing aids" provide nursing care, including taking observations, administering medications and treatments. The nursing aids have completed basic secondary education and a subsequent 10 month nursing course, which is run by the hospital.
- All patients have observations taken once daily, in the morning before the ward round.
- Nursing leadership is provided by two more experienced nurses (Patrice and Emma), who have completed a two year training course.

**Inpatient care – medical**

- Provided by at least two European doctors with training in tropical medicine / surgery / O+G.
- This is often reduced to one doctor, especially during the European summer holidays and Christmas when the doctors take turns to return to Europe.
- A doctor is oncall 24 hours a day and covers the hospital at weekends.
- Doctors perform ward rounds at least three times a week (Mondays / Wednesdays and Fridays) with troubleshooting rounds on Tuesdays and Thursday, when elective operations are performed.
- The majority of medical care is provided by CHOs (Community Health Officers), who have completed a two year course in basic inpatient and outpatient care. They are independent practitioners and prescribe.
- The STP (surgical training programme) means that the hospital is well supplied with fairly senior CHOs and occasionally Sierra Leonean doctors
- Out of hours, nurses will contact one of two CHOs who will assess the patient and request the doctor to review if appropriate.

**Laboratory**

- Situated in the OPD

- Tests currently available are: Haemoglobin, white cell count, blood cross match for transfusion, HIV testing, capillary blood glucose, urine dip stick, VDRL, malaria thick blood film, malaria antigen test, leprosy testing, onchocerciasis, stool microscopy, AFB, gram staining
- Out of hours usually limited to malaria antigen test, Hb and cross match for transfusion
- Limited amount of blood available but most transfusions are from patients relatives

**Pharmacy**

- Medicines are currently dispensed in the pharmacy for each ward patient
- Emergency drugs are kept in pharmacy with an emergency drug cupboard in the paediatric ward for out of hours use
- Medicine security is big problem in Sierra Leone in general and has recently become an issue at Masanga too.

## The role of a new unit

### Unwell admissions

Patients presenting to the hospital with acute problems requires rapid initial assessment, diagnostic tests and treatment. Currently the system is weakened by the lack of an established patient pathway, resulting in delays.

This is a system which could be improved, using an "Acute Admissions Unit" model. Patients should be rapidly assessed initially by well trained nurses, reviewed by medical staff who can easily organise appropriate tests and commence resuscitation with equipment that is immediately available. These patients should then be monitored closely to assess response to treatment. Patients can then be moved to an appropriate ward.

Multi victim RTCs are reasonably common and present a problem clinically and logistically, often overwhelming the adult surgical ward.

### High dependency care

There are a proportion of inpatients who are critically unwell and require care and monitoring which is currently beyond the scope of the wards of Masanga to provide. There are sometime delays in recognising such patients, especially out of hours. This problem is exacerbated by lack of equipment, low frequency of observations and lack of electrical power.

There is also a role for the care of some post-operative patients. Patients often return to a ward postoperatively following major surgery with reduced consciousness and abnormal physiology, with significant risk of postoperative complications. Currently ward care for such patients is suboptimal, due to lack of monitoring, inexperienced staff and poor/absent equipment. At least one recent post-operative death at the hospital directly attributable to infrequent observations in a patient who had bleeding and hypovolaemia that was not recognised. With the hospital performing increasingly ambitious surgery incidents such as this are likely to become more common. The creation of a "high dependency" unit would greatly improve surgical outcomes.

### General impression of the hospital

A widely expressed concern is that the first hospital building that is seen on entering the site is the shell of the proposed new unit. This gives the community a poor impression of the care that they will receive at Masanga. It also limits the hospital in its ability to gain credibility from governmental and non-governmental organisations, which is critical in order to meet certain long term strategic objectives, such as accreditation of a full nursing school.

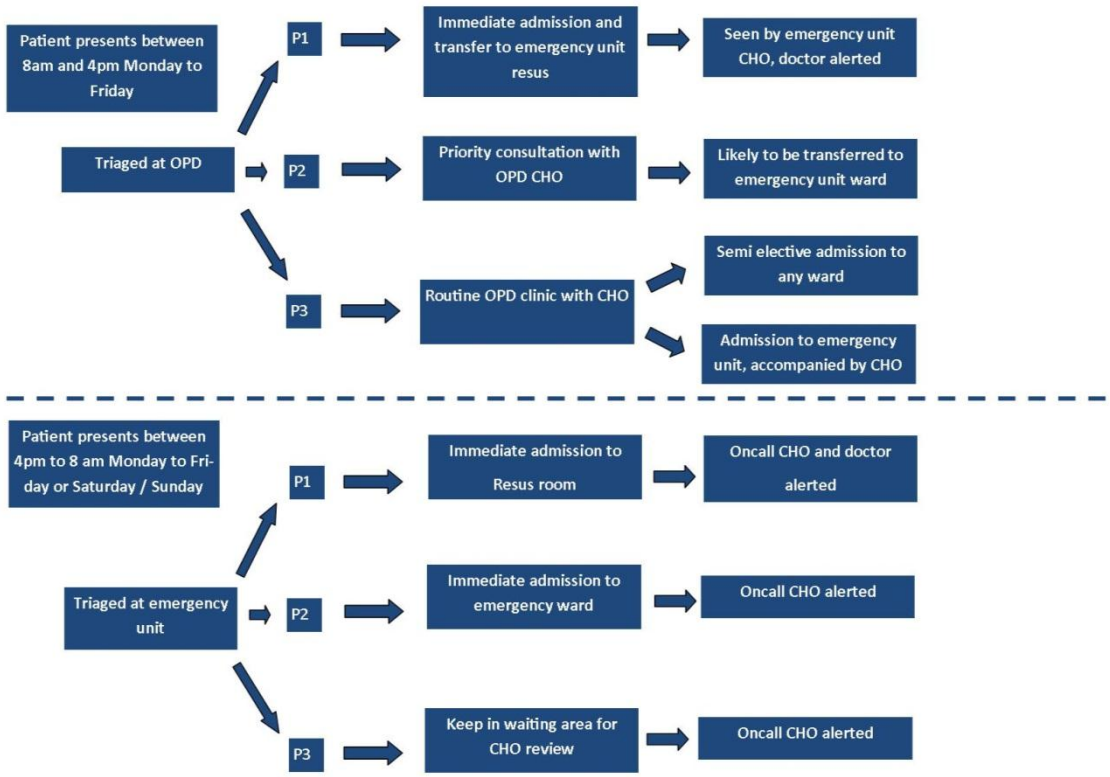
## How will the unit work in practice

The following are some notes on some considerations that need to be made on how the unit could be used in practice. These are deliberately brief as the exact details should be formulated and implemented by the local doctors and staff.

Flexibility is important – the hospital is seeing a rapid increase in patients due to its increasing reputation and the temporary closure of a nearby hospital.

**Triage:**

- Patients currently arrive to either the OPD or straight to the ward, effectively triaged by members of the public and other patients families.
- A nursing assistant working in OPD could check patients in, take observations and weight and could then triage patients in the OPD, either for the attention of the OPD clinical officers or straight to the acute ward.
- There is a potential issue of patients arriving direct to the acute unit when well and consuming nurses time




**Staffing – nursing**

- A new cohort of 25 will be available from October 2012. It is hoped by many that some of the cohort will be employed by the hospital
- The current nursing aid rota is intensive, ignoring weekends. Annual leave is addressed by each nurse taking one month off each year. Nurses are given 3 days off post nights, which

also count as weekend. Nurses widely consider the rota system far too intense considering the wage.

- Between 7 and 8 nurses cover each ward at the moment, resulting in two nurses during the day and one at night. Breaks are ignored if both nurses are needed.
- Staff absences are covered on an ad-hoc basis but often result in understaffed wards.

**Staffing - medical**

- Clinical officers keen to be involved in the care of acutely unwell patients
- Would like to spend time stabilising patient in a resus type setting before review by doctor
- Would find it helpful to have all unwell or new patients in one place overnight


**Ambulance:**

One ambulance arrived in Masanga at the start of February 2012. This is a Danish ambulance which has been modified for local terrain. No plan has yet been made as to how this gift should be utilised and how the running costs can be funded. If the ambulances are involved in the transportation of acutely unwell patients, then it is logical that the staff in the acute unit coordinate the ambulances activity. The acute unit should act as the ambulance hub.

However, the implementation of an ambulance service in Sierra Leone will be fraught with difficulties. Careful consideration needs to be given as to whether this service is an appropriate use of resources in the context of suboptimal hospital care.

**Evaluation and audit**

Currently, after a patient is discharged, clinical notes for that episode of care are either destroyed or placed in a highly inaccessible system. Records are kept for government statistics using books on each ward. These collect basic demographic data and are inputted by nurses. At the end of each month a doctor collates this information and submits it to the government. Some errors are produced in this system as it

In formulating a new system of data collection for research and audit it was recognised that in the context of great clinical need, the tools could not be labour intensive. The tools should attempt to increase standards and that implementing improved recording keeping would be a desirable secondary outcome. In conjunction with the local staff a new admissions form was produced, which collects demographic, clinical admissions data and clinical outcomes on one side of paper. After an initial evaluation period it was modified and has been implemented from 1st March 2012. A copy of the form is included in Appendix A.

The aim is to collect baseline data before the implementation of the new unit. This can then be compared with data from after implementation to measure the size of effect on clinical outcomes.

**Equipment needed**

**Non clinical:**

**Electricity:**

- Generator supplies all electricity for Masanga (hospital and surrounding buildings)
- Consumes approx. 4.5l diesel per hour
- Currently runs for 3 hours every evening 7 – 10pm
- Also runs when operating theatre is running, usually Tuesdays and Thursdays 10 - 5pm
- Staff and patient tend to use the hospital as a venue for recharging phones and laptops

The shortage of electricity is a challenge being faced by Masanga. There are several options currently being explored with the aim of a constant and secure supply:

- The building of a connection to main grid – likely cost at least 150,000 euros
- The building of a connection to a local hydroelectric generation project
- The development of a battery supply system for core clinical areas with low power lights

It is hoped that one of these systems will be available, but will take at least two years. If the new unit is to use equipment that requires electricity either the existing system of power supply will need to be accepted, or a new system developed. Firstly the demands on the system must be considered. The two most important demands will be lighting and monitoring:

- 240v lighting – cheap, familiar to install. However, energy intensive and inefficient to run from battery system.
- 12v LED lighting – more expensive but lower power consumption and longer life. Efficient to run from battery system.
- Traditional static monitoring equipment requiring constant 240v electricity - can make maximum use of existing and donated equipment. However, requires constant 240v electricity source, which is inefficient
- Mobile monitoring equipment – more flexible as can be easily moved to wherever it is needed. Likely to be built to be more resilient. Internal power supply useful as reduces need for constant 240v power. However, portability could be a security problem.

There are several options for electricity supply:

- Use the existing generator and provide a contribution to the running costs based on the additional generator hours used. The advantage of this is that there will be minimal capital expenditure, that it is based on a proven system and that the rest of the site will benefit. However, it may lead to reluctance to use monitoring equipment and a delay in the start-up of such equipment. The running costs are likely to be significant, in addition to be poorly sustainable and environmentally unfriendly.
- Use the existing generator to charge a battery bank which will then provide power 24 hours a day. A similar system is used to provide power to the blood bank fridge. The advantage of this system is that it requires only moderate capital expenditure and has the potential to provide 24 hour power. However, due to the constant battery cycling new batteries will

probably be needed every 2-3 years. The system would also be vulnerable to generator failure, which is not uncommon.

- Use the existing generator, together with photovoltaic cells to charge batteries, which will provide power 24 hours a day. The capacity of the photovoltaic cells should be sufficient to run all of the equipment and lights during daylight hours.

It should be noted that the operating theatre had a battery backup system which was charged by the generator and used an invertor to supply 240v. However, use of the ultrasound machine and staff recharging mobile phones resulted in repeated deep cycling of the battery and subsequent low battery capacity.

At this stage it seems that using the existing generator, together with photovoltaic cells to charge batteries offers maximum sustainability and resilience in the case of equipment failure. This should be in conjunction with LED lighting and portable equipment with built in batteries.

**Running water:**

- Considered essential by most staff, running water will improve hand hygiene in particular.
- Currently there is only running water in the operating theatre, which is supplied via high tanks located between the OT and the proposed unit. The water is pumped using an electric pump powered by photovoltaic cells.
- Utilising these tanks should require minimal external piping and minimal groundwork.
- There is on-going work to provide running water to the whole Masanga site.

**Telephone system:**

- Local staff have mentioned the need for a telephone system between the acute unit, OPD/lab and possibly the operating theatres and other wards
- The aim for such a system would be to reduce the time spent sending messages from the ward to the lab and pharmacy. The journey takes approximately 30 seconds, but would possibly result in the unit being unstaffed during this time.
- However, from observation, many of the messages sent are accompanied by a physical object, such as a blood sample or drug chart. Therefore a system might not significantly reduce time off the ward and might be used frivolously.
- I feel that the need for a telephone system has yet to be demonstrated but could be the subject of further investigation.

**Clinical equipment**

A full list of clinical equipment required for the new unit is listed in Appendix B. I have collected some equipment that may be useful and placed in X-ray, next to the new unit.

The following significant pieces of equipment are already in possession of the hospital and can be used in the new unit:

- USS machine
- 1 x 240v oxygen concentrator
- Portable O2 sats monitor recently donated from Norway

**Deliberate omissions**

- 12 lead ECG – no patients presenting with chest pain suggestive of MI during my 7 weeks at Masanga. Arrhythmias could be diagnosed using 3 lead monitor. Local staff cannot interpret 12 lead ECGs.
- LMA / ET tubes / Laryngoscope – after discussion with anaesthetic consultant who has worked in many developing countries and at Masanga. He felt that this equipment would be inappropriate currently and may lead to accidents

**Running elements and costs**

There is a question as to whether Masanga UK will be responsible for all of the running costs of the new unit, or only the costs which arise due to the presence of the new unit. Besides staffing, increased generator usage and disposables associated with new monitoring machines, there should not be any new costs incurred by Masanga hospital due to the presence of the new unit. Most of the expensive interventions (such as IV access and medications / fluids) will be given in the new unit whereas they would have been previously given on the ward. The total expense to the hospital should not increase, but the location where the expense occurs will change.

This section therefore will not attempt to estimate the use of clinical consumables and drugs, but instead the addition costs the new unit will occur.

**Core Staff**

The following list of staff numbers and role have been reached in consultation with the hospital administrators, senior nurses, doctors, CHOs and nursing aids.

1 x CHO

- To provide basic medical care and complete regular wardrounds
- Could be part of the STP programme, which may result in a higher calibre person but would increase turnover.

1 x SECHN (fully qualified nurse) **or** 1 x State registered nurse

- The hospital currently have 2 x SECHN, who provide nursing leadership and clinical care as part of the oncall CHO rota. It is part of the long term vision for Masanga to start employing state registered nurses, who should improve standards among the nursing staff and will be important to the development of a nursing school at Masanga
- An SRN would need a suitable house to be provided and may be difficult to recruit.
- An SRN will need to be offered at least the equivalent wage to the government hospital, which is approximately SL 1 million per month.

12 x nursing aid – acute unit

- Newly qualified nursing aids are currently paid SL 145,000 per month, but consider this far too low and will inevitably be increased soon
- More experienced nurses (although in many cases not obviously superior) are paid up to approximately SL 210,000 per month.
- There is no formal system of pay increments or recognising excellence
- Recruitment should be from both the existing nursing aid staff and from the new cohort of nursing aids that are due to graduate in October 2012, with a rota organised to mix newly qualified and more experienced staff
- Existing nurses who are selected to work in the new unit should have their excellence recognised with a modest increase in pay compared with their ward counterparts.

- An average cost of SL 170,000 per nursing aid is a generous estimate based on a combination of new nurses and more experienced nurses, including an allowance for a pay increase

1 x nursing aid – triage

- Working in OPD, taking observations of new patients and escorting the sickest straight to the emergency department
- OPD is open Monday – Friday, approximately 8am – 3pm. Triage in OPD would only occur during these hours.
- This role should rotated between all of the nursing aids, after adequate training and experience

**Example of possible nursing aid rota**

| | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|---|---|---|---|---|---|---|---|
| Nurse 1 | M | M | M | E | E | E | L |
| Nurse 2 | M | M | M | E | E | E | L |
| Nurse 3 | E | E | E | L | L | L | N |
| Nurse 4 | E | E | E | L | L | L | N |
| Nurse 5 | N | N | N | L | L | L | M |
| Nurse 6 | N | N | N | L | L | L | M |
| Nurse 7 | L | L | L | M | M | M | E |
| Nurse 8 | L | L | L | M | M | M | E |
| Nurse 9 | L | L | L | N | N | N | L |
| Nurse 10 | L | L | L | N | N | N | L |
| Nurse 11 | OPD Triage | OPD Triage | OPD Triage | OPD Triage | OPD Triage | L | L |
| Nurse 12 | Annual Leave | | | | | | |

Key:
M = Morning, 7:30 – 15:00
E = Evening, 14:30 – 21:00
N = Night, 20:30 – 08:00
L = Leave

1 x cleaner

- Although a small unit compared to the other wards, patient throughput will be high and hygiene will be important.
- A cleaner will work 6 reasonably short days a week and will be easy to recruit from the locality

**Employment costs**

All cost are estimates, based on current wages and are gross, in Leones, per month:

CHO: 600k

SECHN: 600k / SRN: 1 million

Nursing Aid: 170k

Cleaner: 150k

Total based on assuming SRN is employed = 4130 k per month = approx. £635 per month (exchange rate Jan 2012)

The hospital will organise the payroll and are happy to help with the recruitment process.

**Others costs:**

**Generator time**

The generator uses 4.5 litres of fuel per hour. The cost of 1 litre of fuel is approximately 4000 Leones.

**Maintenance**

Basic building maintenance can be performed by the construction team at Masanga. Repair of the electrical systems and equipment is more difficult and may require contractors from Freetown. However, frequently expertise is found amongst visiting volunteers.

It would seem prudent that money is set aside for the renewal of the building and equipment, to guarantee the continued running of the department. Small building repair projects would be best dealt with by the local team, but larger or more specialist projects, such as replacement of the roof or electrical system, should be funded by the charity to avoid degradation of the clinical operation.

Clinical electrical equipment, such as monitors, may have a shorter life at Masanga compared with Europe. Replacement units should be sent periodically, ideally before malfunction of the existing units, to ensure gradual upgrading of the equipment.

**Sources of equipment and consumables**

The hospital currently purchases clinical consumables, including many medications, from the IDA Foundation (www.idafoundation.org). It takes approximately 6 months for supplies to arrive in Masanga after placing an order. An order has recently been placed and the next order will probably not be placed until late 2012 / early 2013. The recent order may be amended if done soon – liase with Dr Alex.

Most large pieces of equipment are obtained in Denmark and shipped in a container. A container typically takes several months to reach Masanga. Approximately 2 containers are sent from Denmark each year and Denmark would allow Masanga UK to use container space. The cost of shipping directly from the UK to Sierra Leone is likely to be expensive and problematic at customs.

There are no reliable sources of medical equipment within Sierra Leone.

The cost of shipping items to Sierra Leone directly from the UK, or shipping items from the UK to Denmark is likely to be disproportionate to the value of the items. Utilising the Danish container may be the best option for larger items but it is unlikely the items will arrive to Masanga before next year. To me, the most realistic option is to utilise the generous baggage allowance given by airlines flying to Sierra Leone and to send volunteers with equipment.

## Links with Masanga UK

**Undergraduate medical students:**

The local team are keen to accommodate medical students from the UK and offer them a high quality placement.

Medical students require a large amount of the doctors time in order to benefit from working in such an unfamiliar environment. There are two doctors covering a 100 bed hospital, with approximately 500 outpatient presentations per week. Therefore doctors time is a commodity that needs to be respected and cannot be taken for granted. Taking doctors away from the clinical duties will have a detrimental effect on patient care and is therefore contradictory to the aims of the project.

The arrangement of medical student placements is challenging. There are number of points that need to be considered:

- Email access from Masanga is slow and frustrating
- Local doctors are busy and organising medical students who are arriving in the distant future can seem a low priority and may therefore be forgotten
- Doctors spend 2 years at Masanga, therefore a doctor who agrees to accommodate students may not be the same doctor who will be there at the time
- Communication via Masanga Denmark adds a further level of complexity and volunteers in Europe may not entirely understand the situation on the ground
- There are a number of medical schools which have links with Masanga. Some medical student volunteers work at Masanga for 6 months so it is likely that there will be other medical students at the hospital simultaneously
- Over the summer months it is common that one of the doctors will return to Europe to holiday, leaving one doctor to run the hospital.
- Better communication between Masanga UK and the local management team is necessary – local staff should review the practicalities of any projects before approval as they will have greater insight into the number of students that can be accommodated and what resources will be required.
- Vehicles are expensive are already quite fully utilised. If transport for a project is required then this needs to be discussed in advanced and will require financing.
- Any notion that a medical school or charity has an entitlement to the provision of student electives at Masanga is likely to isolate and harm relationships.
- The problem of students requiring the doctors time would be helped if accompanied by a supervising doctor with experience of working at Masanga or a developing country.
- Medical students should consider what they could give back to the hospital community. Projects which might be beneficial for both parties could include assisting with clinical audit and teaching CHOs / nursing aids.

**Links with hospitals in the South West:**

So far the clinical contribution from Masanga UK has been minimal, which is curious considering that Masanga UK is a charity with so much clinical expertise. A clear and supportive approach to UK volunteers traveling to Masanga is required to redress this and recognise the potential strengths of the charity.

Working in a setting such as Masanga is challenging for any clinician and the contribution that a doctor can make in the first few weeks is minimal. Local staff feel that there may be an overall loss to Masanga when volunteers visit for a period of less than 3 weeks, depending on the person.

Doctors in training programmes in the South West have a huge amount to contribute to Masanga hospital. Masanga offers the trainee an opportunity to work in an environment with incredible clinical variety, to see pathology unseen in western medicine and to build the resilience needed to work in a resource limited environment. There is an opportunity, made possible by the unique relationship between Masanga, the charity and the South West clinical community, to facilitate mutual benefit between trainees and Masanga hospital.

Because of the largely autonomous and unsupported nature of the work it would be inappropriate for most Foundation Programme doctors to spend short periods working at Masanga. The same is likely to be true for most core trainees who have not had previous experience working in similar environments.

**Masanga OOPE**

An OOPE (out of programme experience) is available for specialist trainees in most specialities. This is an agreed period of time spent outside of clinical training in the UK, often used to pursue research or to work abroad. Approval for OOPE programme is usually given prospectively and approximately 6 – 10 months in advanced. Most OOPE programmes last approximately 1 year, although they range from 3 months to 2 years. A period of at least 6 months is preferred by local staff and would result in a greater benefit to the hospital.

The Masanga OOPE programme should last between 6 – 12 months, be supported in principle by the Deanery and organised by the charity Masanga UK. The aims of the programme should include clinical experience, health service development, education of local staff and possibly research. Selection should be competitive, based on the skills and attitudes. For the successful candidate support should be given by Masanga UK to develop an appropriate personal development plan and a full induction programme given. The charity should also organise appropriate accommodation, transfers between the airport and the hospital and be a source of advice and support.

The valuable contribution the trainee makes should be recognised in the provision of expenses by the charity, which will also aid recruitment. The cost of flights, transfers and food / accommodation will cost in the region of £1500 - £2000. This represents tremendous value for money and will be likely more than repaid over the long term in the form of advocacy and fundraising. High quality candidate will raise the profile and visible contribution of the charity, in addition to creating more tangible links between the South West and Masanga. An additional benefit would be supervision of PMS undergraduate students, who currently require a significant amount of the local doctors time.

**Masanga Fellowship**

For many doctors in training it may not be possible to spend such a significant period of time abroad. A period of time of approximately 4 weeks might be taken from most training programmes in the form of 2 weeks of annual leave and 2 weeks of study leave. Such a programme is likely to be popular and would have a far greater pool of potential recruits.

There is a question of how to make such a short period of time useful for the hospital. Entry should also be competitive and should favour previous developing country experience and consider not only the skills that they can bring to the hospital, but whether they will be able to apply these skills to such a setting. Ensuring that those who travelled to Masanga had realistic expectations and understood the many challenges that they may face would be important.

The trainee should have a well-defined role with specific outcomes and goals. Any project should be approved in advanced by local clinical staff. Educational interventions for nursing aids, CHOs and the local doctors would be particularly useful. This would be in addition to providing clinical support on the wards.

There are some speciality specific skills that would be particularly useful at Masanga. For example Paediatric and Obstetric problems represent the majority of the clinical caseload. The doctors have a good level of surgical training but specialist surgeons, particularly in Plastics, would be welcomed by the local staff. Other specialities could be included at a later date, depending on the initial success of

the project. Including nurses and other hospital professionals, such as radiographers and lab staff could be useful for the hospital.

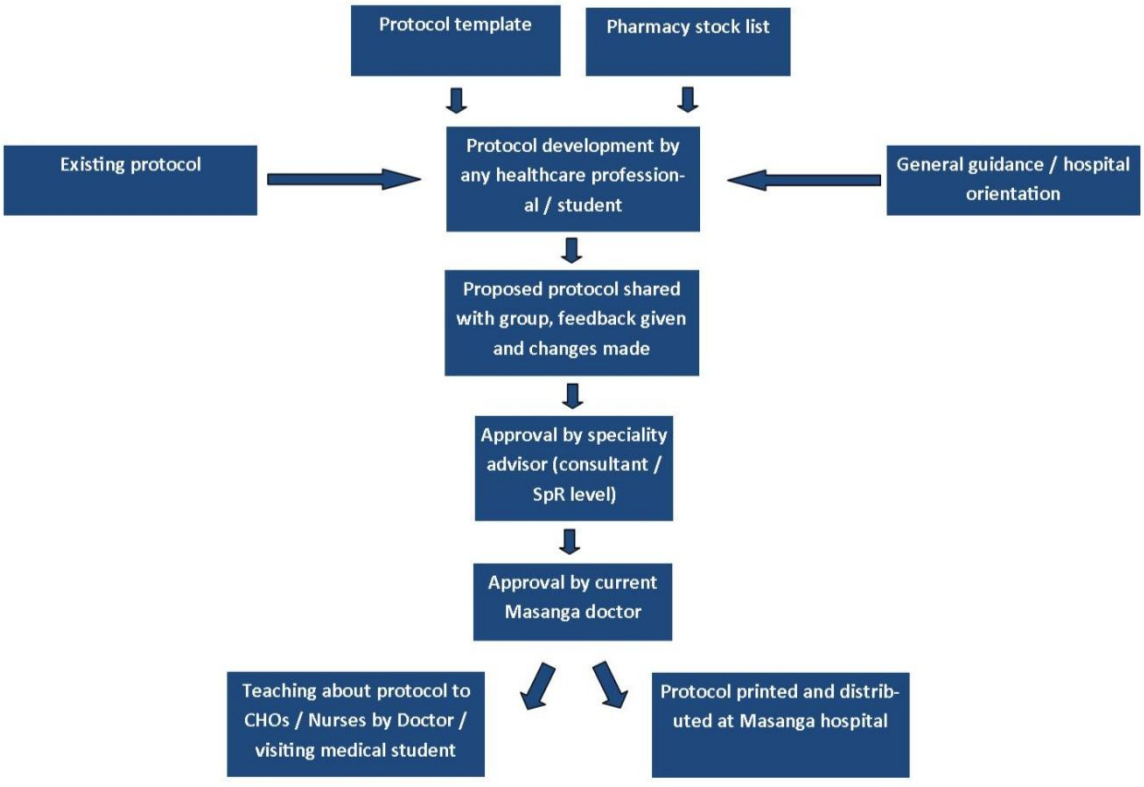
In order to attract the best quality applicants the programme needs to be well defined and should have prospective approval as a valid use of study leave from the appropriate specialist school at the deanery. In order to incentivise and bring a level of prestige and value to the programme, the charity should consider providing a small package to the participant, such as provision of airport transfers and food / accommodation. Flights would be paid for by the participant. The cost to the charity should be less than £150 for each participant and in the long term will probably be more than repaid in the form of advocacy and fundraising.

**Protocol development**

Protocols exist for the outpatient treatment of common presentations. There are also extensive protocols for inpatient paediatrics and some for obstetrics. These have been written by doctors who have worked at Masanga for many years and are a useful tool for the CHOs.

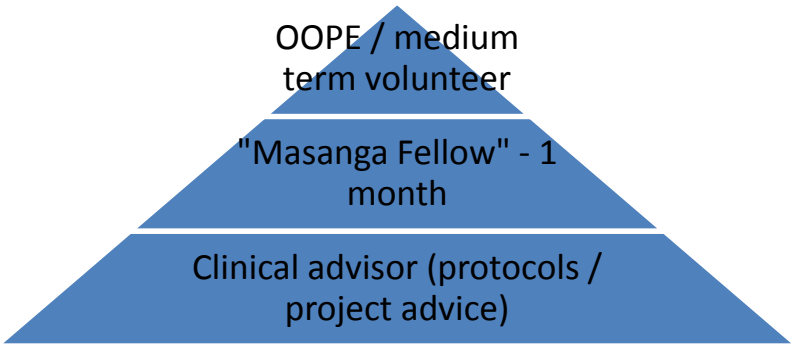
The existing doctors and pharmacy staff are keen to update these protocols and for them to be reviewed by specialists. However, it is important that they remain relevant to a low resource environment and use the equipment, medication and staff that are available at the hospital.

A proposed system is using an internet "dropbox" to promote the development of new protocols and review of existing protocols. This would encourage sharing of expertise whilst retaining local knowledge. It could encourage engagement by Peninsula clinicians who may not be in a position to travel to Sierra Leone but are keen to contribute.



**Key recommendations**

- Opportunities available to Peninsula deanery doctors should be made clear, with well defined “packages” advertised and recruited for.
- A small contribution towards volunteers costs would not only increase the number of applicants but perhaps more importantly would increase the perceived value of the programme to applicants and emphasise the work that they need to return to the project.
- An induction programme should be developed for all volunteers traveling to Masanga to reduce the acclimatisation period and therefore increase the contribution made by short term volunteers



**Acknowledgement**

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## Appendix A: New admission form

MASANGA HOSPITAL

**Triage nurse to complete**

Patients name: _____

Address: _____

Age: _____ years _____ months

Sex: M / F

Weight: _____ kg

Registration book number: _____

Bed number _____ Ward _____

Time and Date of admission: _____ : _____ ____/____/____

Route of admission: OPD / direct to ward / ED

Initial observations:

T _____ °C P _____ bpm BP= _____/_____ O2 Sats _____ % RR _____

Triage nurse: _____

Triage category: **Immediate / urgent / routine**

**CHO / Doctor to complete**

Admitting CHO / Doctor: _____

**Reason for admission**: _____

**History**: _____

_____

_____

**Examination**:

Looks: Well / OK / Unwell

A V P U

**Investigations**:

| | Requested? | Result? |
|---|---|---|
| MPS | | |
| Hb | | |
| Stool | | |
| | | |

**Diagnosis**: 1. _____

2. _____

3. _____

**Treatment**: _____

_____

_____

_____

_____

Monitoring: _____

**To complete on discharge**

Time and date of discharge _____ : _____ ____/____/____

Outcome: Home / Transferred / Absconded / Home Palliative / Dead

Final diagnosis: _____

**Appendix B: Equipment**

| Item | Available from | Recommended source |
|---|---|---|
| **IV** | | |
| Cannulas | Big store | |
| Needles | Big store | |
| Giving set | Big store | |
| Syringes | Big store | |
| N Saline ampules | Big store | |
| Water for injection ampules | Big store | |
| Tourniquets | Put in x-ray dep. | |
| Bandages | Big store | |
| Cannula dressings | Big store | |
| Tape | Big store | |
| Gauze | Big store | |
| Sterets | Big store | |
| Scalpel | Big store | |
| Assorted sutures | Big store | |
| Cotton wool | Big store | |
| | | |
| **Airway** | | |
| Oropharangeal airway | Put in x-ray dep. | |
| Nasopharangeal airway | Put in x-ray dep. | |
| Bag mask | Put in x-ray dep. | |
| O2 masks | Put in x-ray dep. | |
| Nasal speculum | Put in x-ray dep. | |
| Suction catheters / tubing | Put in x-ray dep. | |
| | | |
| **Orthopaedic** | | |
| C-spine collar | Put in x-ray dep. | |
| Thomas splint | Put in x-ray dep. | |
| Plaster of Paris | Big store | |
| | | |
| **Surgical** | | |
| NG tubes | Big store | |
| Urinary catheter | Put in x-ray dep. | |
| Surgical sets | Theatre | |
| Scalpel blades | Big store | |
| Suture cutting blade | Put in x-ray dep. | |
| Sterile gloves | Big store | |
| Assorted sutures | Big store | |
| Chest drain | Put in x-ray dep. | |
| Catheter bags | Put in x-ray dep. | |
| Urometers | Big store | |
| KY jelly | Big store | |
| Kidney dishes (metal) | required | IDA / UK |
| | | |
| **Obs / Gyn** | | |
| Vaginal speculum | Put in x-ray dep. | |
| Pinard stethoscope | required | Donated / bought in UK |

| | | |
|---|---|---|
| | | could be brought by volunteers |
| Doppler | UK – could be brought by volunteers | Donated / bought in UK<br>could be brought by volunteers |
| | | |
| **Diagnostics** | | |
| Urine testing strips | From lab<br>More required | Donated / bought in UK<br>could be brought by volunteers |
| Paracheck strips | From lab | |
| | | |
| **Portable electrical equipment:** | | |
| USS machine | Provided | |
| 2 x monitors (BP machine, ECG, Pulse oximeter) + electrodes (rechargeable battery powered) | required | Donated / bought in UK<br>could be brought by volunteers |
| 2 x oxygen concentrators (rechargeable battery powered) | required | Donated / bought in UK<br>could be brought by volunteers |
| O2 sats monitor (rechargeable battery powered) | 1 x provided by Capacare | Donated / bought in UK<br>could be brought by volunteers |
| 3 x Blood glucose machine | Required | Donated / bought in UK<br>could be brought by volunteers |
| Testing strips for blood glucose machine | Required | Donated / bought in UK<br>could be brought by volunteers |
| Nebuliser (rechargeable battery powered) | Required | Donated / bought in UK<br>could be brought by volunteers |
| 3 x Thermometer | 1 x Put in x-ray dep.<br>2 x more required | Donated / bought in UK<br>could be brought by volunteers |
| Suction machine (rechargeable battery / foot powered) | 1 x hand powered put in x-ray dep.<br>1 x more required | Donated / bought in UK<br>could be brought by volunteers |
| | | |
| **Dressings** | | |
| Scissors | Required | Donated / bought in UK<br>could be brought by volunteers |
| Forceps | Theatres / Big store | |
| Gelonet dressings | Big store | |
| Bandages | Big store | |
| Mepore | Big store | |
| Nasal tampons | Put in x-ray dep. | |
| Gauze | Big store | |
| | | |
| **Miscellaneous:** | | |
| Patient transfer slide | Required | IDA |
| Stethoscopes | Required | Donated / bought in UK<br>could be brought by volunteers |
| Reflex hammer | Required | Donated / bought in UK<br>could be brought by volunteers |
| Electrodes for monitor | Put in x-ray dep.<br>(“poper” style) | |
| Weight scales | Required | Donated / bought in UK |

| | | |
|---|---|---|
| | | could be brought by volunteers |
| Blood pressure machine (non powered) | Required | Donated / bought in UK<br>could be brought by volunteers |
| Gloves | Big store | |
| Soap dispenser | Put in x-ray dep. | |
| Laptop computer with lock | Required | Donated / bought in UK<br>could be brought by volunteers |
| Mobile telephone | Required | Donated / bought in UK<br>could be brought by volunteers |
| Oxford handbook clinical medicine / BNF / other books | Required | Donated / bought in UK<br>could be brought by volunteers |
| Protocol book | Required | bought in UK<br>could be brought by volunteers |
| | | |
| **Furniture** | | |
| 8 x hospital beds | Provided | |
| 8 x hospital mattresses | Put in x-ray dep. | |
| 8 x mosquito nets | Locally | Makini |
| 2 x examination couches | Provided | |
| 1 x nurses desk | | Masanga carpentry |
| 2 x kitchen type units | | Masanga carpentry |
| 6 x bedside tables | | Masanga carpentry |
| 6 x benches | | Masanga carpentry |
| 6 x chairs | | Masanga carpentry |
| | | |
| **Domestic** | | |
| 24 x Sheets | Arriving in next container from Denmark | |
| 24 x Blankets | Locally | Makini |
| 10 x pillows | Locally | Makini |
| 24 x pillow cases | Put in x-ray dep. | |
| Paper sheets for examination couches | Put in x-ray dep. | |
| 10 x water buckets (“rubbers”) | Locally | Makini |
| Cleaning equipment | Locally | Makini |
| | | |
| **Stationary** | | |
| Clipboards | Locally | Makini |
| Filing system | Locally | Makini / Masanga capentry |
| | | |