

# EMERGENCY ADMISSIONS UNIT

## MASANGA HOSPITAL

### Start Up Phase Report

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## **Introduction**

Masanga hospital is a former leprosy hospital located in Tonkolili district, Sierra Leone. It has approximately 100 beds split between surgical, paediatric and maternity wards. There is also a busy outpatient department. It had been observed that the hospital could benefit from developing an area to receive acutely unwell patients, and also the facility to provide more high dependency care for patients who require it. The Emergency Admissions Unit (EAU) is a project supported by the charity Masanga UK and Peninsula College of Medicine and Dentistry to provide such facilities to the hospital.

Dr Doug Watts travelled to Masanga for a period of approximately 7 weeks in January 2012 and looked at the logistics, costs and clinical implementation of such a unit. I travelled to Masanga in September 2012 once the unit had been built for a period of approximately 4 months. I continued on from Doug's work and focused on getting the unit functioning and accepting patients.

A good explanation of the clinical systems within the hospital prior to the opening of the EAU is available in Doug's report and I have not repeated these in detail here.



## **Project Objectives**

- To project manage the opening of the Emergency Admissions Unit, including:
  - Ensuring the building is adequate for needs

## Emergency Admissions Unit

- Staffing – putting both the correct nursing staffing in place and identifying a local community health officer (CHO) to work in the department
- Reviewing the equipment required to run the ward and ensuring it is in place
- Communicating the role of the new unit and how it could work in the context of the current hospital systems
- To map out how patient flow through the hospital would change with inclusion of the EAU
- To identify opportunities for audit, particularly in monitoring whether the new unit has improved patient outcomes
- To be generally involved in the clinical work of the hospital, particularly in seeing and treating patients presenting to the EAU

My work in Masanga also formed part of my Masters studies in Remote Healthcare with Peninsula College of Medicine and Dentistry Graduate School.

**Building**

The EAU building is the first building you see as you enter the Masanga Hospital grounds. There are two entrances, the pedestrian entrance off the main road has a sign above it identifying the building as “The Grace Emergency Unit”. The East entrance is hoped to become an ambulance entrance in the future.

Inside the building there is a resuscitation room containing 2 beds and space for an ambulance trolley. The oxygen concentrator, ECG monitor and two vital signs monitors are kept in this room. There is also a trolley cabinet containing basic emergency clinical equipment.

The high dependency ward area contains 8 beds. The original plans were to have 6 beds in this area but in practice there has been plenty of room for 8. The nursing staff are able to cope well with this number of patients. There is a nursing station between the resus room and the ward, half height walls and internal windows allow the nursing staff to be able to view all of the patients from here. The space adjacent to the nursing station is not currently being utilised. There are suggestions to set it up with an examination couch to allow the CHO to clerk patients here or possibly to move the plaster of paris from theatres and to use this area for plastering.



The resuscitation room

The following diagram gives basic information on the layout of the building.



## Electrical supply

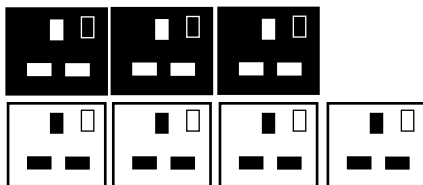
### Generators

The electricity supply to Masanga Hospital comes entirely from fuel run generators. There is a main generator which, when turned on, provides enough power to supply the whole compound. This

generator is routinely ran between 7 and 10pm each evening and also when the operating theatre is in use. The main generator uses a significant amount of fuel and is regarded as expensive to run. This meant that previously it could be difficult to justify leaving it on all night, for example, to power an oxygen concentrator to provide oxygen for a single patient. For the EAU a smaller generator has been acquired. This uses significantly less fuel than the main generator and can be ran 24 hours a day if necessary to provide power for the unit. It provides enough power to run basic equipment such as the oxygen concentrator and monitors but is not powerful enough to be used with heavy equipment such as the ultrasund scanning machine.

### Power points

There are several power points in the department, each point is only connected to either the main or the small generator. Red dots on the diagram above indicate single electricity points connected to the main generator. The two green dots represent clusters of 7 power points of which 3 are connected to the small generator and 4 to the main generator. Small generator power points in the building have been painted black, this is to clearly distinguish them to try and prevent heavy machines being plugged into them in error and damaging the generator.



An example of one of the two clusters of power points in the resus room

Power points for the small generator are only located in the resus room so if a patient requires oxygen or monitoring out of hours they must be nursed in there.

### Lighting solution

One way by which the EAU can raise the level of care able to be provided by the hospital is by providing an area where electrical light is available 24 hours a day. In the other wards lighting is only available if the main generator is on and trying to treat acutely unwell patients by torch light has been a source of difficulty. To prevent the need to have the small generator on every night a battery pack solution has been put in place. A system of 6 connected car batteries on a trolley is charged each day during the hours of 7 and 10pm (when the main generator is on). At 10pm the EAU lighting circuit can then be plugged into this battery pack. The system, when tested, was able to provide continuous light for over 24 hours. It is noted that the life of these batteries will fade over time but they should be able to power lighting in the hours of darkness for the foreseeable future.





## Equipment

The equipment that we prepared and that was available in the department when we opened is listed in appendix 1. All of the basic clinical equipment that we required was available.

There are some other items which were available, but were not yet placed in the ward. These are generally items related to slightly more complicated procedures, e.g. chest drain insertion, that up until now have been undertaken in either the operating theatre, wound dressing room or the labour room. We wanted to see how the EAU was functioning before we encouraged undertaking of these clinical tasks there. These items include:

Surgical	Obs and Gynae
<ul style="list-style-type: none"> <li>• Scalpel blades</li> <li>• Assorted sutures</li> <li>• Sterile gloves</li> <li>• Small assortment of dressings</li> <li>• Surgical sets</li> <li>• Chest drain</li> <li>• Plaster of Paris</li> </ul>	<ul style="list-style-type: none"> <li>• Vaginal speculum</li> <li>• Pinard stethoscope</li> </ul>

There are some items, which are available locally, and are for consideration of future purchase for the unit. These are as follows:

Item	Source
Weigh scale	Makeni
More bedsheets	Tailor
Bedside Cabinets	Carpenter

There are a few items of equipment that could be beneficial to the unit which are not available locally but could be brought from the UK. These are:

- Tendon hammers
- Patient transfer slide
- Nasopharyngeal airways
- Books –such as Oxford Handbook of Clinical Medicine, Oxford Handbook of Emergency Medicine, BNF
- Near patient blood glucose testing machine
- Testing strips for blood glucose machine

The “ABC” equipment cabinet in resus



## Emergency Admissions Unit

- Laptop computer with lock
- An ultrasound machine. One which was already available in the hospital was identified for the unit but it was found to be faulty and is now awaiting repair, if unrepairable a replacement could be beneficial

### Medication stocks

A list of essential medications and fluids that are to be kept in stock in the EAU for use when the pharmacy is closed was created and is attached as appendix 2. These medications are kept in a cabinet with multiple lockable drawers as shown. A “pharmacy” folder is available in the EAU which allows nurse aids to keep track of when they use the ward stocks.



The medication cabinet

**Staffing**

**Community Health Officers (CHOs)**

A CHO, Almamy Bangura, has been appointed to work in the unit. His working hours are 8.15 - 4.30 pm Monday to Friday and he is also involved in the on call rota. However, after a few weeks of the EAU being open, we decided to alter this and start a rotational system with the CHOs who were working in the outpatient department (OPD) - David Kine and Mohammed Kamara. The OPD was functioning very closely with the EAU in that most of the patients were referred from there. We thought it would be beneficial for all three of the CHOs to work in both the OPD and the EAU. They are all recent CHO graduates (within the last three years) and by rotating they will gain greater experience. By working in both areas, they will also understand better how each area is operating and be able to better coordinate referrals and patient flow. As I left Masanga we were running a once weekly rotation as follows:

<b>Week beginning</b>	<b>7 January</b>	<b>14 January</b>	<b>21 January</b>
<b>EAU</b>	Mohammed Kamara	David Kine	Almamy Bangura
<b>OPD</b>	David Kine Almamy Bangura	Almamy Bangura Mohammed Kamara	Mohammed Kamara David Kine

**Fully Qualified Nurse (SECHN or State Registered Nurse)**

No appropriate fully qualified nurse has been identified to work in the unit. The hospital only has 3 SECHNs at present who oversee the nursing aid team and provide clinical care as part of the on call rota. The government did identify a number of state registered nurses to join the hospital but they have not yet started work. There has been some difficulties such as in arranging acceptable accommodation for them. There is also sometimes reluctance from them to leave the more populated areas where they may prefer to live and can earn more money by having multiple jobs. It would be very advantageous for the unit to have a fully qualified nurse.



One of the nursing students

**Nurse Aids**

8 nurse aids are employed to work in the unit. 4 of these are nurse aids who have previous experience working on other wards and 4 of them are from the recent October 2012 graduates.

<b>Experienced nursing aids</b>	<b>Newly graduated nursing aids</b>
Joseph Koroma	Edward Fofonah
Aminata Bangura	Aruna Kargbo
Lovetta Juana	Zainab Turay
Cinderella Koroma	Ramatu Koroma

The nurse aids with previous experience come 2 from surgical, 1 from maternity and 1 from paediatric ward. The rota is created so that there are 2 nurses on shift at all times.

Joseph Koroma was picked as a lead for the nursing aids and takes on extra responsibilities such as writing their rota and ordering ward equipment stocks.

A training programme was run for the nursing aids to introduce them to emergency and high dependency care. The timetable for this is attached in appendix 3.



The nurses station

**Cleaner**

A cleaner Osman Kargbo has been hired and is working every week day in the unit.

**Out of hours**

Out of hours cover for the unit is provided by the same rota which covers the rest of the wards. It consists of at least one junior surgical training programme (STP) student/CHO/SECHN as first on call and a senior STP student and Dutch Tropical Doctor as the second on call.

## Documentation

### Admissions Book

Every patient who is seen on the ward is entered into the admissions book by the nursing aids. Their demographic details are recorded along with clinical details such as provisional diagnosis, final diagnosis and outcome. It allows us to keep track of how many patients we are seeing on the unit, the frequency of different conditions and may prove useful for audit. Unfortunately sometimes the clinical data in the book is entered incorrectly, particularly in terms of final diagnosis. I have made attempts to direct the nurse aids in how to improve the accuracy of this data collection but I only had time to do this informally, there remains possibility for further improvement. I have an electronic copy of the admissions book from the opening date up until the time of my departure which I can provide, I have not added it to this report for confidentiality reasons.

### Acute Admissions Form

Dr Doug created a new acute admissions form for use in the EAU. It works well clinically and has been designed with audit in mind – containing a space to input the patient outcome on discharge. In practice I found that completion of this was often forgotten. This is something I tried to improve with regular reminders to clinical staff, however again there is room for improvement. A copy of the acute admissions form is included in appendix 4.

### Admission to HDU Form

A form was designed for patients who are admitted to the HDU. We do not want to duplicate paperwork and in practice it is not always necessary to complete this form – particularly if patients had already had an acute admissions form completed. However, it did prove particularly useful for post op patients and promoted the nursing staff towards things like the frequency of observations and IV fluid requirements. This form is shown in appendix 5.

### Existing Hospital Paperwork

Much of the existing hospital paperwork will also be made use of in the unit. This allows better consistency when patients are then transferred to the other wards. The forms that we use are:

- Medication chart
- Continuation sheet
- Fluid balance chart
- Vital signs chart
- Discharge form
- Lab request form
- X ray request form

**Filing**

The current filing system consists of a cardboard box on the EAU into which we put the notes of all patients discharged directly from the unit. The majority of patients however are transferred to other wards and their notes go with them. The other wards operate a very basic filing system in which notes are sent to the registry office, and put in a cardboard box there, when patients are discharged. The fact that many patients have the same first and surnames and they often cannot tell you their age or date of birth makes it difficult to link old notes to repeat admissions.

Particularly if good quality audit is to be undertaken this system needs to be improved. It would require significant time and hospital wide re-education of the nursing aids to a new system.



The corridor in the EAU with benches for patients to wait on

## Protocols

Many of the clinical staff, in particular the CHOs and SECHN, who are actively seeing patients and covering on calls have a relatively short education and sometimes little experience. To support this the hospital uses quite a lot of protocols. It was suggested that the EAU should have its own set of protocols for both adult and paediatric admissions. These should reflect the resources available and the capabilities of the hospital.

I started to prepare provisional copies of these during my time in Masanga. It is a large piece of work that should be completed to a high standard and in line with evidence and international guidelines for low resource settings. We would be keen that once written these are reviewed by appropriate senior clinical staff in the UK. I had intended to periodically email back the work that I had done, but lack of access to the internet and slow connections prevented this. A list of the protocols I have written is as below and the documents are available in appendix 6. I hope they can be reviewed as stated and then formally implemented. Due to the time this process takes – once agreed by myself and Dr Josien – we made provisional copies available in the ward. This also allows us to see how they are being used and if the format can be improved.



The east side of the unit and possibly the ambulance entrance in the future

**Provisional adult protocols that have been written**

- **Triage Protocol**
- **Resus Protocols** - all completed as all triage category priority 1 protocols. Staff were instructed to work down them in ABCDE order picking the first most appropriate protocol.

**A - Airway**

**A1** - Non patent airway protocol – airway obstruction, choking, dental abscess

**B - Breathing**

**B1** - Asthma

**B2** - Severe Pneumonia

**B3** - Tension Pneumothorax

**C - Circulation**

**C1** - Shock

**C2** - Anaphylaxis

**C3** - Heart failure

**C4** - Malignant hypertension

**D - Disability**

**D1** - Unconscious patient

**D2** - Convulsions

**E - Environment**

**E1** - Fever

**Suggestions for Further Protocols**

There are many more topics that could be covered by protocols, a list of these as discussed by Dr Josien and myself is as follows:

**Adult**

- Disability
  - CVA
  - Acute confusional state
  - Spinal cord injury
- Environment
  - Drowning/hypothermia
- ATLS
  - RTA/trauma protocol
  - Machete injury
  - Fall from a height
- Misc
  - Jaundice



Pregnant patient

**Paediatric**

- Airway  
Non patent airway protocol – inspiratory stridor, choking
- Breathing  
Asthma  
Severe Pneumonia
- Circulation  
Severe diarrhoea and vomiting  
Shock
- Disability  
Convulsions  
Unconscious patient
- Environment  
Fever  
Drowning/hypothermia

**Start Up Phase**

**Doctors of the World Plastic and Reconstructive Surgery Mission**

Between Sunday 28<sup>th</sup> October and Wednesday 7<sup>th</sup> November 2012 a Doctors of the World team from Holland came to Masanga Hospital and ran a Plastic and Reconstructive Surgery Mission. At this time the EAU building was completed but had not yet opened to patients. Therefore it was decided that it could be used to house both pre and post op patients from the mission. The 8 nurse aids hired to work in the EAU provided the nursing care. The type of patients treated was quite consistent and it gave us a chance to slowly get the ward up and running and ensure the building was working and contained all the basic clinical equipment we needed.



Preparing for the Doctors of the World Mission

**Opening of the Emergency Admissions Unit**

The Emergency Admissions Unit was open to receive its first emergency patients on Monday the 3<sup>rd</sup> of December. This gave us just over 3 weeks after the Doctors of the World had left to make the final arrangements in terms of preparing the unit and getting all the necessary equipment prior to opening. Staff were informed of plans to open the unit at a nurses meeting on Monday 26<sup>th</sup>

## Emergency Admissions Unit

November. We also held a separate meeting with the OPD staff on Tuesday 27<sup>th</sup> November to inform them about how the EAU and OPD would function together and to familiarise them with the triage protocols.

It was decided initially to only accept a specified group of patients to the unit – all acutely unwell adults needing admission to the hospital (excluding maternity cases) were accepted. These could be referrals from the OPD during normal working hours. A triage protocol was written (see appendix 6) to guide OPD staff as to who to send to the unit. Patients could also present directly to the unit if it was out of hours or if they were clearly requiring immediate life saving care.

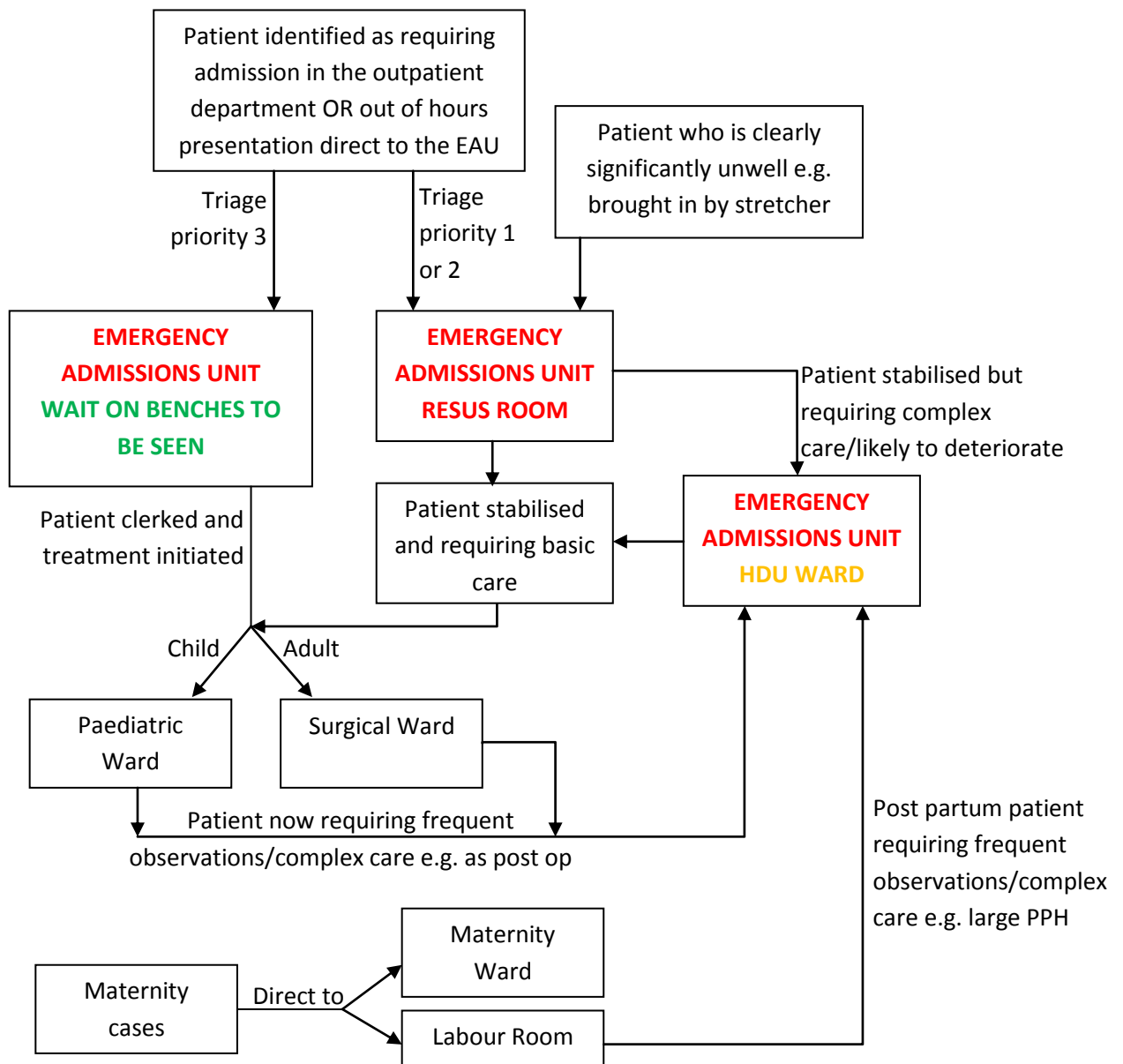
Paediatric cases were not accepted initially but instead were to go directly to the paediatric ward as had been the previous system. The start up phase information as given to the hospital staff is included in appendix 7. After the unit being open for 2 weeks it was seen to be running well and we then also started to accept paediatric patients.



The HDU ward once fully open

**Patient Flow**

In the previous clinical system patients would have been admitted to either the surgical, maternity or paediatric wards and they would have stayed in the same place until discharge. However with the EAU accepting all new admissions initially there is more movement of patients. The cooperation between the different wards has been good and the patient flow has generally worked well. On occasion, particularly the surgical ward, has been full and this has led to a back up of patients in the EAU. In one instance we had 2 extra mattresses on the floor of the resus room which compromised the emergency care we could provide. We always attempt to keep at least one resus bed and one HDU bed free and at most other times this has been possible. Patient flow through the hospital is summarised in the diagram below.



## **Audit/Data Collection**

There has been no audit undertaken yet regarding the Emergency Admissions Unit. There are many opportunities for audit in the department. In particular it would be nice to see if the opening of the unit and being able to provide a higher level of care has improved patient outcomes.

Currently data on patient outcomes is recorded in 3 places:

- EAU Admissions Book/Admissions books on other wards  
Data for all patients presenting to the unit along with details of diagnosis and outcome is recorded in an admissions book. Unfortunately, as previously noted, the data recorded is not always of high quality, also when patients are transferred to other wards the data on their ultimate outcome is often not available in the unit and is not recorded in our book. Other wards also keep their own admissions books of the same format so some data might be available here. However with many patients having the same name and no other reliable patient identifier linking information would be difficult.
- Acute Admissions Form  
The acute admissions form has a section to record the patient outcome when they leave the unit. All the clinical staff routinely require reminding to fill this in.
- Discharge forms  
The most accurate information is recorded on the discharge forms that are given to patients, as these are filled in by only the CHOs, STP students and doctors. At present only one copy of these is made and it goes with the patient. It might be worth looking at making a change to this system, e.g. to keep another copy of the form in the hospital, to increase the quality of audit that can be performed.

With the data we collect it would be fairly straightforward to undertake an audit comparing the overall hospital mortality rates from a period last year when the EAU was not open and the same period now it is open. I feel this would be worth doing but we would have to bear in mind a number of conflicting factors. For example the government hospital in Magburaka has recently reopened. When it was closed patients may have been travelling longer distances to reach Masanga, and therefore presenting later, in a more advanced condition. This feasibly could lead to a higher mortality rate during that period.

Other suggestions for audit could be more specific, for example looking at whether mortality rates for children under 5 with pneumonia have improved with the new ability for 24 hour a day oxygen.

It remains important that audit is performed in the new unit. It is not something that will be initiated internally – the local staff are not familiar with audit and the Dutch doctors are already very busy collecting data for the hospital as a whole. I hope the next Masanga UK doctor will be able to take up the challenge!

## Opening Ceremony

The opening ceremony took place on Monday January 14<sup>th</sup>.

### Attendees

The event was attended by a number of notable people. The Sierra Leone Ministry of Health was represented by Dr. Bash-Taqi, the Director for Postgraduate Training, and Dr Joseph, the Education Director. Important local stakeholders such as the Paramount Chief, the Council Chairman, the District Medical Superintendent, the Honourable Minister for Tonkolili and the Local Unit (Police) Commander were also in attendance.

We were pleased also that 3 representatives from Dawnus – Richard Davies, Roy Duffy and Mark (Supervisor in Masanga) also came. They kindly expressed their enjoyment in being part of the Masanga project and an interest in continued future involvement.

A large Norwegian delegation, in association with Capacare and led by Håkon Bolkan, was also visiting Masanga and included the Opening Ceremony in their programme of activities.

The event was covered by a TV crew from Freetown who filmed the proceedings for local television.



Speeches during the Opening Ceremony

### **The programme**

The programme started at 4pm and was held in a specially erected shelter next to the entrance of the Emergency Admissions Unit. A number of speeches were given by the important persons present. I also spoke on behalf of Masanga UK and expressed our thanks to everyone who has been involved with the project.

This was followed by an official “cutting of the tape” by the Honourable Minister for Tonokolili and a tour through the department for attendees. We then held a celebration dinner for all invitees.

## **Evaluation of the EAU**

### **Advantages of the EAU**

I spent 6 weeks in Masanga with the EAU being open. The hospital staff very quickly accepted the unit and got used to the new system. We have seen over 150 cases in this period including a wide variety of conditions from severe malaria to road traffic accidents to snake bite.

The increased nursing to patient ratio has improved care greatly from what has been available previously. Patients can receive frequent IV medications, can have observations even up to every 15 minutes and have accurate fluid balance recorded – none of these things were happening reliably on the other wards.

The ability to have light 24 hours a day is a great help in trying to assess and treat patients in the evening/night time hours. Also having the small generator and having the option to keep a patient on oxygen continuously (instead of having to stop it at 10pm as was often the case with the main generator) is a real advantage. In particular I have treated a number of paediatric patients with severe pneumonia who I have no doubt would not have survived without this facility. The access to the vital signs monitors, which we previously only had in the operating theatres, makes monitoring these and other acutely unwell patients much more effective.

Having a small, but very motivated, nursing aid team is also of benefit. On the other wards it was possible that something even as basic as IV fluids might not be available out of hours. On the EAU a regularly monitored supply of emergency medications, IV fluids and basic clinical equipment like giving sets and cannulas has become possible. The nursing aid team are also skilled and can routinely recognise a deteriorating patient and perform a range of clinical skills such as paediatric cannulation and male catheter insertion.

Overall the EAU is a real asset to the hospital and is appreciated by both the staff and patients.

### **Areas for further development**

There are some areas which I identified during my time in Masanga where, in my opinion, further work/changes could be applied to improve the current functioning of the EAU within the context of the hospital's clinical systems.

- **Triage**  
Most of the patients coming to the EAU are referred from the outpatient department. As of the last few weeks the previous triage nurse has left and there is no replacement currently employed. Unwell patients have to wait to be seen by a CHO and when they are seen they often do not receive a set of vital signs. An effective triage nurse could be of great benefit to the OPD – providing the CHOs with a set of vital signs for the more unwell patients they see



and guiding them who needs seen most urgently - they could also identify the most unwell patients and send them directly to the EAU.

- **Communication during on calls**  
There is very limited mobile phone signal throughout the hospital complex and Masanga village. When an acutely unwell patient arrives in the night often one of the two nursing aids either has to go themselves or find someone who can go to fetch the first on call for assistance. This can take some time and may leave only one nurse on the ward. The process is repeated when further personal, e.g. the laboratory technician or second on call, are required. An improved communication system, such as a long range radio system, for the on call staff could be of benefit.
- **Use of the area adjacent to the nurses' station**  
There is an area adjacent to the nursing station which is not currently being used for any purpose. It is suggested the plaster of paris could be moved to this area from theatres. It could also be beneficial to make a curtained area. There are no curtains around the beds and there is currently there is nowhere to perform private examinations/procedures on the ward – we are either using fairly ineffective screens or taking patients down to the labour room. A final suggestion is that an examination couch could be placed here and it could be used by the clinical staff for clerking of patients not requiring immediate resuscitation.
- **Data collection/filing system**  
As mentioned previously in the section on audit, there is no one current reliable system for tracking patient outcomes. There is also no effective filing system for the notes of patients who are discharged. When patients are transferred to other wards their notes go with them and get lost in the equally poor filing systems of those wards. This compromises our ability to perform good quality audit and could be improved.
- **CPAP**  
The oxygen concentrator that was sent for use in the EAU came with a paediatric CPAP facility. This has not yet been effectively set up and used. It is hoped that when someone with appropriate expertise, such as an anaesthetist, is in Masanga that we can be guided in the use of this.

## Acknowledgments

Many thanks to Dr Josien, Dr Alex, Dr Mark, Dr Jet, Bart, Anne-Marie, Patrice, Emma all of the CHOs, nurse aids, the Danish volunteers and all the other staff at Masanga for their help and support with the opening of the Emergency Admissions Unit and for making my stay in Masanga so enjoyable. Also thanks to Oz and the Masanga UK team for enabling me to be part of this project and spend time in Masanga.



**Appendix 1: Equipment available in the EAU at the time of opening**

<b>Consumables</b>	
<b>Item</b>	<b>No. in Department</b>
<b>Airway/Breathing</b>	
Oropharangeal airway	11 orange, 10 blue
O2 masks	10 Hudson masks, multiple "system 22" masks
Nasal speculum	6
Suction catheters / tubing	4 sets of tubing, 4 "suckers"
<b>Circulation</b>	
Cannulas	10 white, 24 green, 10 pink, 10 yellow
Needles	50 green, 50 blue
Giving set	20
Syringes	64 2ml, 50 5ml, 77 10 ml, 12 30ml
N Saline ampules	20 5ml, 20 10ml
Water for injection ampules	20
Bandages	Big 23, small 32
Cannula plaster	2 rolls
Tape	1 roll
Razors	3 boxes
Cotton wool	3 rolls
Electrodes for ECG machine	3 packs
Ringers lactate	5 500ml, 10 1 litre
Normal Saline	5 500ml, 10 1 litre
5% Dextrose	5 500ml, 10 1 litre
<b>Surgical</b>	
NG tubes	10, also many small suction catheters that can be used as NG
Urinary catheter	10 of Size 14, 10 of size 16
Catheter bags	9
Urometers	1
<b>Dressings</b>	
Triangular bandage	3
Gauze	1 pack
Iodine	6 bottles
Gloves	Yes – sizes M and L
Alcohol Disinfectant	4 bottles
<b>Domestic</b>	
Cleaning equipment	Disinfectant, soap, broom...
<b>Permanent Equipment</b>	
<b>Item</b>	<b>No. in Department</b>
<b>Airway/Breathing</b>	

## Emergency Admissions Unit

Bag valve mask	1 with adult size mask, 2 with small adult size mask and 1 with small child size mask
<b>Orthopaedic</b>	
C-spine collar	2 tall size, 1 regular size, 1 small size, 2 soft collars
Set of inflatable splints	1
<b>Obs / Gyn</b>	
Doppler	1
<b>Miscellaneous Clinical</b>	
Stethoscopes	2
Blood pressure cuff (non powered)	2
File with photocopied sections from emergency medicine/nursing books	1
Protocol file	1
<b>Portable electrical equipment:</b>	
Monitors (BP machine, Pulse oximeter)	2
3 lead ECG monitor	1
Oxygen concentrators	1
Portable O2 sats monitor (rechargeable battery powered)	2
2 x Thermometer	2
Suction machine (hand powered)	1
X Ray machine (Philips Practix 33 Plus)	1 – in XR dept
Battery pack (to provide 24 hour lighting)	1
<b>Nursing</b>	
Safety Box/sharps bin	3
Scissors	1
Forceps	4
Kidney dishes (cardboard)	11
Kidney dishes (metal)	2
Large buckets “rubbers”	3
Bedpans	4
Medium buckets	2
Small buckets (with lid)	1
Cups	3
Rubber for collecting alcohol disinfectant	2
<b>Administration</b>	

## Emergency Admissions Unit

Nursing report book	1
Record of admissions book	1
Pharmacy folder	1
Clipboards	8
Acute Admission forms	Multiple
HDU Admission forms	Multiple
Vital signs forms	Multiple
Fluid Charts	Multiple
Lab forms	Multiple
Discharge forms	Multiple
Stapler	1
Padlocks	4
<b>Furniture</b>	
Hospital beds	9
Hospital mattresses	9
Bed sheets	8
Pillows	10
Pillow cases	10
Mosquito nets	10
Examination couch	1
Nurses table	1
Chairs	5
Stools	2
Long benches	2
Drip stands	2
Wall clock	2
Trolley	1
Tall set of drawers on wheels	1
Cabinet with monitor stand	1

**Appendix 2: EAU Medication Ward Stock List**

**Medications**

<b>System</b>	<b>Medication</b>	<b>Number</b>
Alimentary tract and metabolism	ORS Sachets (Oral Rehydration Salts)	10 sachets
	Metformin 500mg tabs	3 tabs
Vitamins	Vitamin B complex tab	4 tabs
	Vitamin K 1mg/ml inj	10 vials
Cardiovascular	Aspirin 75 mg tabs	10 tabs
	Adrenaline 1mg/ml inj	5 vials
	Atropine 1mg/ml inj	4 vials
	Ephedrine 3mg/ml inj	2 vials
	Furosemide 20mg/2ml amp	4 vials
	Glyceryl trinitrate 500microg sublingual tabs	10 tabs
	Hydralazine 20 mg inj	2 vials
	Nifedipine 20 mg tabs	10 tabs
Systemic Hormones	Dexamethasone 5mg inj	4 vials
	Prednisolone 5mg tab	20 tabs
Antibiotics for systemic use	Amoxicillin 500mg tabs	10 tabs
	Ampicillin 1000mg inj	10 vials
	Cloxacillin 1g inj	4 vials
	Ceftriaxone 1 g, powder for injection	4 vials
	Chloramphenicol 1g inj	4 vials
	Ciprofloxacin 200mg inj	10 vials
	Gentamycin 80mg/2ml inj	10 vials
	Metronidazole 500mg inj	10 vials
Antimalarials (antiprotozoa)	ACT (Artesunate 50mg + Amodiaquine 153mg adult) tabs ACT (Artesunate 50mg + Amodiaquine 153mg child) tabs	10 tabs of each
	Quinine dihydrochloride 600mg/2ml amp	8 vials
Nervous System	Diazepam 10mg/2ml inj/rect	5 vials
	Midazolam 1mg/ml inj	2 vials
	Ketamine 50mg/ml, 10ml inj	2 vials
	Phenobarbital 200mg/2ml inj	5 vials
Analgesics	Ibuprofen 400mg tab	10 tabs
	Paracetamol (PCT) 500mg tab	20 tabs
	Tramadol 100 mg/2ml inj	8 vials
Respiratory	Salbutamol Inhaler	1


**Intravenous Fluids**

<b>Fluid</b>	<b>Number</b>
Ringers Lactate	20 X 1 litre bags, 5 X 500ml bags
Normal Saline	10 X 1 litre bags
5% Dextrose	20 X 1 litre bags, 5 X 500ml bags
50% Dextrose	1

**Appendix 3: Training Programme for Nurse Aids assigned to work in the EAU**

<b>Date and Time</b>	<b>Topic</b>	<b>Location</b>
15/10/12 10am	Introductory session	Office
17/10/12 2pm	ABCDE approach to a sick patient	Conference Room
18/10/13 2pm	Triage	Conference Room
23/10/12 2.30pm	Fluid balance Management of the post op patient	Conference Room
24/10/12 2.30pm	Trauma and head injuries	Conference Room
23/11/12 1pm	ISBAR Practical triage scenarios	Conference Room
26/11/12 1pm	Infection prevention and control	Conference Room
Week beginning 3/12/12, various sessions run in small groups	Monitoring of patients Oxygen administration	Emergency Ward

Appendix 4: Acute Admissions Form



**Triage nurse to complete**

Patients name: \_\_\_\_\_ Time and Date of admission: \_\_\_\_: \_\_\_\_ / \_\_\_\_ / \_\_\_\_

Address: \_\_\_\_\_ Route of admission: OPD / direct to ward / ED

Age: \_\_\_\_\_ years \_\_\_\_\_ months Initial observations:

Sex: M / F T \_\_\_\_\_ °C P \_\_\_\_\_ bpm BP= \_\_\_\_ / \_\_\_\_ O2 Sats \_\_\_\_\_ % RR \_\_\_\_\_

Weight: \_\_\_\_\_ kg Triage nurse: \_\_\_\_\_

Registration book number: \_\_\_\_\_ Triage category: **Immediate / urgent / routine**

Bed number \_\_\_\_\_ Ward \_\_\_\_\_

---

**CHO / Doctor to complete**

Admitting CHO / Doctor: \_\_\_\_\_

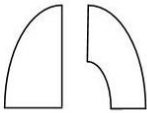
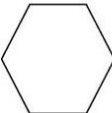
Reason for admission: \_\_\_\_\_

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 5: Admission to HDU Form**

**Admission to High Dependency Unit**

Patients name: \_\_\_\_\_ Date: \_\_\_\_\_

Address: \_\_\_\_\_ Age: \_\_\_\_\_

Diagnosis: 1. \_\_\_\_\_  
2. \_\_\_\_\_  
3. \_\_\_\_\_

Investigations pending: \_\_\_\_\_

**Ongoing care requirements**

Frequency of observations: every 15 minutes / hourly / QDS / other: \_\_\_\_\_

Medication requirements: Drug chart MUST also be consulted for full prescription and dose

Antibiotics frequency: QDS / TDS / BD / OD  
Quinine / ACT  
Analgesia  
Other: \_\_\_\_\_

IV fluid/blood requirements: If any IV fluid is required also complete fluid balance chart overleaf

	Required?	Prescription
Ringer's Lactate		
Normal Saline		
D5		
Blood		

Urine output monitoring: required: yes / no  
method: catheter / measurement of output  
frequency: hourly / QDS / OD

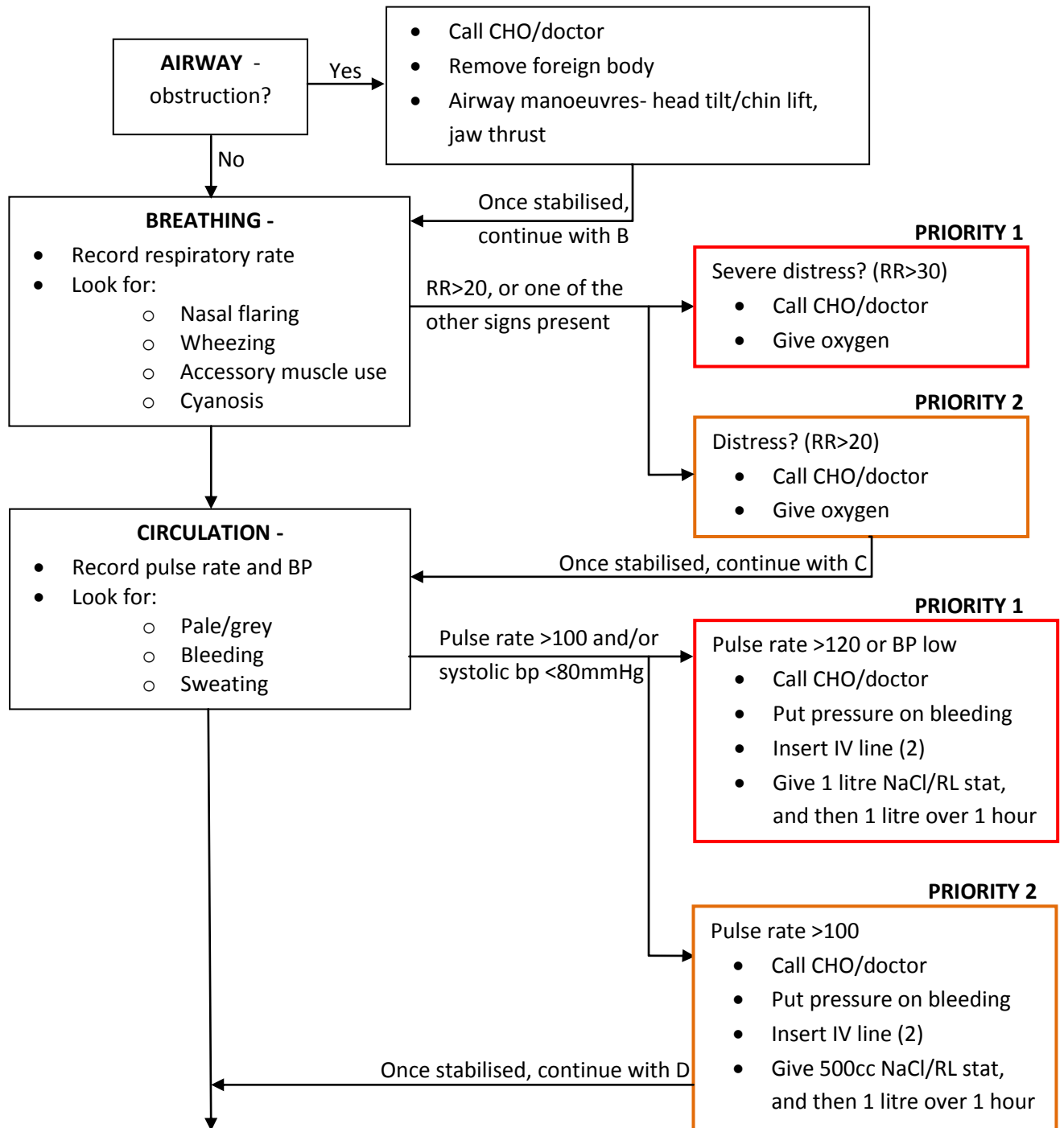
Additional nursing care: turn patient regularly / mouth care / encourage to mobilise  
Other: \_\_\_\_\_

Appendix 6: Provisional Adult Protocols

**Triage Protocol for Emergency Admissions Unit**

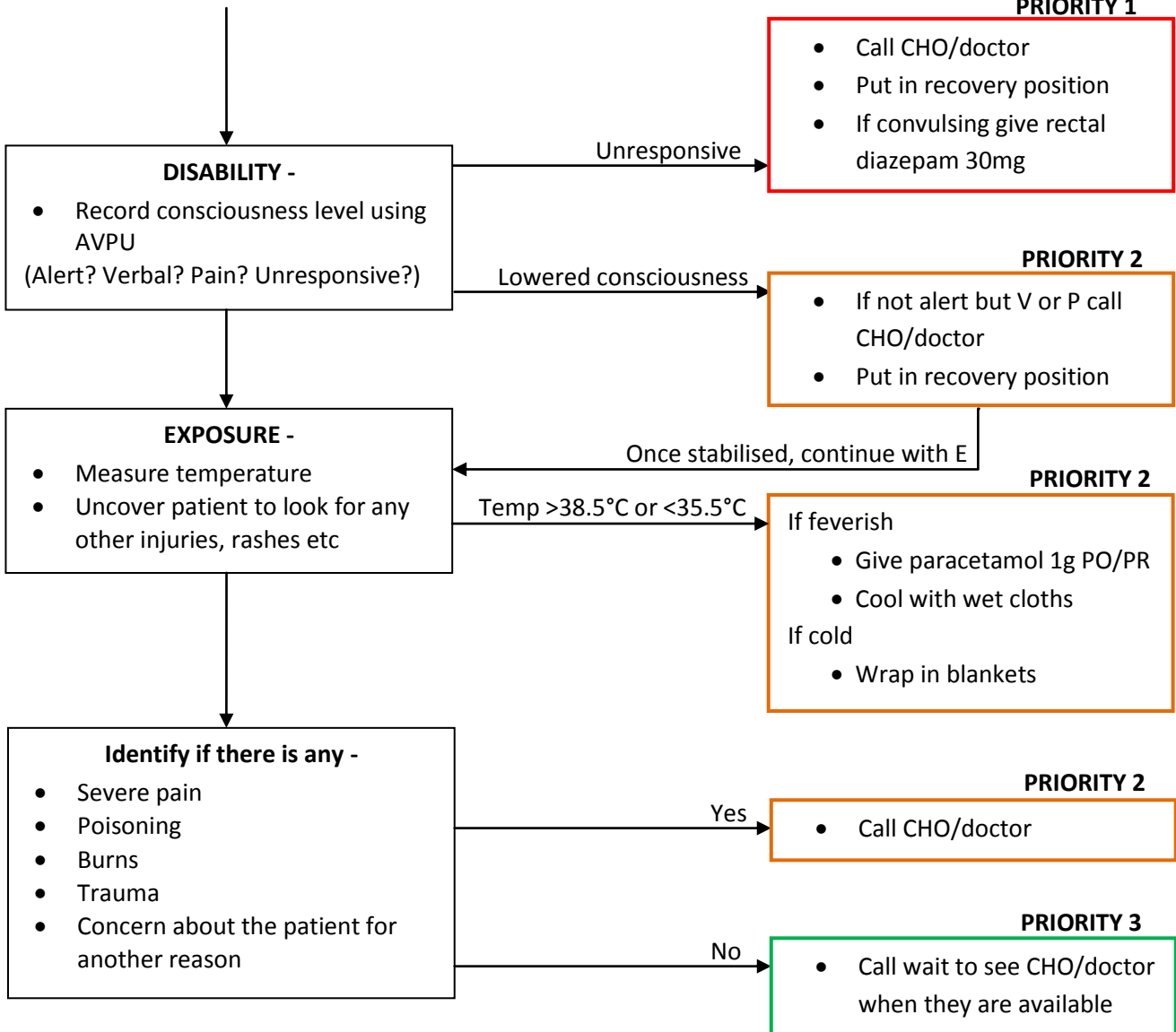
Three triage categories are used:

- **Priority 1** – for patients with emergency signs requiring immediate life saving care;
- **Priority 2** – for patients with priority signs requiring urgent care;
- **Priority 3** – for patients whose needs are not urgent.



Please turn over for D and E

Adult Triage Protocol cont...



## A1 - Airway Problem

### 1. CLINICAL SIGNS:

- Choking
- Stridor, noisy breathing particularly on inspiration
- Noisy, snoring type breathing in the unconscious patient
- No chest wall movement in complete obstruction

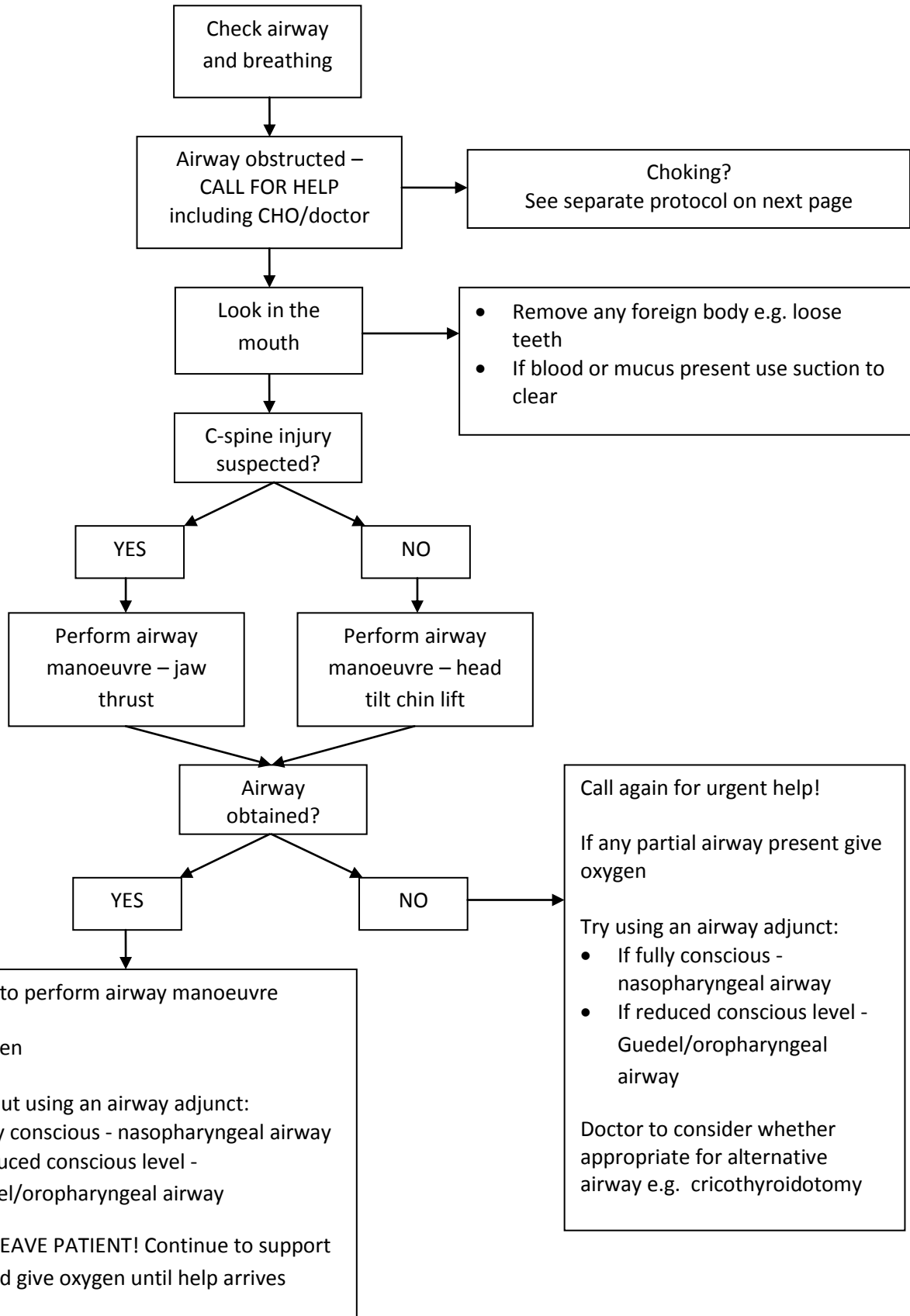
### 2. POSSIBLE CAUSES:

- **Reduced level of consciousness**
  - Tongue has fallen back and is blocking the airway
- **Foreign body aspiration**
- **Anaphylaxis**
  - Type of severe allergic reaction, requires trigger
  - Laryngeal oedema can block the airway
  - Requires management of airway and also urgent administration of adrenaline (see C2 anaphylaxis protocol)
- **External compression**
  - e.g. from a very large cervical mass
- **Dental Abscess**
  - History of dental pain and fever
  - Can have cervical swelling, which pushes tongue superiorly – Ludwig's Angina

### 3. TREATMENT:

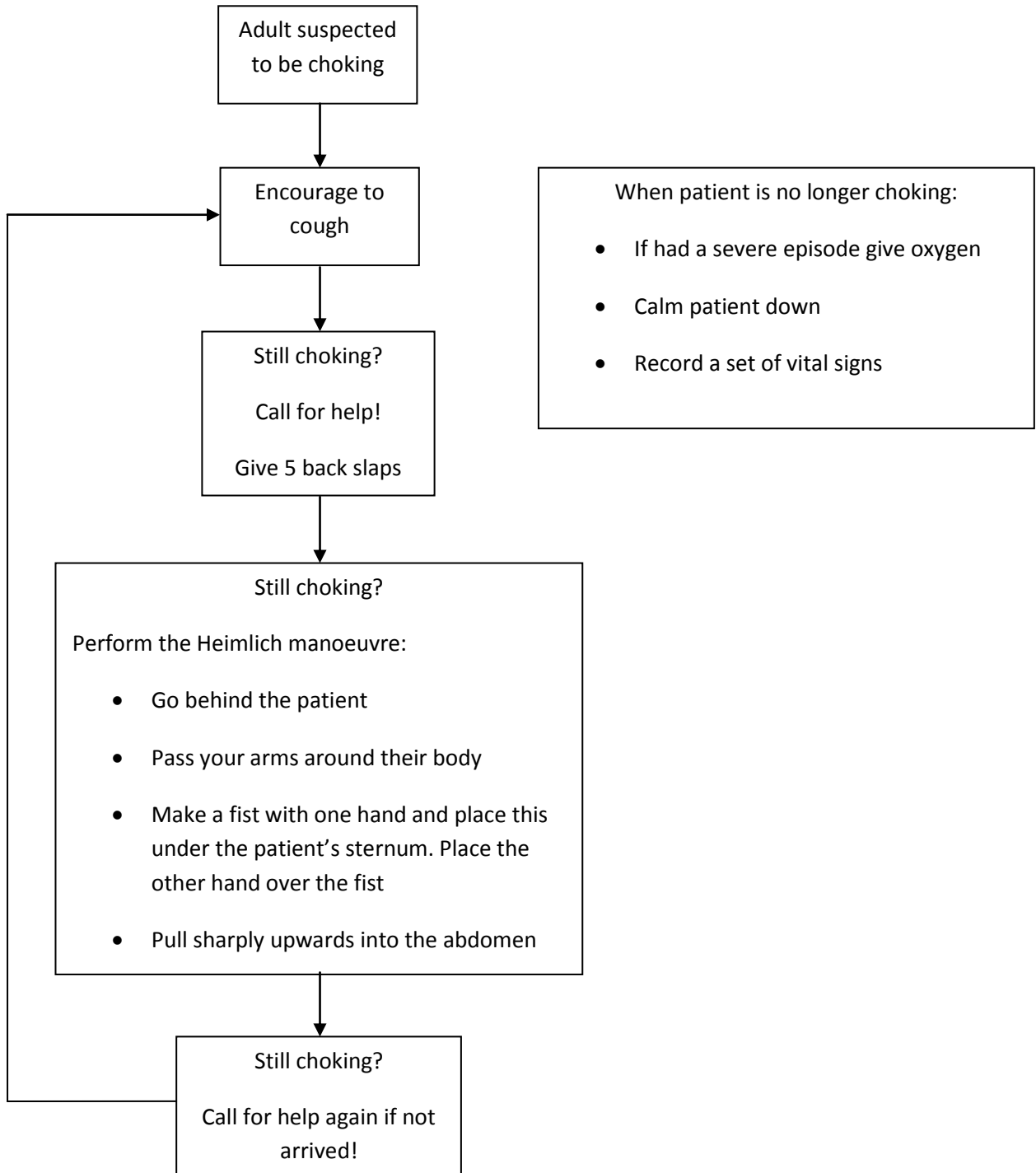
A1 – Airway Problem Protocol cont...

**Airway Obstruction**



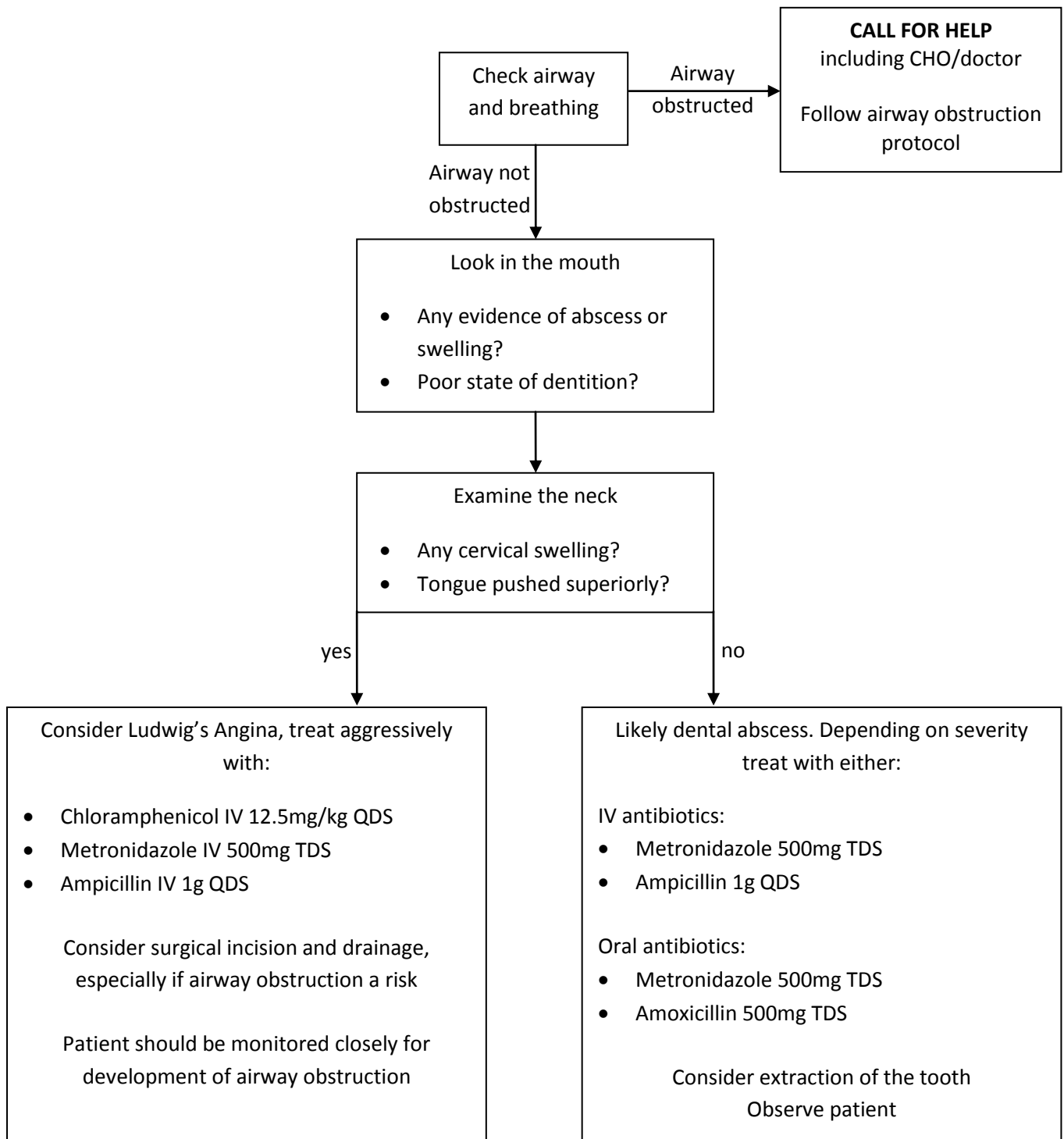
A1 – Airway Problem Protocol cont...

Choking



A1 – Airway Problem Protocol cont...

Dental Abscess



## B1 - Severe Asthma

### 1. DEFINITIONS:

- A disorder of the airways with a combination of:
  - Constriction of the smooth muscle in the airways
  - Bronchial wall inflammation
- Together leading to reversible airflow obstruction
- Caused by a combination of genetic susceptibility and a triggering factor such as:
  - Infections (especially viral infections in children)
  - Environmental pollutants e.g. cigarette smoke
  - Allergens e.g. food, dust

### 2. CLINICAL SIGNS:

- History of:
  - Wheeze, cough (especially in the mornings), chest tightness
  - Previous episodes
  - Triggering factors
  - Family history of asthma
- Clinical signs in severe asthma
  - Respiratory rate > 25 breaths per minute
  - May be unable to talk in sentences
  - Wheeze present on auscultation, especially during expiration
  - Pulse rate >110 beats per minute
- Signs of life threatening asthma
  - Silent chest or cyanosis
  - Exhaustion, confusion or decreased consciousness
  - Bradycardia or hypotension

### 3. TREATMENT:



**B1 – Severe  
Asthma Protocol  
cont...**

Check airway

If any sign of airway obstruction present deal with this immediately - refer to obstructed airway protocol.  
Call for help!

Assess breathing

If patient is visibly short of breath give oxygen straight away and call for help!

- Record a full set of vital signs
- Observe if any cough
- Auscultate for wheeze
- Look for central cyanosis
- Observe conscious level of patient (AVPU)

If any of:

- respiratory rate is > 25 breaths per minute
- oxygen saturations are <94%
- any features of severe or life threatening asthma

Act fast! Give oxygen straight away and call for help!

If asthma, as described above, likely:

- Give oxygen aiming for saturations >96%
- **Give salbutamol 5mg by nebuliser. If no nebuliser available give as best as possible with inhaler (use spacer if available)**

Also give steroids, in adults either:

- If can take oral medication - prednisolone 40 mg
- If unable to take oral medication - hydrocortisone 200 mg slowly intravenously (if available)

If improving:

- Continue to give oxygen if needed to maintain sats >96%
- Give salbutamol nebulisers 5mg QDS
- Continue prednisolone 40mg OD for 5 days

If not improving:

- Continue oxygen administration, giving up to 8L if needed to achieve sats >96%
- Give frequent salbutamol nebulisers, 5mg up to every 15 minutes
- Record vital signs every 15 minutes
- If not present ALERT DOCTOR!

## B2 - Severe Pneumonia

### 1. DEFINITIONS:

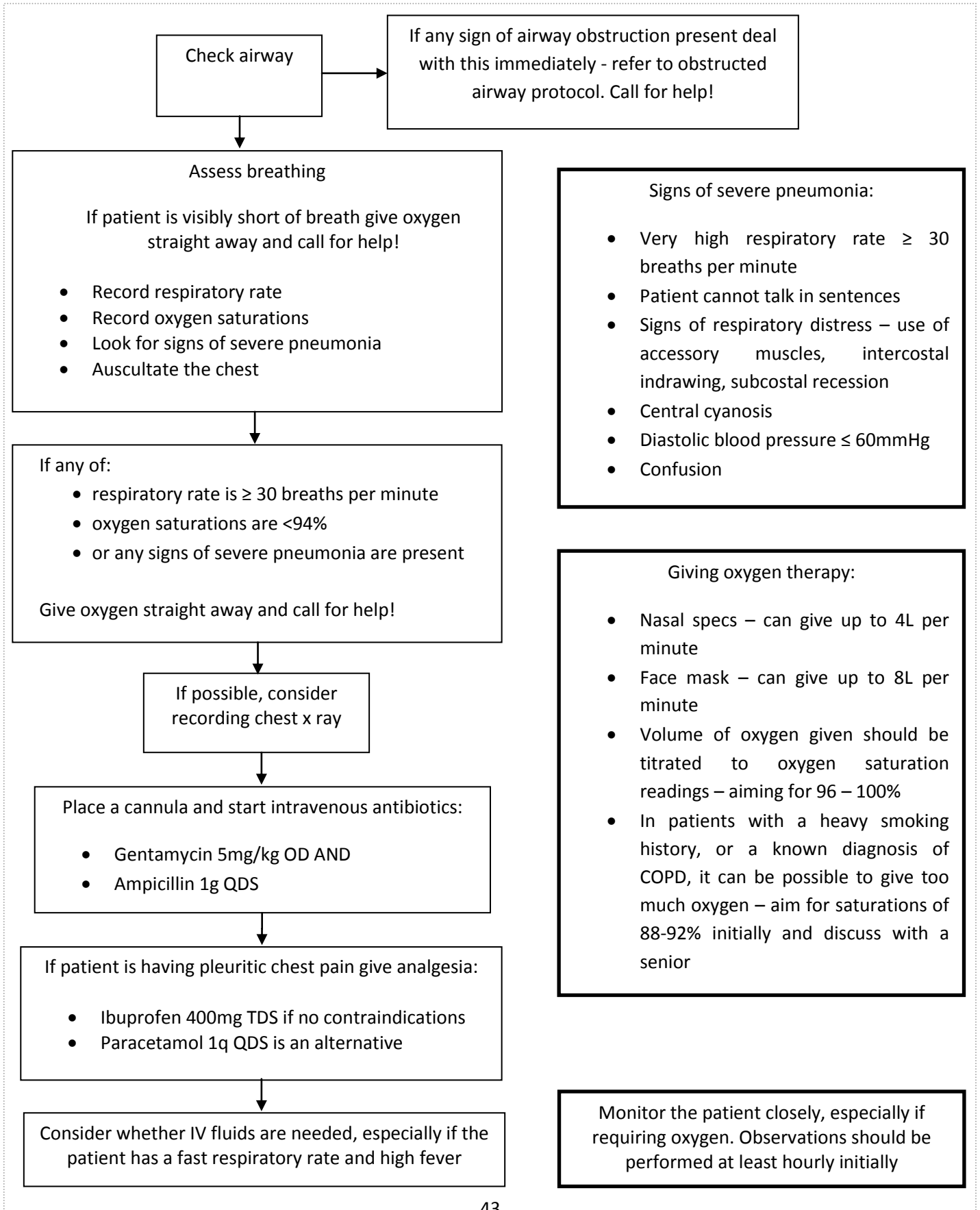
- Pneumonia
  - Inflammation of the substance of the lungs
  - Most commonly caused by bacteria, especially *streptococcus pneumoniae* but can also be viruses and fungal infections
- Site
  - Lobar pneumonia – pneumonia affecting a single lobe
  - Bronchopneumonia – diffuse pneumonia affecting multiple lobes and the bronchi and bronchioles
- Aspiration pneumonia
  - From inhalation of stomach contents, blood or saliva

### 2. CLINICAL SIGNS:

- Pneumonia
  - Cough
  - High respiratory rate 20 – 30 breaths per minute
  - Fever
  - Pleuritic chest pain
  - Auscultation reveals added sounds such as crackles or crepitations. Bronchial breathing may be present
- Severe pneumonia
  - Very high respiratory rate  $\geq 30$  breaths per minute
  - Patient cannot talk in sentences
  - Signs of respiratory distress – use of accessory muscles, intercostal indrawing, subcostal recession
  - Central cyanosis
  - Diastolic blood pressure  $\leq 60$ mmHg
  - Confusion

### 3. TREATMENT:

B2 – Severe Pneumonia Protocol cont...



## B3 - Tension Pneumothorax

### 1. DEFINITIONS:

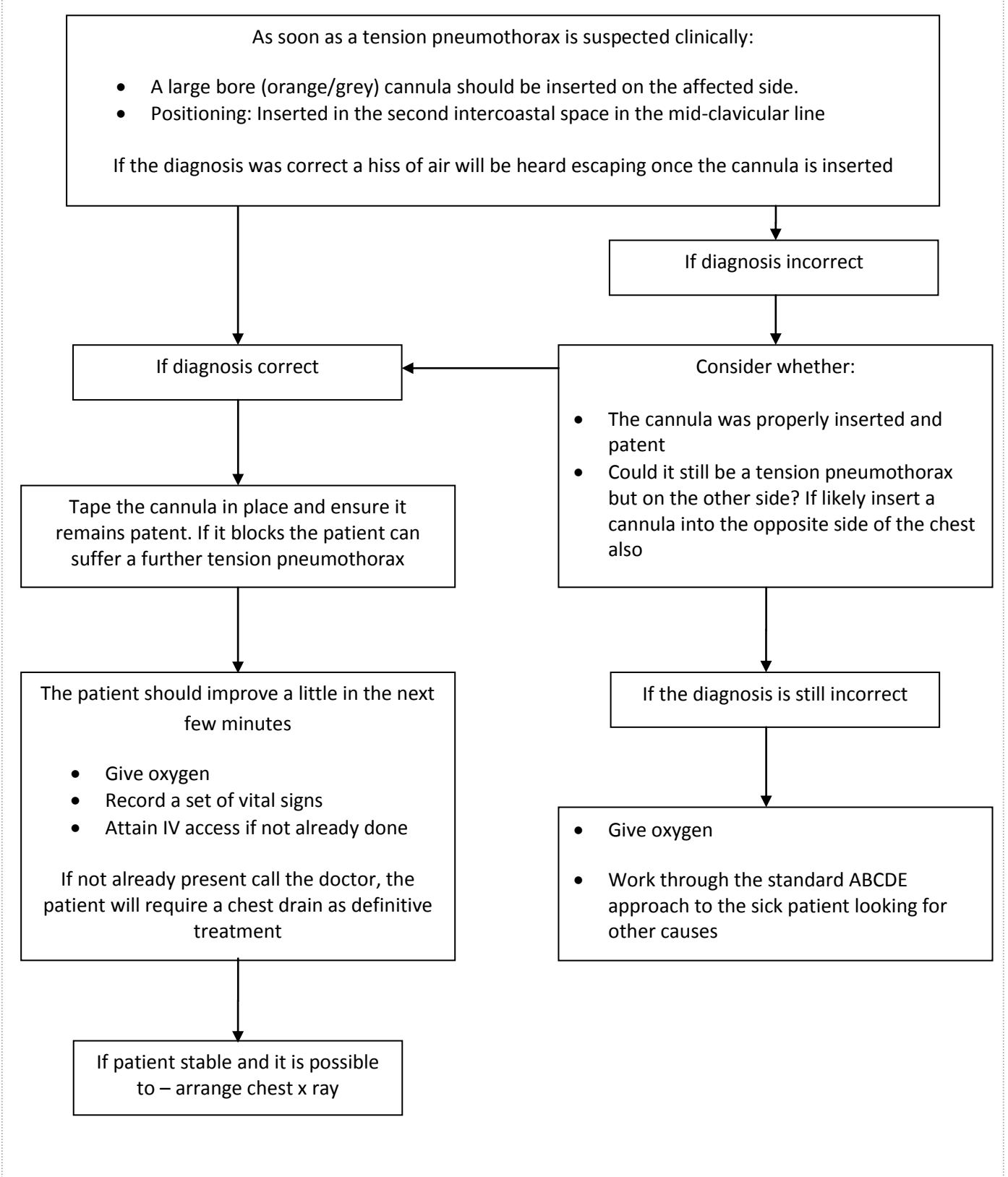
- Air in the pleural cavity which is rapidly expanding and causing collapse of the lung, and may progress to cause shift of the mediastinum and collapse also of the other lung

### 2. CLINICAL SIGNS:

- Unwell, distressed patient. Deteriorating RAPIDLY!
- Very high respiratory rate, likely to be  $\geq 30$  breaths per minute
- Patient cannot talk in sentences
- Progressively increasing hypoxia, can be demonstrated by:
  - low oxygen saturations
  - cyanosis
  - Increasing confusion
- As compression of the mediastinum occurs patient develops:
  - Distended neck veins
  - Hypotension
- Signs on respiratory exam include:
  - Trachea shifted away from side of tension pneumothorax
  - Hyperresonant to percussion on affected side

### 3. TREATMENT:

B3 – Tension Pneumothorax Protocol cont...



## C1 - Shock

### 1. CLINICAL SIGNS:

- Tachycardia, pulse rate > 100
- Hypotension, systolic bp < 100
- Increased capillary refill time

### 2. POSSIBLE CAUSES:

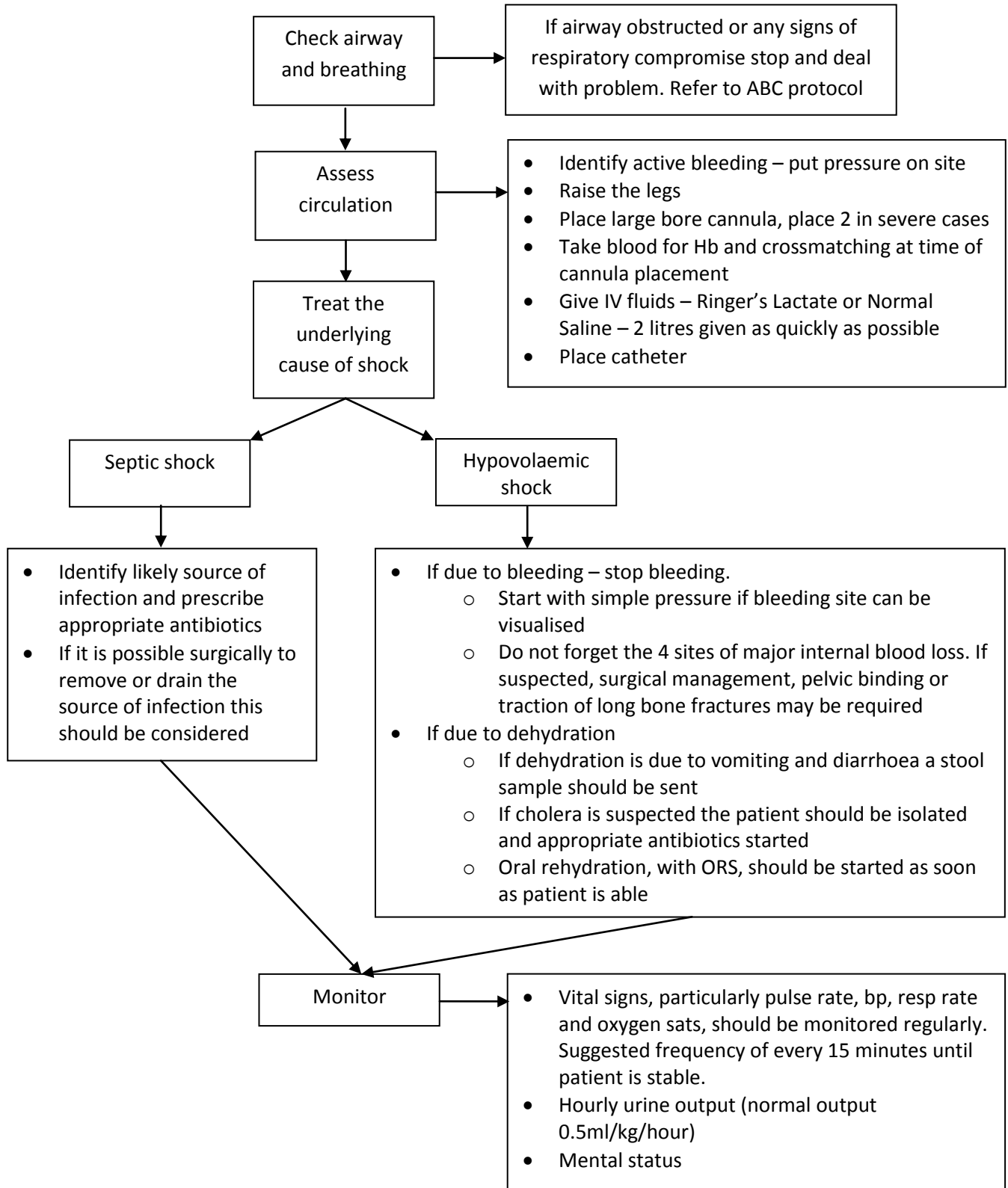
- **Sepsis**
  - Shock associated with septicaemia
  - Fever often present
  - Vasodilation, warm peripheries
- **Hypovolaemia**
  - Can be from severe dehydration or blood loss
  - Blood loss can be external and easily visible or from 4 areas of major internal blood loss – chest, abdomen, pelvis, long bones
  - Cold peripheries
  - Cold, clammy skin
- **Anaphylaxis**
  - Type of severe allergic reaction, requires trigger
  - Oedema, urticaria, erythema
  - Vasodilation, warm peripheries
  - Be alert for laryngeal oedema and bronchospasm
- **Cardiogenic**
  - Heart fails to pump sufficiently to maintain good output
  - Raised JVP
  - Pulmonary oedema

### 3. TREATMENT:

- **Anaphylactic shock – see separate protocol**

C1 – Shock Protocol cont...

• Septic and hypovolaemic shock



**C1 – Shock Protocol cont...**

- Further management
  - More IV fluids are often required. But the response of the patient should be assessed first. Most patients will show some improvement with the initial 2 litres, signs of this can be a good urine output, reduction in tachycardia and improved conscious level.
  - If shock is due to blood loss or Hb is low blood transfusion should be given
  - It is possible to fluid overload a patient. In a shocked adult it is unusual for this to happen before at least 4 litres of fluid have been given. Be particularly aware of this risk in patients with a history of heart problems.
  
- **Cardiogenic shock**
  - Management may include oxygen administration, analgesia and treatment of the cause if possible.
  - Needs to be decided on an individual patient basis in consultation with senior medical staff.



## C2 - Anaphylaxis

### 1. DEFINITION:

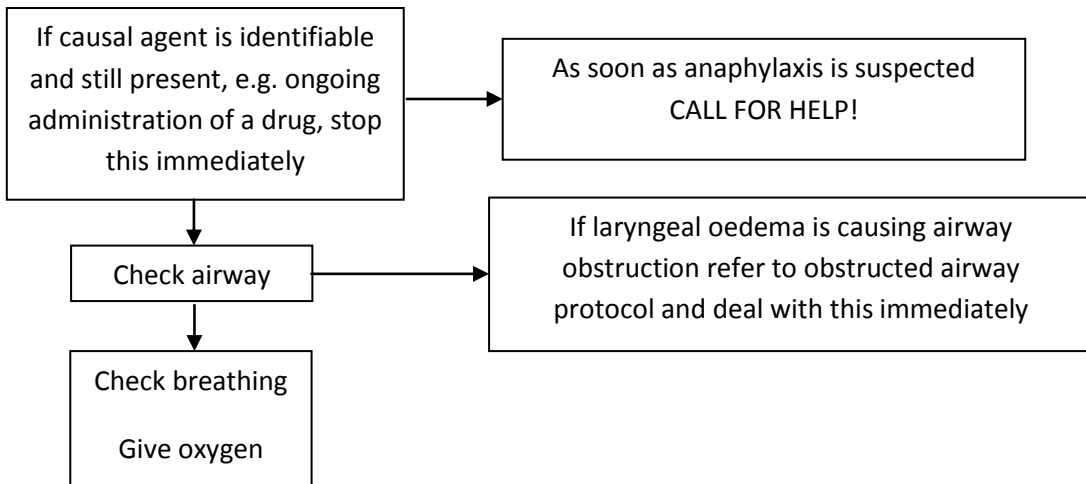
- Type I hypersensitivity reaction
- Requires a trigger, triggers can include:
  - Drugs
  - Insects bites/stings
  - Certain foods

### 2. CLINICAL SIGNS:

- Early signs
  - Erythema
  - Urticaria
  - Feeling of anxiety
- Hypovolaemic shock/signs of profound vasodilation
  - Warm peripheries
  - Low blood pressure
  - Tachycardia
- Oedema
  - Tissue oedema e.g. swollen face
  - Pulmonary oedema
  - Be alert for laryngeal oedema - patient develops dyspnoea and stridor – if this occurs there is a high risk of airway obstruction
- Bronchospasm – chest auscultation reveals wheezing and rhonchi
- Rhinitis
- Nausea, vomiting, abdominal cramps, diarrhoea

### 3. TREATMENT:

C2 –  
Anaphylaxis  
Protocol  
cont...



Assess circulation

If patient is likely to have hypovolaemic shock

- Raise the legs

**Give INTRAMUSCULAR adrenaline – repeat every 5 minutes for as long as shock persists - see adjacent box for doses**

- Place large bore cannula, place 2 in severe cases
- Give IV fluids – Ringer’s Lactate or Normal Saline – 2 litres given as quickly as possible

**Give INTRAMUSCULAR adrenaline**

In **adults** give 0.5mg this is equal to:

- 0.5ml of 1 in 1000 solution (1mg/ml)
- 5ml of 1 in 10 000 solution (0.1mg/ml)

In **children** give:

- 0.01ml/kg of 1 in 1000 solution (1mg/ml)
- 0.1ml/kg of 1 in 10 000 solution (0.1mg/ml)

**DO NOT GIVE INTRAVENOUSLY – CAN CAUSE CARDIAC ARRHYTHMIAS**

Give further medications for anaphylaxis, in adults:

- If can take oral medication - prednisolone 40 mg and chlorphenamine 4 mg
- If unable to take oral medication - hydrocortisone 100 – 300 mg slowly intravenously (if available)

If patient not improving:

- Alert doctor if not already present!
- Repeat IM adrenaline every 5 minutes for as long as shock persists
- Treat bronchospasm with nebulised salbutamol 5mg, up to every 15 minutes, as required
- Give further IV fluids

## C3 – Heart Failure

### 1. DEFINITIONS:

The cardiac output from one or both sides of the heart is insufficient for the needs of the body.

High output cardiac failure – when heart failure arises as result of very high requirements of the body.

Low output cardiac failure – when the body's requirements are normal but the heart fails to generate an adequate output.

A patient can have an isolated left heart failure or more rarely an isolated right heart failure. Most patients will have congested or biventricular heart failure in which left ventricular failure occurs first and leads to right heart failure also.

### 2. CAUSES:

High output cardiac failure: anaemia, hyperthyroidism, pregnancy

Low output cardiac failure:

- Intrinsic heart muscle disease – ischaemic heart disease, myocarditis
- Increased afterload – hypertension, aortic stenosis
- Valvular heart disease
- Restricted filling – constrictive pericarditis, tamponade
- Inadequate heart rate – beta-blockers, problems with the conducting system

### 3. CLINICAL ASSESSMENT:

A full history and examination should be performed.

Patients with heart failure may report:

- Fatigue
- Limited exercise tolerance
- Orthopnoea
- Nocturnal dyspnoea and cough
- Retaining fluids/weight gain
- Abdominal distension
- History of heart disease/hypertension

Physical examination:

Observations -

- High respiratory rate
- High pulse rate
- Blood pressure can be low, normal or high

C3 – Heart Failure Protocol cont...

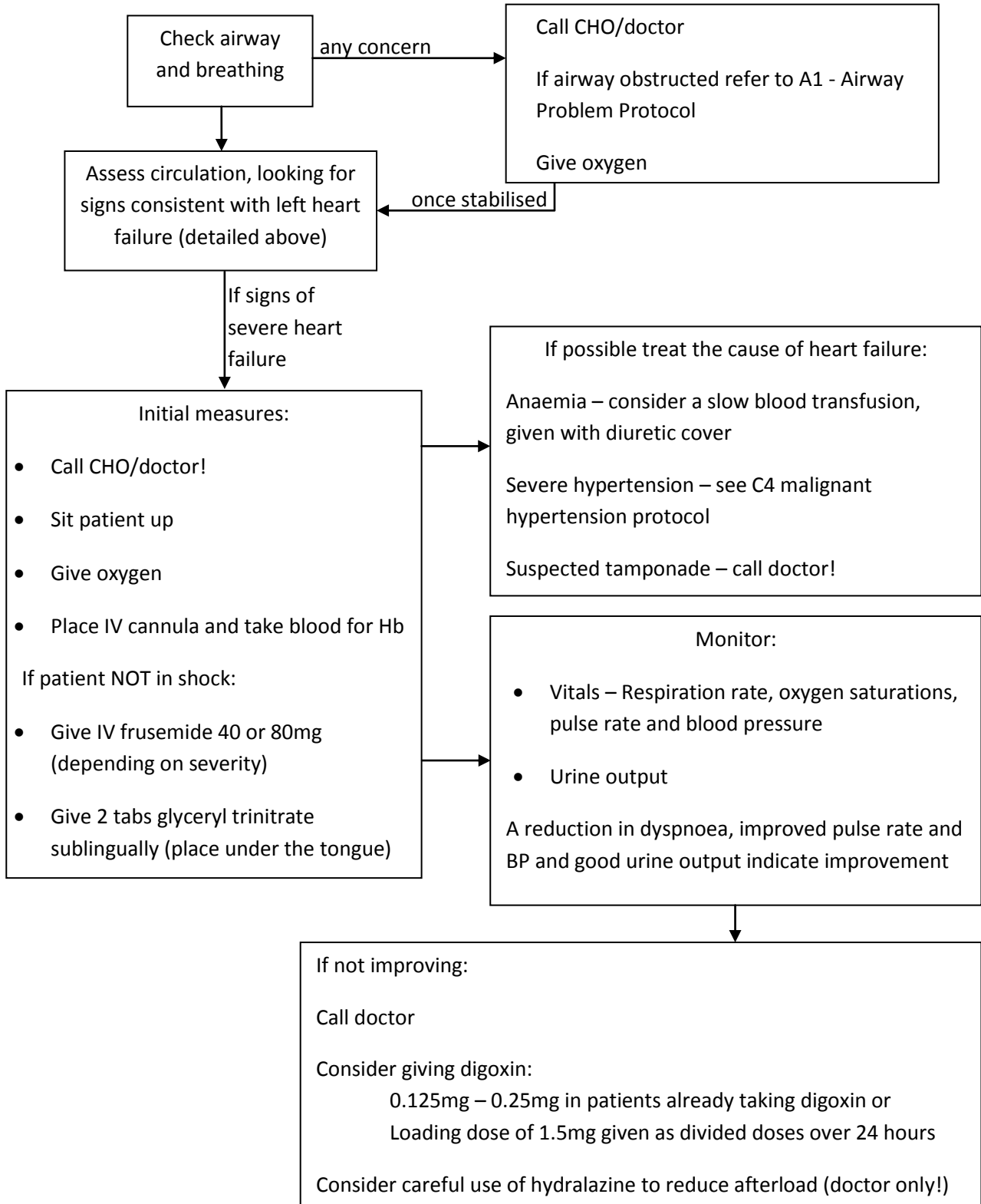
Physical examination cont....

Right-sided failure	Left-sided failure
Raised JVP	Dyspnoea and orthopnoea
Peripheral oedema	Cough with blood stained frothy sputum
Enlarged liver	Crepitations at lung bases
Ascites	In severe cases – cyanosis and shock
Heart sounds – can have functional tricuspid regurgitation (pansystolic murmur)	Heart sounds – can have gallop rhythm (third heart sound) or functional mitral regurgitation (pansystolic murmur)
	May also cause right sided failure and have signs of this

C3 – Heart Failure Protocol cont...

**4. MANAGEMENT OF LEFT HEART FAILURE:**

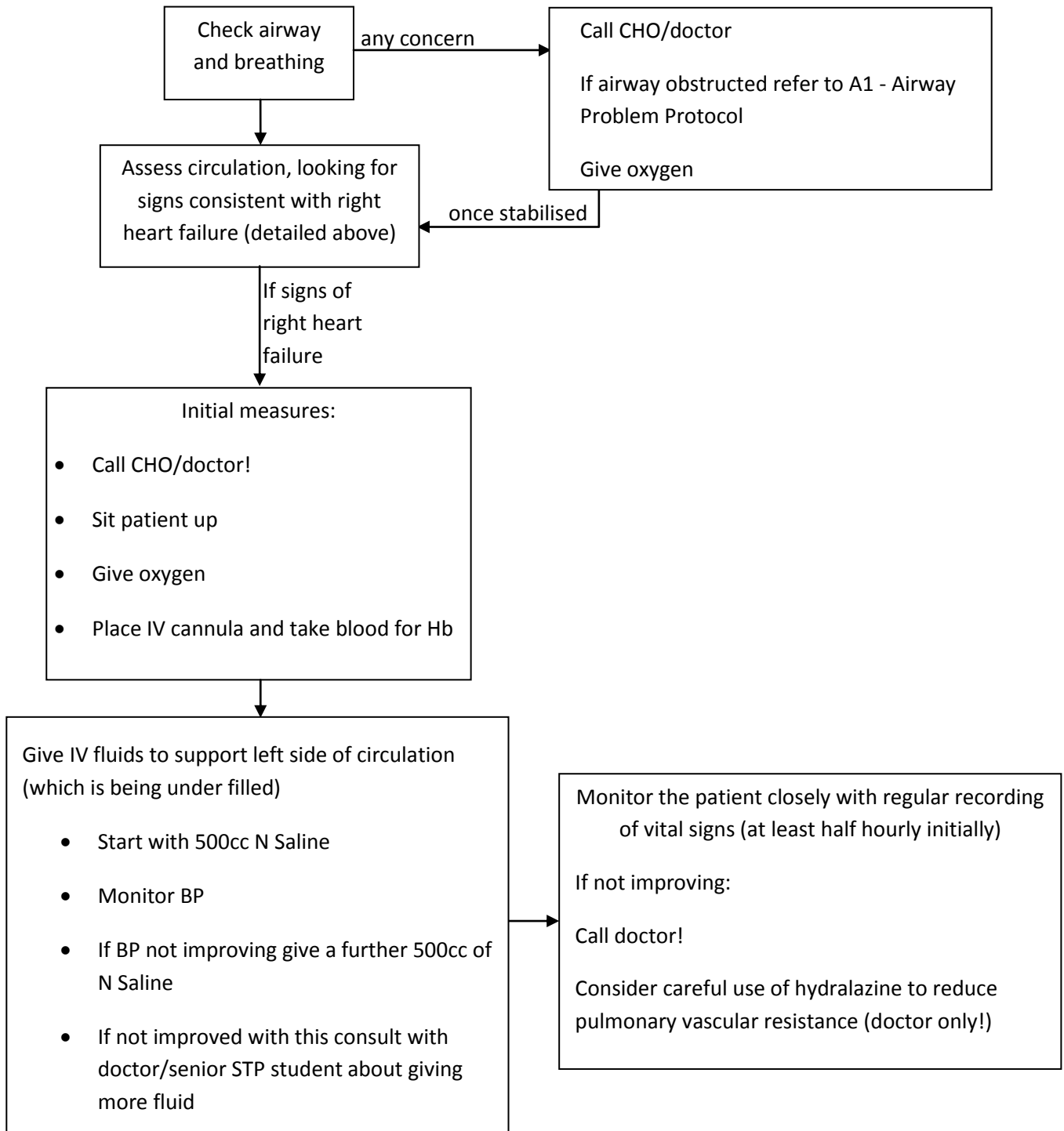
This is the management of severe heart failure for the patient with abnormal vital signs fitting triage category priority 1/2. Stable patients with normal vitals should be treated as per the OPD protocols.



C3 – Heart Failure Protocol cont...

**5. MANAGEMENT OF RIGHT HEART FAILURE:**

Patients who have right heart failure as a consequence of left heart failure (i.e. if any signs of left heart failure are also found) should be managed as per the left heart failure protocol. This protocol is for isolated right heart sided failure which is not very common!



NB Diuretics are not indicated in isolated right sided heart failure

## C4 – Malignant Hypertension

### 1. DEFINITIONS:

Malignant or accelerated hypertension occurs when the blood pressures rises rapidly and is severely high (diastolic  $\geq 120$ mmHg or systolic  $\geq 220$ mmHg).

The patient is at risk of renal failure, heart failure, aortic dissection and stroke.

### 2. CAUSES:

Often primary hypertension but always consider whether it could be secondary to another cause e.g. pheochromocytoma.

### 3. CLINICAL ASSESSMENT:

Take a history, including enquiring about:

- Headaches
- Visual disturbance
- Convulsions
- Loss of consciousness
- Chest pain/angina
- Symptoms of left ventricular failure – fatigue, exertional dyspnoea, orthopnoea, paroxysmal nocturnal dyspnoea
- Attacks of sweating and palpitations (suggests pheochromocytoma)

Full examination should be undertaken including looking for signs of left ventricular failure and fundoscopy.

### 4. MANAGEMENT:

- Patients with malignant hypertension should be admitted
- The aim is to achieve a smooth, slow reduction of the blood pressure. Dropping the blood pressure too quickly can result in myocardial infarction, cerebral ischaemia or acute renal failure

If there is evidence of **life threatening end organ damage** (encephalopathy, intracranial haemorrhage, unstable angina, acute myocardial infarction, acute left ventricular failure, suspicion of aortic dissection):

- Call doctor!
- Aim to reduce the diastolic pressure to 110-115mmHg in 4-6 hours
  - Give hydralazine 10mg IV (given slowly)
  - Monitor the blood pressure closely, at least every 15 mins, initially
  - Hydralazine 10mg IV can be repeated after 20-30mins as necessary

- A side effect of hydralazine is reflex tachycardia which can be controlled with propranolol 40 mg TDS or 80mg BD

**C4 – Malignant Hypertension Protocol**

- Over the next 24 – 48 hours treatment should aim to achieve a diastolic pressure of 100-110mmHg
- IV medication is used to lower the blood pressure in the acute stage. The patient should then be transferred onto, and stabilised on, oral medications aiming to achieve a diastolic pressure of 90-100mmHg before discharge

If there is **no evidence of life threatening end organ damage:**

- Aim to reduce the diastolic pressure to 110-115mmHg over 24 – 48 hours
  - Use oral medication
  - Start with nifedipine 10mg
  - Monitor the blood pressure, every 30 mins, initially
  - A further nifedipine 10mg can be given after 2 hours if needed
- Aim to get patient slowly onto higher doses, e.g. nifedipine 20mg TDS, with a final diastolic pressure of 90-100mmHg before discharge



## D1 – Unconscious Patient /Coma

### 1. DEFINITIONS:

A state of altered consciousness

### 2. CLINICAL ASSESSMENT:

Includes the need to record level of consciousness, 2 systems can be used:

- The more straightforward AVPU system:
  - A – alert
  - V – responding to voice
  - P – responding to pain
  - U – unresponsive
- For some patients the more complex Glasgow Coma Scale (GCS) is useful:

Patient Response		Score
Eyes open	Spontaneously	4
	To speech	3
	To pain	2
	Not at all	1
Best verbal response	Orientated	5
	Confused	4
	Inappropriate words	3
	Incomprehensible sounds	2
	None	1
Best motor response	Obeys commands	6
	Localises pain	5
	Withdraws from pain	4
	Flexion to pain	3
	Extension to pain	2
	None	1

NB: the minimum score a patient can have is 3

D1 – Unconscious Patient/Coma Protocol cont...

**3. CAUSES:**

A wide range of conditions may cause coma and specific treatment should be directed at this. These include:

- Cerebral malaria
- Hypo- or hyperglycaemia
- Poisons, drugs, alcohol, intoxication
- Head Injury/Trauma
- Meningitis – bacterial, viral, TB, cryptococcal
- Encephalitis
- Hypoxia
- Raised intracranial pressure e.g. intracranial haemorrhage, a space occupying lesion
- Postictal state

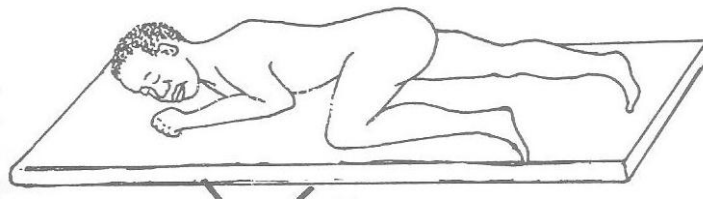
Less common causes:

- Electrolyte imbalance especially hypo- or hypernatraemia
- Hypothyroidism
- Uraemia

**4. MANAGEMENT:**

General approach to the unconscious patient:

- Assess the patient using an ABCDE approach, recognising and treating problems as they are found
- Ensure the blood glucose level is checked and corrected if necessary
- If there is no suspicion of a c spine injury – put the patient in the recovery position



- Take a good history from the relatives, with focus on possible causes. Including:
  - Did anyone see how they became unconscious?
  - Is there any history of alcohol or drug use?
  - Does the patient have any past medical history?

**D1 – Unconscious Patient/Coma Protocol cont...**

- Perform a full clinical examination including an assessment of consciousness level – AVPU or GCS

Useful clinical features:

- Fever - Meningitis or encephalitis  
Cerebral malaria  
Septicaemia
- Hypothermia - Hypothyroidism
- Hypertension - CVA
- Hypotension - Shock (leading to cerebral hypoxia)
- Bleeding/bruising to the head - Head injury

- Treat the patient according to likely cause
- Monitor the patient closely including repeat assessment of consciousness level. The clinician should be alert to causes of secondary brain injury:

Cause	Management
Hypoxia	Secure airway and breathing, give oxygen
Shock	Stop bleeding, resuscitate. See C1 Shock protocol
Infection	Identify source, antibiotics
Convulsions	See D2 Convulsions protocol
Hypoglycaemia	Give 50ml of 20% dextrose, set up 5% dextrose infusion

Further considerations:

- Turning  
The patient should be turned 2 hourly to prevent pressure sores
- Fluid balance  
An unconscious patient is likely to require IV fluids and catheterisation. Their fluid balance should be recorded and monitored
- Pneumonia  
It is common for unconscious patients to develop pneumonia. If possible chest physiotherapy is helpful in prevention of this. Clinicians should be alert for the signs of a pneumonia developing
- Nutrition  
If after 48 hours the patient remains incapable of oral intake feeding via a NG tube should be considered
- Mouth care  
Should be carried out several times a day in the unconscious patient

## D2 – Convulsions/Seizures/Fitting

### 1. DEFINITIONS:

Due to spontaneous, abnormal electrical discharge from the brain. Can be focal (petit mal) or generalised (grand-mal). In generalised seizures a tonic-clonic pattern can be seen with repeated jerking type contractions of the limbs. During a fit it is possible the patient will bite their tongue or be incontinent of faeces and/or urine.

After having convulsions a patient will have a postictal period where they are drowsy and sometimes unrousable. They may also be confused. This period does not normally last more than 2-3 hours.

When a patient has a series of fits without the return of consciousness between them, or seizures lasting over 30 minutes, this is called status epilepticus. During status cerebral oxygen supply is often affected and permanent brain damage can occur.

### 2. CAUSES:

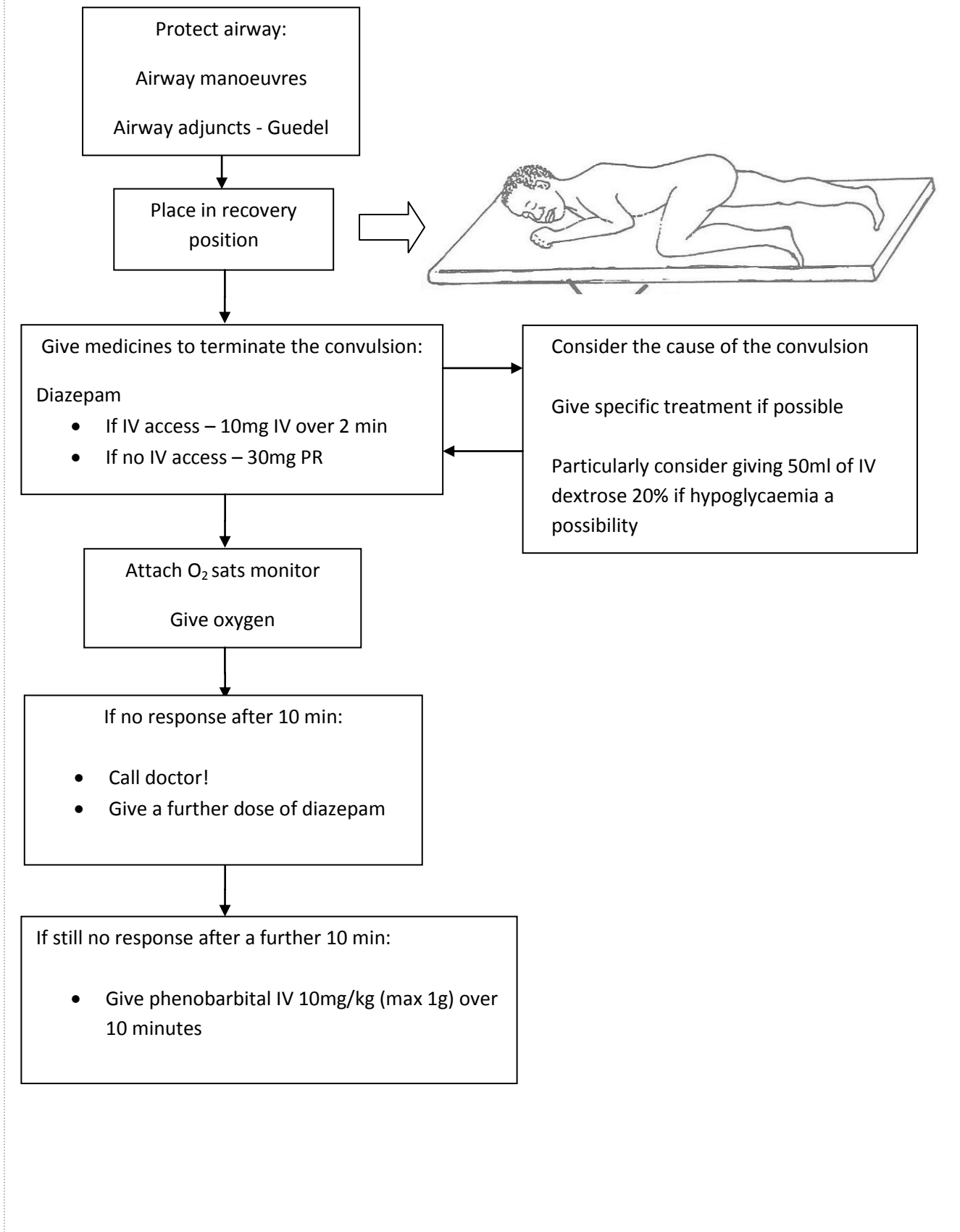
A wide range of conditions may cause convulsions. These include:

- Cerebral malaria
- Meningitis
- Encephalitis
- Head Injury/Trauma
- Alcohol withdrawal
- Poisoning, drugs
- Primary epilepsy
- Hypo- or hyperglycaemia
- Hypernatraemia
- Hypoxia
- Intracranial haematoma
- Cerebral tumour or abscess
- Hypertensive encephalopathy

### 3. MANAGEMENT:

For the acutely convulsing patient:

D2 – Convulsions/Seizures/Fitting Protocol cont...



## E1 – Fever

### 1. DEFINITIONS:

Temperature  $>37.5^{\circ}\text{C}$  constitutes fever.  
 Temperatures of  $37.5^{\circ}\text{C} - 38.5^{\circ}\text{C}$  are classified as mild fever.  
 Temperatures  $>38.5^{\circ}\text{C}$  are classed as high fever.

Fevers can be intermittent or constant. They can be accompanied by drenching sweats or rigors (uncontrollable shaking lasting several minutes) these features are significant.

### 2. CAUSES:

Infections (bacterial, viral, parasitic, fungal) are the most common cause.  
 Other possible causes include malignancy (e.g. lymphoma, renal cell carcinoma), inflammatory conditions, drug reactions and endocrine (e.g. hyperthyroidism).

### 3. CLINICAL ASSESSMENT:

A full history and examination of all systems is required.

The febrile patient, particularly if suffering from septicaemia, may also show signs of shock (systolic bp  $<100\text{mmHg}$ , pulse  $>100\text{ bpm}$ ) and the clinician should be alert to this.

If an infection is suspected, localising signs should be sought:

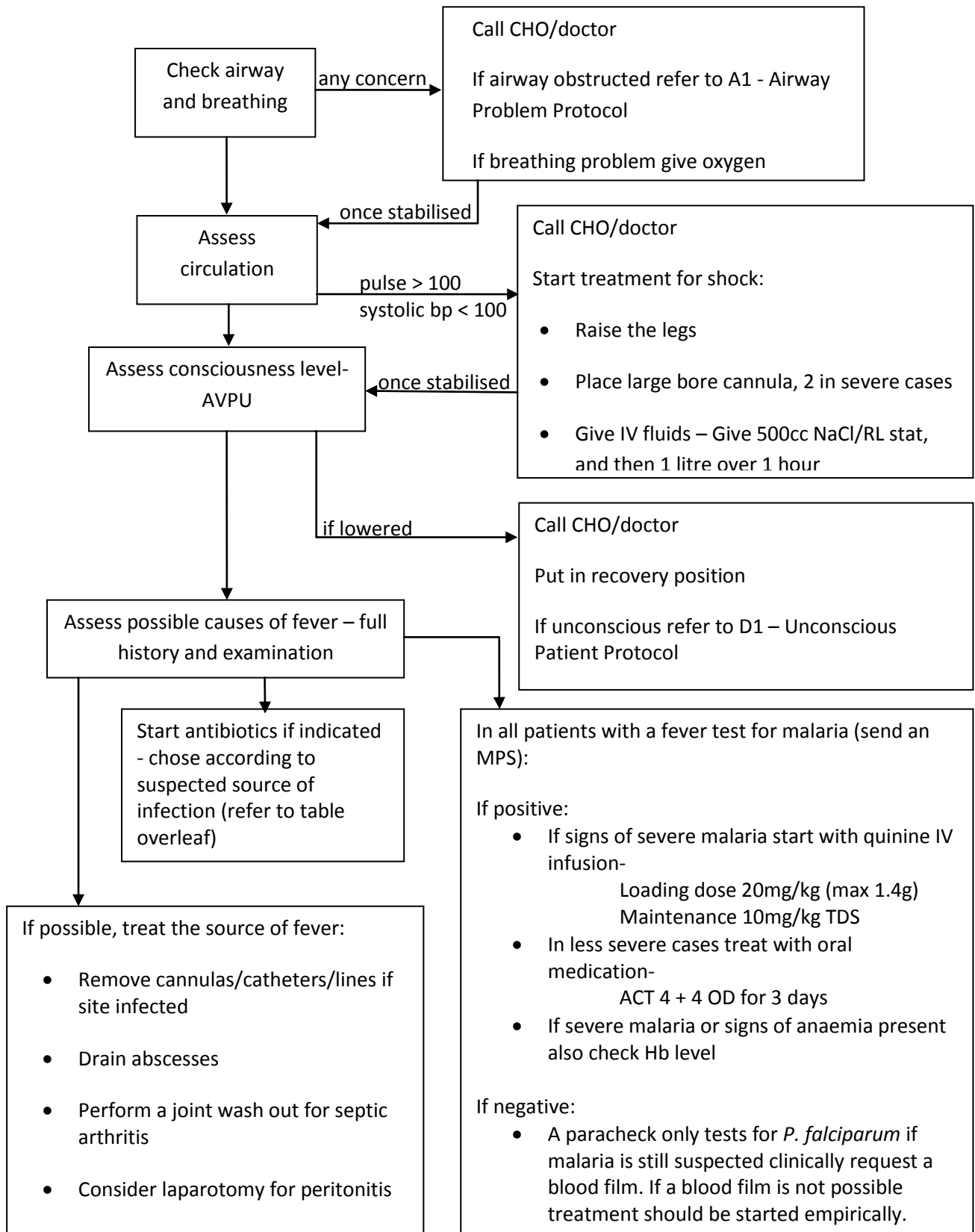
Meningitis	Headache, reduced consciousness level, neck stiffness, non blanching rash
Pneumonia	Breathlessness, cough, pleurisy
Pulmonary TB	Cough lasting $> 14$ days, haemoptysis
Endocarditis	New heart murmur, splinter haemorrhages
UTI/Pyelonephritis	Increased urinary frequency, dysuria, lumbar pain, ?urinary catheter (predisposes to infection)
Gastroenteritis	Vomiting, diarrhoea, abdominal pain
Peritonitis/intra abdominal	Abdominal exam – look for rigid abdomen, distension, rebound tenderness, guarding, absent bowel sounds
Cellulitis	Erythematous, hot skin. Particularly check any cannula sites
Abscesses	Localised, raised erythematous area from which pus can be aspirated
Septic Arthritis	Painful, swollen joint
Osteomyelitis	Bone pain, loss of limb function

Malaria should be tested for in all febrile patients.  
 Typhoid fever should also be considered particularly in the patient with fever, headache and no localising signs.

Think about if the patient could be immunocompromised and whether opportunistic infections should also be considered.

E1 – Fever Protocol cont...

4. MANAGEMENT:



E1 – Fever Protocol cont...

**Antibiotic Choice for Common Causes of Fever:**

Meningitis	Ceftriaxone 1g BD IV
Pneumonia	Ampicillin 1g QDS IV, Gentamycin 5mg/kg OD IV
UTI/Pyelonephritis	Co-trimoxazole 960mg TDS PO
Gastroenteritis	Most commonly viral! Stool sample should be sent to identify specific pathogen: <ul style="list-style-type: none"> <li>• Bacterial gastroenteritis - Co-trimoxazole 960mg TDS PO</li> <li>• Amoebic Dysentery – Metronidazole 800mg TDS for 10 days</li> <li>• Giardiasis – Metronidazole 400mg TDS for 5 days</li> </ul>
Peritonitis/intra abdominal	Ampicillin 1g QDS IV, Gentamycin 5mg/kg OD IV, Metronidazole 500mg TDS IV
Typhoid	Ciprofloxacin 400mg BD IV
Cellulitis	Cloxacillin 1g QDS IV
Abscesses	Cloxacillin 1g QDS IV
Septic Arthritis	Chloramphenicol 12.5mg/kg QDS IV



## Appendix 7: Start Up Phase Plan

### Emergency Admissions Unit

#### Start Up Phase Information

The Masanga Hospital Emergency Admissions Unit will open with a start up phase on **Monday the 3<sup>rd</sup> of December 2012**.

In the start up phase the unit will accept a specified group of patients. This is to allow time for the unit to become fully functional and for staff expertise to be developed.

##### Accepted Patients

In daytime hours (Monday to Friday 8am – 4pm) adult patients who are triaged as priority category 1 and 2 should be directed to the unit. This should be determined in line with the Emergency Admissions Unit Adult Triage Protocol. All staff expected to triage patients will have access to, and training on, use of this protocol.

During on call time and at weekends all new adult presentations (except maternity cases, see below) should attend the Emergency Admissions Unit.

##### Paediatric Patients

Paediatric patients will not currently be accepted as initial presentations by the unit. They should continue to present to either the OPD or directly to the paediatric ward as has been the current system.

In specific cases where it is felt by the CHO or doctor that a paediatric patient who they have seen could receive better care if they were treated in the unit, for example to utilise the 24 hour a day electric lighting or access the oxygen concentrator, then these cases can be transferred.

It is hoped that in the future that paediatric cases can also present directly to the unit. However, during the start up phase, it is felt that better care can be delivered using current systems.

##### Maternity Patients

All maternity and labour cases should continue to present to the maternity ward/labour room. They will not be accepted by the Emergency Admissions Unit.

##### Doctors of the World Patients

The Unit has been utilised since the 27<sup>th</sup> of October in accommodating surgical patients from the Doctors of the World Plastic and Reconstructive Surgery Mission. There are 4 of these patients remaining. These 4 patients will continue to be housed in the Emergency Unit until the point of their discharge, unless circumstances occur that it is necessary for them to be moved to other wards.

The opening of the Emergency Admissions Unit is a really positive development for Masanga Hospital. It will allow us provide better care for the whole community.

The start up phase will be challenging for staff throughout the hospital as we all get used to a changing system. We really appreciate the cooperation and help from all members of staff during this phase particularly in advising and redirecting patients as necessary. We hope all staff will support the new unit.