

**Emergency Department**  
**Antrim Hospital**  
**Doctor's Handbook**



**August 2015**

## PREFACE

Message from the Emergency Department Consultants about this book.....

As we bear overall responsibility for the treatment that patients receive throughout their time in the Emergency Department, we want to make sure that you know how to provide the best care possible. We revise this handbook once a year and distribute copies to all emergency department medical staff in Antrim Hospital.\* We expect all clinical staff to read, learn and follow the guidance in this book at all times. We will circulate written policy updates throughout the year and these should be noted in the blank table supplied at the end of the book for this purpose.

This will be a very valuable resource for you irrespective of your previous experience because it is tailored to this department. Advice is also available at all times by speaking to the Emergency Department Consultant.

The handbook is divided into the following sections:

General Information Section – Blue Pages

Adult Clinical Section – White Pages

Paediatric Section - Yellow Pages

Major Incident Section – Green Pages

**Emergency Treatment – Pink Pages**

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\*Doctors working in other Emergency Departments may find our Handbook useful, particularly if working within the Northern Area Trust. However the Emergency Department Consultants assume no responsibility for the contents of this book apart from its application in the Antrim Hospital setting. Many protocols in this book definitely do not apply elsewhere.

## **SECTION ONE – GENERAL INFORMATION**

The General Information Section describes how the Emergency Department service at Antrim works and how doctors are expected to work within the Emergency Department team.

## GETTING HELP

### 6000: CARDIAC ARREST:

- ADULT or
- PAEDIATRIC
- OBSTETRIC

### 6666: FAST BLEEP

- Stroke lysis
- Trauma team call (indicate if paediatric team or obstetric team also needed)
- Anaesthetist / airway team
- Obs and gynae (collapsed pregnant lady or an imminent delivery)
- Paediatric team (if critical illness in child)

**On call bleeps: - contact the appropriate F2/CT/ST using on call bleep (daily updated sheet at all staff bases) for all critical patients. This is also the number to bleep for admissions so clearly state if you need**

### Contacting the Emergency Department Consultants

There is a consultant Emergency Physician in Charge ("EPIC"). The EPIC carries DECT phone **1286** and is available on the shop floor Monday to Friday 8am to 10pm, Sat. & Sunday 9am to 1pm. If doctors require advise they are asked to discuss with middle grade Emergency Department doctor first. If this is not possible then you can discuss with the EPIC. Out of hours the middle grade doctor can contact the Consultant on call via Antrim Switchboard (although contact numbers are also available in the Emergency Department.) If after trying the phone, mobile and bleep no answer has been received you must contact a different ED consultant. You **MUST NEVER** leave messages on an answer machine when trying to contact the consultant. These are the situations in which the Emergency Department Consultant on call *must* be contacted urgently

- Major Incidents (including alerts)
- Multiple Casualty incidents
- Problems with the resuscitation of any seriously ill patient
- Serious violent incidents
- Problems with Child Protection issues
- *And any other situation that seriously compromises patient care!*

## ABOUT THE EMERGENCY DEPARTMENT

- *“Senior help and advice is always available.”*

The Emergency Department at Antrim Hospital treats just over 75,000 new patients each year, i.e. it is a medium-sized department in UK terms. The hospital provides a wide range of inpatient services including medicine, cardiology, surgery, paediatrics, obstetrics & gynaecology, ENT and intensive care. As well as this there are outpatient-only services that include fractures, orthopaedics, ophthalmology, maxillofacial surgery and plastics. There are resident F1, and resident F2s in medicine, surgery, obstetrics, paediatrics and anaesthetics. A liaison psychiatry service is provided by the neighbouring Holywell hospital.

The Emergency Department forms a vital link between the community and the hospital –in fact it could be described as the hospital’s “shop window”. The main purpose of the Emergency Department service is to treat major and minor trauma and various medical and surgical emergencies. As well as fulfilling this main role, we can help people to gain access to a wide range of services in primary care (general practice), community care and hospital outpatient departments. Our catchment area extends from the northern outskirts of Belfast, to towns like Antrim, Magherafelt, Ballymena and Larne. We also serve a large rural population and the villages along the Antrim Coast. The result is endless variety! We have to cope with classical ‘inner city’ patients including the socially deprived. This will include drunk and aggressive patients at times as well as a large number of patients who probably should have gone to their general practitioner but found the hospital more convenient! We also see the classical rural patient who only seeks medical attention as a last resort; often with florid pathology.

This is a very challenging environment in which to practice medicine but it is an excellent place to learn. There is a good mixture of minor and major cases in medicine, paediatrics, surgery, general practice, psychiatry etc. and an opportunity to follow up the patients who you have seen.

The Emergency Department medical team has eight consultants, two associate specialist, two staff grades, four ST4+ and twelve doctors in Foundation / Core training.... *SENIOR HELP AND ADVICE IS ALWAYS AVAILABLE.*

The department has six senior nursing sisters (main department & observation ward), over 65 nurses and a plaster technician. The senior nursing staff have extensive experience as well as a knowledge of how things are usually done in the hospital. This will be particularly helpful for doctors who are new to the department. There is always a ‘Triage Nurse’ on duty. He/she sees all patients

within fifteen minutes of arrival and prioritises them according to medical need. (the Triage Scale is described later in this book). Many of the nurses have extended skills such as cannulation, venepuncture and suturing. There are Nurse Practitioners who independently treat patients with a range of minor conditions. A nurse practitioner is on duty from 9am - 9pm or later every day.

## THE EMERGENCY DEPARTMENT DOCTOR'S ROTA

- *“Leave is on a first-come-first-served basis”*
  - *“Changes must be marked clearly on the notice board copy of the rota”*
- Breaks are rostered into your shift, ensure that you take them.*

### **1) Doctors in training**

Emergency Department F2s and STs work a full shift system involving a basic 45 hour week on average. Regular Emergency Department shifts last for nine or ten hours – i.e. eight to nine hours of work with 30 mins break every four hours or so. Emergency work permitting, STs will take a 30 minute break in the Emergency Department rest room (NOT outside the department) after every four hours of duty. At the end of their shift, doctors are expected to stay on duty until they have sorted out or handed over all their patients as well as helping during extra busy spells.

**Annual Leave:** Annual leave and days in lieu of stat days worked is built into the rota. If swaps are required please arrange this amongst yourselves.

**Study Leave:** study leave will be granted as per contract and service demands. Six weeks notice must be given for all F2/GP study days. All other study leave / exam requires six weeks notice and will be granted at the discretion of you ED Educational or Clinical Supervisor.

### **2) Middle Grade Doctors**

The middle grade rota is produced by Dr Jenkins' secretary according to a rotating template. Copies are available from her. Only one of the middle grade doctors can be on leave at once. In general, leave must start on a Monday and finish on a Sunday – any deviation from this requires specific consultant permission. Leave is booked with Dr Jenkins.

# TRAINING IN THE EMERGENCY DEPARTMENT

## 1. Before you start

It is expected that you will have completed the mandatory Trust and Right Patient, Right Blood haemovigilance training.

[www.spottingthesickchild.com](http://www.spottingthesickchild.com) is a valuable e-learning resource to help healthcare professionals to recognise children with serious illness. Any trainee that cannot demonstrate competencies in managing children with serious illness i.e. do not hold a valid APLS/EPLS certificate must complete this e-learning within two weeks of starting your ED placement.

## 2. Induction

Induction is mandatory. The aim of induction is to introduce to the style of working expected in the ED (which is very different from any other department within the hospital) and to ensure safe and efficient care of patients. Homework cases will be issued and should be completed prior to the relevant teaching session.

## 3. Teaching

**F2s' and ST1-2s'** contracted weekly duties include a compulsory protected teaching & audit session from 9am to 11.30am every Thursday. Full attendance as per rota is mandatory (non-attendance will result in allocation of compensatory extra duties and will also result in unsatisfactory appraisal reports and references). You **MUST** sign the attendance sheet every time as this is the basis for your certificate of training attendance when you leave. The teaching begins in the Observation Ward where you should assess a patient ready to present on the teaching ward round. This is then followed by a formal teaching session in the ED seminar room.

**ST3** if paediatric competencies are required then secondment paediatric clinics in either Mid-Ulster or Antrim Area Hospital will be arranged to facilitate this. It is expected that you will also participate in the weekly journal club and bimonthly morbidity and mortality meetings.

**ST4+** training is co-ordinated through NIMDTA and full attendance is expected. It is expected that you will also participate in the weekly journal club and bimonthly morbidity and mortality meetings. ST4+ doctors should use this opportunity to develop their own teaching skills by being involved in junior doctor teaching.

### **3. Supervision Meetings / E-portfolio**

Doctors in training are expected to arrange their initial interview with their ED Educational or Clinical Supervisor within two weeks of starting their ED placement. This can be arranged through the Consultant's secretary. Review interviews at mid point and end of placement are arranged in the same way.

It is your responsibility to keep a contemporaneous e-portfolio and log book in accordance with your College's recommendations. Many opportunities will present for completion of Work Based Assessments in the ED.

### **4. Audit**

All doctors in training will be expected to participate in and present at least one full audit cycle during their ED placement. We participate in the CEM audits (which change annually) and you may be allocated to one of these teams though you are free to choose your own audit topic.

## UNPLANNED LEAVE

### 1. Sick Leave

If you are sick you must inform the EPIC by phone (ext. 1286) and email Tanya Greer in medical personnel, ([tanya.greer@northerntrust.hscni.net](mailto:tanya.greer@northerntrust.hscni.net)) to inform them at least one day before the start of your shift or, in exceptional circumstances, within one hour of the time you were due to go on duty. *Failure to do this would constitute a serious breach of your professional responsibility.*

You must provide the following information:

- Your shift
- the reason for your absence;
- how long you are likely to be off;
- what action has been taken by you in respect of your illness e.g. doctor's appointment

In some circumstances you may not wish to discuss your reason for absence with your manager. If this is the case, you will be referred immediately to Occupational Health, to facilitate the management of your absence.

A return to work interview should be completed by your Education / Clinical Supervisor or the EPIC on the day your return. This information will be held by the directorate office.

Employees who become unfit for work during a period of annual leave must notify their manager on the first day of sickness absence, or as soon as possible, in accordance with this protocol and not wait until they return to work. Certificates should be provided as above. If these conditions are complied with, the annual leave will be converted into sick leave and the annual leave credited back to the employee. Otherwise this will result in the loss of annual leave. Employees will not be entitled to an additional day off if sick on a Public Holiday.

**Prospective cover (up to 72 hours):** In line with NHS terms and conditions, the other doctors covering your part of the rota will be required to cover all sick leave unless long term sickness is involved. In practice, this will involve longer shifts for those already on duty and extra nights for those on night duty if you were due to do the nights. Standard remuneration is added for these extra shifts but they cannot be paid back – it is our duty to support the sick colleagues on our rota in the short term.

## **Sick Leave in Previous Employment**

It is your professional duty to disclose any periods of sick leave in the proceeding twelve months prior to this placement. This should be disclosed at your initial supervision interview.

### **A word about infectious diseases...**

We have high medical sickness rates due to gastroenteritis, presumably contracted from patients most of the time. Reduce your risk of this by adhering to hospital infection control procedures – hand washing works! Wear scrubs or hospital-only clothes to reduce the risk to your family. Don't eat or drink in clinical areas even on night duty. Try to stay fit during your time in EM to keep your immune system working well despite the disruption of shift work.

### **Referral to Occupational Health**

Sick leave rates, especially casual leave, are closely monitored and almost always are disclosed on references. Doctors will be referred to Occupational Health if three or more periods of sick leave within twelve months employment as per the Northern Trust Managing Attendance Policy and Procedure Policy 2011. Immediate referral to occupational health may be considered in other circumstances such as injury at work, stress, period of illness anticipated to last greater than four weeks.

## **2. Carer's Leave / Compassionate Leave**

Special leave such as carer's leave or compassionate leave may be available to you if you have an issue with your private life, child care concerns or bereavement. This is usually at the discretion of your Educational / Clinical Supervisor.

## **3. Maternity / Paternity Leave**

This is as per the terms and conditions of your contract.

## WORKING IN THE EMERGENCY DEPARTMENT

- *“It is essential that you always look like a doctor”*
- *“Treat patients and their relatives in the way that you would like to be treated in the same situation”*
- *“If you are having difficulty with the treatment of a seriously ill patient get help immediately.”*

In order to become a good ED doctor you need to develop the ability to deal with patients very rapidly and to never appear to rush them, while making sure that you make the right decisions about their management. This is, of course, virtually impossible! If you don't learn to work quickly when there are a large number of patients in the department, you may rapidly become overwhelmed by the queues waiting for your attention. At the same time, it is important that you are tolerant with your patients and that you always appear to have time for them - even when you don't.

Emergency medicine is very challenging. Many of your patients will be so ill that you will have to start resuscitative treatment before you have any idea what is wrong with them. Others will have symptoms which sound very serious but which are due to relatively harmless conditions. One of the best ways of saving time is to work on your clinical skills so that you can make reasonably accurate diagnoses without ordering unnecessary blood tests and x-rays. The CLINICAL section of this book will be invaluable. There is more information about how to approach emergency medicine problems and about common diagnostic pitfalls later in this section. Practical sessions on resuscitation during the Induction Course should give you the confidence required to commence resuscitation in every situation. *If you are having difficulty with the treatment of a seriously ill patient get help immediately.*

- *It is essential that you always look like a doctor* - this means dressing professionally -hospital “scrubs” are preferred. Introduce yourself to every patient and their relatives as well as wearing your identity badge. If you involve junior or senior colleagues in a patient's care, introduce them as well.
- *Treat patients and their relatives in the way that you would like to be treated in the same situation*- patients appreciate this more than anything else. Remember that you are going to make mistakes - your patients will usually forgive a great deal provided you have treated them considerately.
- Be careful about people who are ‘just visiting’ the Emergency Department. Please do not bring unauthorised visitors into an area where patients are being treated. The medical students in the department are your responsibility and remember that any patient is entitled to refuse to be seen by students.
- Students must never *treat* children (e.g. by suturing, taking blood etc)

- Doctors who are not part of the Emergency department’s staff cannot come and work here without the Emergency Department consultants’ permission.
- NO doctor in the hospital should use the Emergency Department to self-treat or self-medicate except for minor ailments

**1. Communication and patient tracking**

In the Emergency Department, relatively large numbers of patients flow through a sequence of assessment and treatment areas that are physically separated from each other. Staff in each area will be constantly receiving and handing over patients so effective communication between areas is essential. The *electronic tracking system* ‘Symphony’ is central to the administration of patient flow through the Emergency Department. The ‘Symphony’ system enables an appropriate member of reception, nursing or medical staff to mark each stage of the patient’s journey on an electronic tracking system as each element of registration, assessment or treatment is completed. The tracking data must be entered accurately and in real-time by staff 24 hours each day – it is confidential and should not be viewed by unauthorised personnel. There is also a patient tracker from 10am to 10pm every day to assist with this.

Please remain professional during all communications with other healthcare professionals. Handover of patients should be made using the SBAR tool as detailed below. The handover should be recorded on the ED flimsy and on Symphony including name, grade and contact details.



**SBAR Reporting**

Attention all team members

For good communication about patients between all health professionals, use the SBAR tool before calling

*Safer Patient Initiative*

<b>S</b>	<b>situation</b> <i>What is going on now?</i>	<ul style="list-style-type: none"> <li>▪ State your name and Ward / Department</li> <li>▪ I am calling about patient's name</li> <li>▪ The reason I am calling is .....</li> <li>▪ Observations are</li> </ul>
<b>B</b>	<b>ackground</b> <i>What has happened?</i>	<ul style="list-style-type: none"> <li>▪ State the admission diagnosis and date of admission</li> <li>▪ Relevant medical history</li> <li>▪ A brief summary of treatment</li> </ul>
<b>A</b>	<b>ssessment</b> <i>What you found / think is going on</i>	<ul style="list-style-type: none"> <li>▪ State your assessment of the patient</li> <li>▪ Have appropriate documents available, e.g. EWS, nursing and medical records, resus status, allergies etc</li> </ul>
<b>R</b>	<b>ecommendation</b> <i>What <u>you</u> want to happen</i>	<ul style="list-style-type: none"> <li>▪ I would like (state what you would like to see done)</li> <li>▪ Determine timescale, e.g. NOW!</li> <li>▪ Is there anything I should do?</li> <li>▪ Other referrals? e.g. Acute Care Team</li> </ul>

**Do not forget to document the call**

*The Maintenance of computerised records is a clinical governance issue - persistent failure by an individual to fill out and update patients data, will be dealt with via the Trust's formal disciplinary procedure.*

GP letters are generated from the information in the DADT box on Symphony, they are the main form of communication from the ED to the GP. Ensure clear diagnosis, pertinent clinical findings and patient instructions are detailed. Also detail any follow-up arrangements, especially if GP involvement is required. Never phone the GP to complain, raise any issues with a senior ED doctor first.

## **2. Patient records (see Symphony section)**

Permanent patient records will be held electronically on the department's 'Symphony' system. After registration admin or clinical staff will print out a multidisciplinary paper flimsy at a print station. Patient labels can be generated at the same time. Once patients are discharged from the ED and after completed flimsies are scanned onto symphony, the paper version can be sent to a ward or fracture clinic etc (see Symphony Policy) The data e.g. your name, diagnosis and "DADT" generate an automatic GP letter so you MUST complete these EVERY time AS YOU GO ALONG – not optional and no-one else can do it for you.

The Freedom of Information Act 2000 gives patients the right to read their notes and frequently request copies from Medical Records.

## **3. Patient friends and relatives**

Relatives and friends should remain in the room with the patients, if a patient is not in a room they are limited to one relative due at the bed side. Relatives should be invited to wait in the waiting room when personal/intimate assessments and treatments are being conducted. Always gain verbal consent from the patient for relatives to remain during other assessments unless unable to consent, e.g. vulnerable patient, child. Relatives of gravely ill or distressed patients should be escorted to the Relatives Room by a senior nurse or doctor.

## **4. Night Time**

3 Doctors will work overnight one senior and 2 junior, any queries on patient care should be initially directed to the senior doctor who will advise on their management, if necessary they may need to contact the Consultant on call. When the department is busy "barn door" admissions should be speedily referred on to the speciality teams with the minimum of ED input provided

they are STABLE. Rules for access for relatives and members of the public apply all night. Doctors on night shift should not leave the department.

## **5. Access/Egress**

Access, egress and patient flow will be strictly controlled by door-locks and code access. Unauthorised personnel (public or staff) are not permitted in the department. All essential staff, required to visit the ED, will be circulated with information about how to access the department. The ED will not be used as a through way at any time.

## **6. Junior Doctor Working Model**

Junior and senior doctors work together in Antrim Hospital Emergency Department to provide the best care possible for our patients. There will be a daily allocation sheet of where you are supposed to work which also details the EPIC and consultant on call. In the past junior staff medical staff asked for help whenever they felt they needed it, senior input was often sought at the end of a patient journey. In this department we want to have input from the start of a patient's journey. If you have any concerns it is your duty to report to this consultant.

Consultants will conduct ward rounds at 8am and 10pm with the whole team. This is to aid in decision making and facilitate handover. It is recognised as good practice by our College.

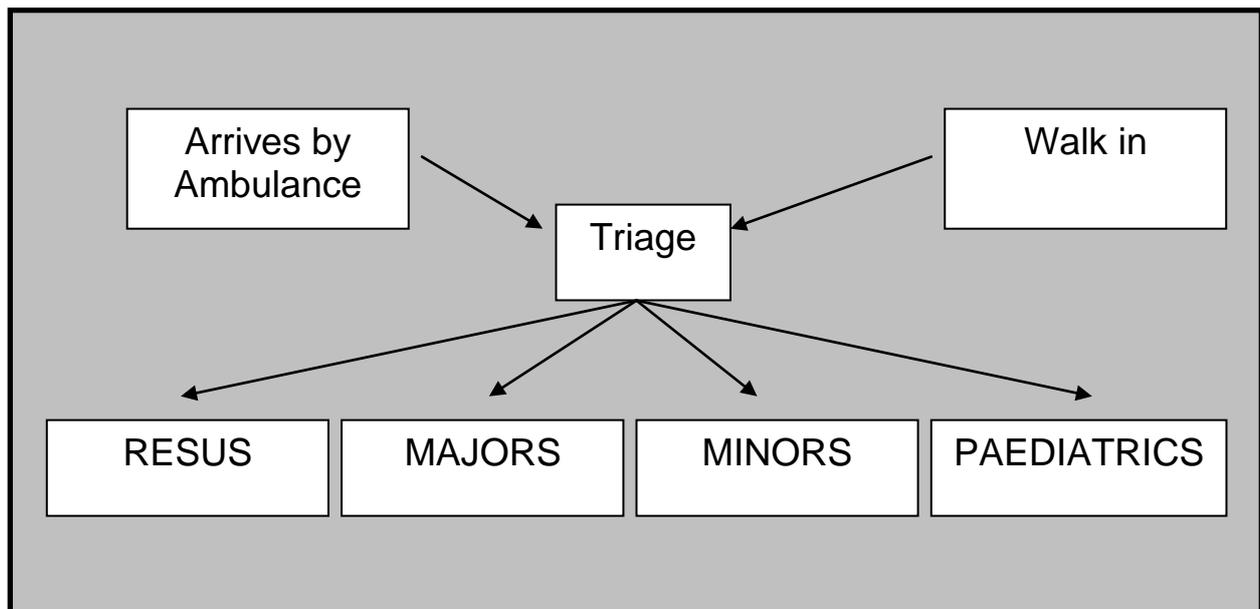
The ED is an excellent training area for junior doctors. Our working pattern is not supposed to stop you from thinking or working. This is an aid so you can see many patients rapidly and safely and to teach you how to make the right decisions. We want you to use the right tests for the right patients. There will be a senior doctor working beside you 24/7. We expect everyone to work together in this team-working model.

## **7. Evidence Base Medicine**

We practice EBM in this department where possible. This is to ensure safe, effective and efficient management of patients. Highlighted within the manual are most of the ED treatment pathways. These are evidence based and / or best practice. Other sources of EBM or Best Practice include the Trust Policy library on the intranet and recognised clinical guidelines e.g. GAIN and NICE. We will endeavour to keep you informed of clinical updates but it is your professional obligation to ensure your clinical knowledge is up-to-date.

## THE PATIENT'S JOURNEY

- *Triage means rapidly assessing patients so that the critically ill receive prompt treatment*
- *Triage and streaming are a dynamic process and they are the responsibility of doctors as well as nurses.*



### 1. Patient Streaming

Each patient's visit to the ED is a journey through a series of assessment/treatment locations (rather like the series of windows you stop at when you go to the Drive-Thru at McDonalds!). Each stream has a dedicated treatment area. The purpose of streaming is to enable patients to receive treatment and to "flow through" the system as smoothly as possible. The doctor/nurse teams in each location must keep up with patient arrival loads in their area or the whole department will seize up.

#### THE STREAMS ARE:

1. RESUSCITATION (Incorporating Adult and Children's Resuscitation)
2. ADULT MAJORS
3. PAEDIATRICS
4. MINORS

Allocation to the streaming system operates as follows:-

- All non-walking patients (i.e., mainly ambulance stretcher patients) enter via the ambulance door to be received by the ambulance triage

nurse who takes handover from the ambulance crew and carried out a rapid triage.

- Assessment in Resuscitation is for patients who have been phoned in by NIAS as a “Standby” or have been triaged as a Red or Orange category. This is a rapid assessment of the patient so that tests can be started, pain can be relieved and the seriously ill stabilised. A working plan should be made for the patient. This may include the use of point of care testing, sending specimens to the lab, ECG recording. The relevant specialties should be involved early for the seriously ill/injured/MI or Stroke. If the patient is obviously requiring admission then fill out the whole ED record quickly and arrange admission. Even though care is rapid in resuscitation you must carefully document treatment and complete your computer work as you go along.
- All walk-in patients report to Reception to register via the public emergency department entrance. The registration details entered by receptionists include the type of complaint that the patient is presenting with – e.g. “abdominal pain”, “ankle injury”. These patients are all triaged by the triage nurse and streamed accordingly.

## 2. Triage

In practice, the main purpose of *triage* is to prioritise patients according to acuity.

- i. After a brief assessment, the triage nurse direct appropriate patients back to the waiting room to join the queue for minor treatment.
- ii. If a patient of any age is *acutely unwell* the triage nurse escorts him/her into majors or resuscitation area and notifies staff there.
- iii. *Stable paediatric patients* (16 and under) excluding those with minor injury, are directed through to the Paediatric area.
- iv. *Stable adult patients* with non-minor conditions undergo basic observations e.g., vital sign measurement, urinalysis and the “WEAD+” before being directed to the Waiting Room to await an assessment cubicle in majors.

Along with streaming, the triage/streaming nurse use the Manchester Triage scale. This is shown below. This allows the nurse to direct you to the most seriously unwell patient first as opposed to first come first seen.

- Red and orange category patients should be seen immediately.
- Yellow within one hour.
- Green within 2 hours.
- Blue within 4 hours.

Ideally, all patients should be seen in a timely fashion.

UK national triage scale		
1	Immediate resuscitation	Patient in need of immediate treatment for preservation of life
2	Very urgent	Seriously ill or injured patients whose lives are not in immediate danger
3	Urgent	Patients with serious problems, but apparently stable condition
4	Standard	Standard cases without immediate danger or distress
5	Non-urgent	Patients whose conditions are not true accidents or emergencies

### **3. Ongoing care of Major Cases.**

- *Patients should be assessed in order of acuity then arrival time*

*Adult Majors:* Following their initial assessment in Majors, the vast majority of patients will require to be reassessed with results of investigations ordered. These patients may have been moved to the EDDA (annex off Observation Ward) or x-ray sub-wait (all should be tracked appropriately on Symphony) and should be reassessment there. If following the initial assessment there is a clear indication for admission then the patient should be admitted under the appropriate inpatient team at this time. (See admissions policy section)

Ambulant patients should be asked to walk to x-ray or waiting area. For non-ambulant patients, wheelchairs should be used if possible.

At time of reassessment a decision should be made regarding admission, community treatment or discharge. Doctors in training grades should regularly consult their senior colleagues about admission / discharge decisions until they become familiar with this department and document that this is done.

*Children up to 16 years:* Unless seriously ill or less than 90 days old, children will be directed to the paediatric area accompanied by their parents. The patients will undergo basic observation and assessment by the nurse stationed in the area and then they will be assessed by a member of the medical team as allocated on the daily allocation sheet. (See admissions policy section).

#### **4. Senior Sign off**

Groups such as Under 1 with a raised temp, >18yr olds with non-traumatic chest pain and Unplanned re-attenders and all admissions should be discussed with the most senior doctor (ST4+) prior to discharge. The ST4+ should enter their details under “signoff” on the Symphony system. A note should be made that makes reference to the consultation.

#### **5. Patients requiring admission.**

- *All admissions must be vetted by a senior ED doctor (ST4+) and the sign off box completed on Symphony*
- *Hand over the patient using the SBAR tool already described.*

*Medicine & Surgery:* The hospital has a *direct admissions* policy for adult medical, surgical and cardiology patients who have been assessed in the Emergency Department. Decision rules about admission are given in the CLINICAL section of this book. If the ED doctor decides to admit, the patient flow co-ordinator is notified via the Symphony screen and the doctor notifies the appropriate SHO in the relevant speciality should be contacted via the bleep system and a handover given.

*The Observation Ward:* The Observation Ward has a set number of conditions with a single focussed goal on admission; this is not “to make them better”.

The Protocols must be adhered to and are available in folders in Majors and Observation Ward.

Any deviation from these e.g. Consultant protocol over-ride must be discussed with a named consultant and documented on the proforma.

*Other Specialty Wards:* Admissions to paediatrics, gynaecology, ENT are via the take-in SHO or Middle Grade doctor in the relevant specialty. Where possible he/she will choose to accept the admission on the basis of telephone information. If a doctor in any of the above specialties wishes to “vet” the admission by examining the patient, DHSS rules stipulate that this must be completed within two hours of the patient’s registration. The visiting doctor MUST inform the ED doctor about the outcome of his/her assessment so that the admission/discharge process including computer screens can be completed (Non-ED doctors must never discharge patients!)

*Patients with Mental Health Problems.* Patients should be assessed using the Mental Health Triage Tool which will facilitate a joint ED / mental health journey for the patient. Medical needs should be addressed where necessary by ED medical staff. Mental health assessment should be carried out once

patient is fit for assessment (medical needs may still be outstanding in stable patients)

## **6. Care of Minors**

- *Patients should be seen in order of acuity and then time of arrival*

The **minors** area incorporates 6 cubicles, ENT and eye examination facilities and general examination facilities. There is a seated sub-waiting area near reception. The ENP/doctor team in minors will see patients according to time of arrival (although patients who cannot be treated by nurse practitioners may occasionally be overtaken by those who can). Patients will be called to the minors area and put in a cubicle when it becomes available. Patients returning from x-ray will be directed to return to the small seating area to await reassessment. Fracture reduction without sedation should be carried out in the Plaster Room. Procedural sedation should be carried out only in Resus.

## “THE FOUR HOUR TARGET”

- *Patients should have their DADT screen completed within 3h 00m of registration*

*Each doctor and ENP's individual performance will be audited continuously via the Symphony computer system. Doctors must learn to treat patients SAFELY, EFFECTIVELY and PROMPTLY.*

Delays in the Emergency Department are usually related to inefficient use of resources - especially the doctor's time and the treatment cubicles- rather than being simply due to the number of patients attending.

### **Do's and Don'ts that prevent long waiting times**

- **DON'T get too engrossed** with one patient - make rapid decisions or if you don't know what to do ask for help. You don't have to make a complete diagnosis to plan an Emergency Department patient's management – learn to make the relevant decision as quickly as possible and treat/refer accordingly.
- **DO ensure that patients** waiting for admission, x-rays etc. are moved out of assessment / treatment cubicles to allow new patients to be brought in - keep things moving! If there is a major problem with space, the nurse-in-charge can implement our escalation plan.
- **DO stay with the patient stream** that you have been given on the daily allocation sheet, unless specifically asked to change by the EPIC.
- **DON'T spend ages on the phone trying to contact other doctors/ arrange transfers.** Ask the patient tracker or ward clerk to continue to try to contact the person you are looking for. At times there will be one of the reception staff manning the phones.
- **DON'T request unnecessary** x-rays, blood tests etc.; they cause long delays. (See Defensive Medicine)
- **DON'T hang around in *Resuscitation*** when you are no longer actively involved in treatment there (this is a common cause of extra long waiting times.).
- **DO be NICE!!** People who have been waiting for longer than 90 minutes can't help getting frustrated and irritable. They appreciate an apology or at least some empathy. They may be anxious, in pain or have young families to contend with. Some acknowledgement of this makes it much easier for you to deal with them - disgruntled patients become a nuisance to everyone and its amazing how easy it can be to pacify them.

- **DON'T go off duty** if there are a large number of patients waiting to be seen or if the waiting time is long (this is a professional obligation for all doctors and junior doctors' pay-banding calculation allows for this).
- **DON'T forget that staff are important too.** Make sure you take a break now and again no matter how busy you are!" Breaks are rostered into your shift; ensure that you take them in full and on time.

## THE EMERGENCY DEPARTMENT CONSULTATION

Sir William Osler the famous Canadian physician once said "there is more to treating the patient than treating his disease". This is certainly true in Emergency Department! In most cases, an *accurate* and *focused* history is the key to diagnosis and management of Emergency Department patients. A "directed physical examination" and the minimum of investigations follow. The clinical section will help you to devise effective assessment routines for common problems. This section gives guidance about how to carry out a time-efficient consultation.

### The Emergency Department Consultation

- Why was this patient referred?
- Risk Factors- 'WEAD+'
- Focused history
- Directed Physical Examination
- Directed Investigations
- Final placement

### 1. Why was this patient referred?

#### a) Information from the "Source of referral"

Always start by working out the main purpose for the patient's attendance. If you can do this (not always as easy as it sounds), you will find it much easier to make decisions about management.

The Source of Referral prints out on the top right hand corner of the flimsy

- GP or GL – GP referral
- EM – 999 or Doctor's Urgent Ambulance Call
- SR or PG – self or parent referred

Having established the source of referral you can use this information to find out more:

- **GP or GL:** Scrutinise the GP referral letter. If the patient's GP sent him what did he/she want us to do? Was the letter definitely addressed to Emergency Department (written alongside

“Department” on the referral sheet) or has the GP asked for direct access to physiotherapy, x-ray or outpatients? Is the patient suitable for AMAA?

- Was the letter written today? Is admission requested or does the GP simply want an ECG or an x-ray. *In general we do whatever the GP requests - they know their patients better than we do.*
- **EM:** Find out who sent for the ambulance and why. There are two types of ambulance call – ‘999’ or ‘Doctor’s Urgent’ (the latter follows a GP call to the Emergency Admissions Co-ordination Centre). Try to speak to the ambulance crew, they know lots of information about the patient’s home, who was there etc. If the crew have left, ask the nurse who accepted the patient from them. *People usually dial 999 in some sort of crisis, but it isn’t always a medical crisis.*
- **SR:** You need to find out (tactfully!), why the patient has decided to come to Emergency Department at this moment. Have they been to their GP? If it is a chronic problem, what has changed to persuade them that they should get help now? If they are re-attending Emergency Department, are they not happy with treatment received earlier? If the complaint seems trivial, what are they worried about? What is the situation they can’t cope with? These are questions that cannot be approached bluntly. *Contrary to popular belief very few people come to Emergency Department for nothing, so never dismiss seemingly trivial complaints and never make them regret coming to our department.*

### b) Information from Next of Kin

Remember that relatives may have had an important role in initiating the attendance; for example, have the relatives concerns which the patient hasn’t passed on to you? Try to involve them as much as possible in a patient’s management and take their advice. It is essential to start your history with the relative or other carer if a patient is elderly and/or confused. If the patient comes from a private nursing home you can phone them and speak to the nurse in charge. *When relatives, especially parents of young children, are very concerned or believe that you are making a mistake they often become aggressive - don’t let this influence your judgement, they may be right!* It is important you listen to parents in particular if the child is very young, disabled or has learning difficulties. Be willing to change your mind or offer them a second opinion (there is more about this later in the section).

### c) Information from Previous Attendances or Admissions

The Emergency Department system will print out the words “Prev. episodes: ...” at the right hand side of the flimsy’s triage section if the patient has ever been to Emergency Department before. *Make sure you are check all old records for children under 16/vulnerable adults.* Information about previous episodes is essential - it might alert you to an otherwise unsuspected problem e.g. non-accidental injury, domestic violence, addiction, Munchausen’s syndrome etc. Ask the patient if they have ever attended any other department in the hospital before then ask the receptionists to get their old hospital notes if this is relevant. It is also possible through the labs system and radiology systems to obtain previous reports that can sometimes help.

NIECR is a valuable resource.

## **2. Record Risk Factors – “WEAD+”**

WEAD+ stands for Warfarin / Epilepsy / Asthma / Diabetes plus Pregnancy and Peptic ulcer disease. You rarely have time to take a lengthy previous medical history but you must record the ‘WEAD’ history on every patient, especially in minors, because these are high risk factors in practice especially when prescribing. E.g. warfarin is a risk factor for bleeding after head injury; diabetes: soft tissue infection, silent infarct; epilepsy: drug interactions; asthma: NSAIDs. This will have been filled out on the front of the ED Notes.

## **3. Focused History**

Your time is short. You are highly dependent on an accurate history if you are to make the correct diagnosis. Don't forget to listen to what your patient is saying – failing to do so is a very common source of error and complaints in the Emergency Department. When dealing with trauma, the mechanism of injury is crucial. Don't jump to conclusions – if you miss something important in the history, you will fail to carry out the correct examination and. Take careful note of the vital signs and any other comments recorded by nursing staff in their Triage note – a discrepancy between your opinion and the nurse's opinion should ring alarm bells.

The CLINICAL section gives guidance for history-taking in specific conditions, but don't forget what Dr Richard Asher, the prominent English Physician once said,

*“Listen to your patient, she is telling you what is wrong with her..”*

## **4. Directed Physical Examination**

- *“if you haven't carried out and documented the necessary examination you will have no defence against medical negligence claims”*

A concise and accurate directed physical examination separates the experienced from the inexperienced ED Doctor. When your history is complete you must carry out a careful but directed physical examination, concentrating on the *relevant* physical signs. You must ensure that your patient is adequately undressed for this examination – patients write official complaints if a doctor examines them through their clothes (yes...some

doctors are tempted to do this. You will see why when you start working in Minors!). You must document your examination findings carefully.

The CLINICAL section will provide you with important information about directed examination. It will help you to become a more effective and efficient ED doctor.

## **5. Directed Investigations (see defensive medicine)**

- *“Over-investigating patients is the largest waste of time and resources in the Emergency Department”*
- *Concentrate on your clinical skills of history-taking and examination.*

Good ED doctors keep investigations to a minimum - this is a difficult transition for doctors who are used to working in specialities like general medicine where good doctors often seem to order every test imaginable. You must weigh the benefits of ordering an investigation against its cost and the time it takes. Concentrate on your clinical skills of history-taking, examination and examination. Learn the role of investigations in common emergency conditions – more about this in the CLINICAL Section. Doing a battery of investigations if you don't know why will create a nightmare later when you have to interpret them – all results, normal or abnormal must be interpreted in a clinical context.

### **a) Blood tests**

The department has two point-of-care testing (POC) machines: a biochemistry analyser that can be used to measure Hb, U&E and pH, PO<sub>2</sub>, PCO<sub>2</sub> etc., an FBP machine. These are precious pieces of equipment – please leave them the way you found them. It is your responsibility to give the necessary details and sign for the blood tests you have performed.

You will be instructed in the use of the POC machines and given bar code access when you start to work in EMERGENCY DEPARTMENT but here are the five golden rules (currently under continuous audit!):

1. Record full Patient ID (name, DOB, EMERGENCY DEPARTMENT or unit number) on machine log sheet
2. Record User (your) ID or use your barcode to access the test
3. Write “POC” & any clinically important results on patient's flimsey(e.g. K+, glucose)
4. Any tests whose results exceed credibility range immediately **MUST BE REPEATED** (see guidelines on each machine). **THIS IS VERY IMPORTANT!**
5. **DO NOT** leave results lying around.

**Failure to do this will result in disciplinary action. You are responsible for looking at the blood results YOU have requested.**

*Never do unnecessary non-emergency bloods, they are the inpatient teams'F1s responsibility. The printed results will come to Emergency Department instead of the wards irrespective of what you write on the request form.*

If you request bloods it is your responsibility to ensure that you have checked the results and acted upon the result. This is known in law as the "Duty of Diligence".

NO ONE BUT YOU CHECKS THE RESULTS OF DISCHARGED PATIENTS  
– THINK BEFORE YOU REQUEST A TEST THAT TAKES DAYS TO RETURN –

"HOW WILL I FOLLOW UP THE RESULT??"

*NON-SPECIFIC "TOXICOLOGY SCREENS "must not be requested. Request specific toxicology tests only – research has established that alert patients almost never lie about what they have taken. Serum Paracetamol and aspirin should be tested in patients with unexplained coma.*

### **b) Radiological Imaging**

Imaging studies are requested through the e-referral system and the images are then accessed through NIPACS. Imaging should be order on clinical grounds and in accordance with IMER guidelines. CT, MRI and USS requests should be vetted by ED ST4+.

*The use of portable x-rays should be restricted to the critically ill only – they are less diagnostic than films taken in the x-ray department and this may result in delayed or missed diagnoses.*

**c) The following condition specific tests should have these tests done.**

<p><b>ABDOMINAL PAIN</b>                  FBP                  LFT                  CRP                  HCG +/- Erect CXR                  AXR</p>	<p>U&amp;E                  Amylase                  Urinalysis                  +/-</p>	<p><b>CHEST PAIN Cardiac sounding</b>                  U&amp;E                  FBP                  ECG 1                  CXR                  Troponin                  ECG 2</p>
<p><b>COLLAPSE ?SEIZURE</b>                  U&amp;E                  LFTs                  Ca                  Drug levels of antiepileptics                  Urine &amp; HCG</p>	<p>Glucose                  Mg                  FBP                  ECG                  CXR</p>	<p><b>GI BLEED</b>                  FBP                  Coag                  INR                  BM                  CXR                  U&amp;E                  LFT                  G&amp;H                  ECG</p>
<p><b>HEADACHE</b>                  a. Thunder Clap headache OR New abnormal findings = CT                  b. With none of the above BUT &gt;55 years of age = ESR</p>	<p><b>NON-SPECIFIC CHEST PAIN</b>                  ECG                  Chest x-ray</p>	
<p><b>PALPITATIONS</b>                  ECG</p>	<p><b>PV BLEEDING</b>                  Urine HCG (12-55)                  Serum HCG if unable to obtain urine sample</p>	
<p><b>RULE OUT PE</b>                  FBP                  CRP                  score U&amp;E                  D-dimer</p>	<p>ECG                  Wells                  +/-                  CXR</p>	<p><b>SOB</b>                  FBP                  CRP                  ABG if sats &lt;92                  ECG                  Peak Flow                  U&amp;E                  Sats                  urine                  CXR</p>
<p><b>STROKE/TIA</b>                  FBP                  BM                  Coag +/- INR</p>	<p>U&amp;E                  ECG</p>	<p><b>SYNCOPE</b>                  U&amp;E/Glucose                  FBP/CRP                  Elderly – Troponin                  CXR                  Lying/Standing BP                  ECG                  Urine</p>
<p><b>UNWELL ELDERLY</b>                  FBP                  Troponin                  LFT                  CXR                  Lying / standing BP</p>	<p>U&amp;E                  CRP                  ECG                  Urine</p>	<p><b>WARFARIN</b>                  INR</p>

## **6. Final Placement (Part 1): Discharging and Arranging Follow-up**

'Final Placement' or 'disposal' are the rather unfortunate terms used by Emergency Departments for what you decide to do with your patient after you have completed their management. Your decision *must* be recorded in writing by completing the final placement box of back of flimsy AND on SYMPHONY.

### **a) Discharge / referral Plan**

This is at least as important as your history and examination – equal care should be taken with devising and recording it.

When you are discharging a patient your written management plan should include:

- clinical management
- verbal +/- written advice (and who receives it)
- follow-up arrangements
- suggestions for action by GP\* (Please consider...)
- drugs (generic) dispensed or prescribed \*
- who is to care for the patient outside hospital\*

\* where appropriate.

Specific advice about the follow-up arrangements & advice necessary for patients with common conditions can be found in the CLINICAL section.

When you have made an initial diagnosis and management plan it is essential to explain the diagnosis and prognosis to the patient. For many of the common conditions we have a written advice sheet and the patient should receive one of these as well as a verbal explanation. You must learn the prognosis for common Emergency Department conditions especially soft tissue disorders so that you can advise patients correctly. We have tried to include all the relevant information in the CLINICAL SECTION.

Patients/carers should be advised to return to the department if there is any unexpected deterioration or if things do not improve as quickly as they should- but not for a "Check Up" irrespective of how they are. This advice is usually recorded by clicking the 'return promptly....' Option on the Symphony discharge menu. Specific advice given should be recorded.

## **b) Discharging Safely**

*Don't forget to check that your patient will receive adequate help after discharge.* Patients who are to be discharged from the Emergency Department should not be allowed to go home unless a responsible adult is available to care for them where necessary. Try to mobilise support from the family or friends for the person living alone. If the patient insists on going home alone follow hospital procedure for "contrary to advice" discharges. For the elderly or those with limb problems the gait assessment should be recorded on the flimsy.

## **c) Reviewing Patients at the Emergency Department**

*"The vast majority of patients can be trusted to know when they need to re-attend Emergency Department – you do not need to review patients routinely"*

DO NOT bring patients back for review at the Emergency Department except in the circumstances described below. If you aren't sure about a patient's diagnosis or management discuss with the senior doctor on the shop floor, if the management is still not clear leave the notes for discussion at the morning handover. Ensure that YOU have recorded the patient's current (preferably mobile) telephone number and tell them that you are going to ask for a consultant's opinion on their condition, x-ray etc.

You can refer patients directly to the following clinics based in the ED:

1. Emergency Review clinic Wednesday am:
  - All significant finger tip injuries
  - All significant hand ligament or tendon injuries NOT requiring urgent orthopaedic or plastics input
  - Traumatic joint effusions WITHOUT ANY FRACTURE, significant ligament tears
  - Limping children including ? Toddler's fracture
  - ? fracture in children (x-ray negative)
  - *Complicated* wounds, burns etc (excluding treatment room cases)
  - Clinical scaphoid injuries
2. Injury Review Clinic (when review is needed earlier than Wednesday clinic)
3. DVT Ambulatory Care Clinic (includes weekends)
4. Observation Ward Attender
  - Imaging. CTKUB, CTPA
  - Treatment e.g. enoxaparin education, IV antibiotics (consider hospital diversion team), warfarinisation

### **d) Outpatient Review of ED Patients**

The following are available direct access outpatient clinics:

Early Pregnancy Assessment Clinic – phone EPAC directly in hours, out of hours contact Gynae ward for appointment. If medical assessment needed contact Gynae SHO bleep 5666.  
 ENT for nasal fractures only – review in 5-7 days, make appointment at ED reception  
 Fracture clinic (Whiteabbey hospital) for all definite fractures not requiring urgent (within 1 week) orthopaedic intervention / review (discuss these patients with Ortho SHO in RVH)  
 Rapid Access Chest Pain Clinic – complete referral form and fax top number on form  
 Rapid Access Medical Clinic – complete referral form / clear indication on ED flimsy and book next day appointment though PAS by ED reception staff

### **e) Red Flag Referrals**

All patients with indicators for a REF FLAG referral not requiring admission should be referred by the ED doctor to the appropriate team. Liaise with the ED secretaries to type up a formal referral letter that can be tracked. This should not be delegated to the GP to ensure timely follow-up and reduce chance of loss to follow-up. Other non-urgent outpatient referrals should be delegated to the GP with clear instructions on the GP letter (DADT).

### **f) Discharge to GP Care**

*“ please consider..”*

When a patient is discharged from the Emergency Department/hospital, their GP is once again legally responsible for their care –they have been handed over. For this reason, Emergency Department doctors rarely refer patients directly to another consultant or clinic - their GP's will want to decide about this. You can make a recommendation selecting one of the “GP asked to consider” options on the drop-down menu. Advise patients that their GP will refer only if they think it is appropriate and that they should contact their surgery and arrange an appointment with him/her.

You should also ask patients to return to their GP for repeat BP checks, for review of soft tissue infections after you have prescribed antibiotics, and for reassessment of rashes, sore ears, paediatric or medical conditions etc. In general, patients who require dressings or removal of sutures should be referred to their Treatment Room. Write a concise and accurate discharge

letter (DADT box) detailing pertinent results and specific follow-up requirements.

### **g) Prescribing in the Emergency Department**

*“Generic prescribing please!”*

You have two options when a patient requires medication:

1. You can prescribe an ANTIBIOTIC or PAIN relief pack or make up seven days supply of other drugs (advice about the antibiotic and pain packs is included in the CLINICAL section).
2. In limited circumstances a hospital prescription may be required e.g. controlled drugs. This should be discussed first with senior ED doctor (with the exception of commencement of warfarin as per DVT pathway).
3. *Children's doses* are always different – they must be checked in the BNF every time.

*DO NOT OVERDOSE PATIENTS (esp. ELDERLY) ON STRONG ANALGESICS –CONSULT BNF*

## **6. Final Placement (Part 2): Assessing and Treating Patients Who May Require Admission**

### **a) Pre-admission assessment (N.B. The Modified AEP below)**

Patients who have attended for pre-admission assessment generally fall into one of three categories:

- *They require investigation by Emergency Department to rule out serious pathology*  
*(Examples include ?DVT, headache, abdominal pain, chest pain).*
- *They require emergency inpatient care*
- *They require improved social support, home therapy or nursing home care urgently*  
*(Examples include the elderly patient with a fracture, poor home circumstances, poor mobility).*

## **b) The Modified Appropriateness Evaluation Protocol**

This management tool assists in the decision making regarding appropriate admissions. There are occasions when a patient should be admitted despite a lack of indications on AEP – this is a Consultant case.

### **At least one of the following:**

1. Unstable angina OR ECG or cardiac marker evidence of acute ischaemia<sup>1</sup>
2. Will require monitoring of cardiac rhythm, blood pressure, pulse, temperature *or* respiration either continuously *or* two-hourly for more than 4 hours
3. Will require intravenous fluid or intravenous medication that cannot be administered in the community<sup>2</sup>
4. Will require any form of new artificial ventilation or supplemental oxygen<sup>3</sup>
5. Severe electrolyte/acid base abnormality<sup>4</sup>
6. Likely to require a procedure in theatre within 18 hours<sup>5</sup>
7. Acute loss of ability to move a limb or other body part within 48 hours of admission
8. Acute impairment or reduction of sight or hearing within 48 hours prior to admission
9. Recent acute internal bleeding(except haematuria unless requiring catheterisation)
10. Pulse rate <50 or > 140 per minute
11. Systolic BP <90 or>200, diastolic <60 or > 120 mmHg
12. Acute confusional state/ coma/ unresponsiveness<sup>6</sup>
13. Acute rupture of recent surgical wound
14. Consultant Protocol-override authorised by Dr\_\_\_\_\_

#### Notes:

1. Unstable Angina is defined as either crescendo angina, new onset angina within 5 days *or* angina at rest within 5 days where “angina” is taken to mean *typical* cardiac pain)
2. Contraindication to community iv therapy may be medical or due to unavailability of community services
3. Unless patient already on supplemental oxygen and no adjustment of dose needed
4. Check with experienced A&E doctor if unsure
5. This includes interventions such a fracture reduction in A&E procedure room, urgent endoscopies etc
6. This excludes simple inebriation unless CNS obs or monitoring required(see criterion two above)

Admission arrangements for psychiatric patients, ENT patients and those requiring intensive care are different. You need to ask the relevant doctors to assess the patient for you, you cannot admit directly yourself.

Remember, alternatives to admission include:

1. Direct access outpatient clinics e.g. RACPC, TIA clinic, RAMC
2. Hospital diversion team
3. GP referral to non-urgent outpatient clinic

Patients requiring admission should be handed over to the appropriate team using the SBAR tool (see below), DADT and bed request completed on Symphony and the final placement box on the ED flimsy completed. The named nurse for the patient should also be informed so they can complete the necessary paperwork and handover to the ward staff. It is also good practice to inform relatives.

### **c) Transferring to Another Hospital**

Some patients require transfer to other hospitals because they need specialist care not available on this site (e.g. head trauma, fractures).

- Clearly document receiving doctor with name and grade
- Clearly document any transfer instructions
- Stabilise and optimise patient condition as possible
- Legible transfer letter / copy of completed ED flimsy to accompany patient
- NICATS transfer for IUC patients
- Critical care neo-natal transfers telephone **07825147266 (co-ordinator) and 02890632499 / 02890633466 (PICU)**
- Critical care paediatric transfer for critically ill children up to their 14<sup>th</sup> birthday telephone **02890632499 / 02890633466 (PICU)**

### **d) Emergency Care in the Community**

THERE ARE SOME EXCELLENT SERVICES IN THE COMMUNITY—PLEASE USE THEM AS MUCH AS POSSIBLE.

There is a rapid access community team that includes nursing, physiotherapist and occupational therapists. This is only available in hours and can be accessed by **phoning 25635339**

The hospital social worker should be contacted if an emergency care package is required due to inter-current illness or injury or a change on social circumstances. Remember that the patient may be means-tested and may

have to pay for part of their care (the Social Worker will explain this to the patient but you should also be aware of it)

In addition there are a variety of Specialist Nurses who look after patients with long-term illness and help them avoid unnecessary hospital admission eg Diabetic Specialist Nurses, Respiratory Nurse specialists, Cardiac Function Nurses, Dementia Nurses etc. Your patient or their carer will often be able to give you the name and number of their Nurse Specialist – try to involve them as early as possible as their help is invaluable.

### **e) Hospital Diversion Team**

Hospital Diversion Team can be asked to give iv antibiotics at home for selected patients requiring iv therapy who are not ill enough to require hospitalisation. The HDT nurse should be contacted by phone before the patient leaves Emergency Department so that a firm arrangement can be made in advance of their discharge. The patient needs a drug kardex properly filled out, prescription written with drug and diluent (i.e. water or saline), HDT referral form (on symphony) and a copy of the patient's notes. These patients remain under the care of Emergency Department and in practice almost all are on antibiotics for severe or non-responding cellulitis or UTI in stable patients not requiring hospitalisation. A time should be arranged for re-assessment at the Emergency Department if you have particular concerns but often you can give the patient a supply of oral antibiotics to use after their iv's are completed (usually on Day Four or Five) and ask the HDT nurse to monitor progress. In certain circumstances other IV medication can be administrated (this is on a case by case basis) either in the home or in Whiteabbey/ Midulster Clinics.

Phone: Office 352552

### **f) "Running out of beds"**

- *"this Emergency Department does not close !"*

At times hospitals temporarily run out of beds but the Emergency Department can never close! The ambulance service will be asked not to bring patients requiring admission to us but this is only a request, ambulances are still entitled to come if necessary –never argue with ambulance personnel. Never discharge a patient needing admission because of bed shortages and never transfer patients who are unfit. The Emergency Department consultants can help you in the event of difficulties.

## EMERGENCY DEPARTMENT OBSERVATION WARD

- *There MUST be a single focused goal*
- *The goal should be achievable within 24 hours.*

The Emergency Department Observation Ward is a ten-bedded ward that is an integral part of the Emergency Department. The unit has a dedicated ward manager and nursing staff, while medical staffing is provided by the ED doctors on duty.

The purpose of the Observation Ward is to extend the time available for investigation and treatment of selected ED patients from 4 to 24 hours thereby reducing the emergency admission rate to the inpatient wards. Its ultimate goal is to improve the quality and effectiveness of care for patients.

### **a) Admission Criteria**

There are set criteria and proformas for admission to the Observation ward, these must be accurately completed and Kardex filled before admission to the ward. Any urgent treatment must be completed in the ED prior to admission to the ward. The admission must be vetted by ED ST4 or above.

Only patients aged fifteen or over may be admitted to the Observation Ward. A list of suitable conditions for Obs care is given later, however this is for guidance only and doctors must use their clinical judgement in every case while applying certain general principles:

The following is the current admission list:

1. Diagnostic
  - a. DVT
  - b. Low risk PE
  - c. Low risk chest pain
  - d. Ureteric colic
  - e. ? hip fracture (x-ray negative)
2. Observation and risk stratification
  - a. Head injury
  - b. Seizure (not status)
  - c. Self harm / suicidal ideation
  - d. Post procedural sedation
  - e. Alcohol intoxication requiring medical re-assessment once fit
  - f. Pneumothorax post aspiration
  - g. SVT post treatment
  - h. Anaphylaxis

3. Therapeutic
  - a. Self harm
  - b. Cellulitis
  - c. Tonsillitis
  - d. Awaiting defined procedural sedation procedure “in hours”
  - e. Pharmacy education for enoxaparin administration, warfarinisation or novel oral anticoagulants.

This list is not exhaustive; it is for guidance only. Not all patients with the conditions above will be suitable for Observation Ward care – general admission / exclusion criteria apply.

### **b) Specific Exclusion Criteria**

Patients with the following conditions must not be admitted to the Observation Ward without the ED consultant’s permission:

- Low back pain (unless due to acute extrinsic injury)
- Post-Chemotherapy complications
- Patients with complex or multiple medical needs are generally not suitable for Observation ward

### **c) Admission Procedure**

When the ED doctor has decided to admit a patient to the Observation Ward he/she should:

- Tell the patient and relatives or carers that he or she will be kept in the Observation Ward for a period of observation/treatment and that discharge home is likely within 24 hours
- Enter “ADMIT OBSERVATION WARD” on the Emergency Department notes and on Symphony
- Must complete a properly labelled Observation ward proforma and ensure all tasks have been completed in accordance to each individual condition.
- Must write up the patient’s regular medication (where appropriate) on a properly labelled drug kardex and prescribe iv fluids if required.
- Analgesia must be prescribed regularly.
- Ask the Emergency Department nursing staff to arrange admission to the Observation ward
- There can be NO OBSERVATION WARD OUTLIERS if no bed is available refer on to medical/ surgical team.

**d) Medical Re-assessment**

It is essential that patients' progress in the Observation Ward is reassessed regularly. There is a named Consultant responsible for this area throughout the day. However if you admit to the ward it is YOUR responsibility to ensure that the patient receives the correct investigation/ management. For some conditions Nurse led discharge may be appropriate if certain criteria are met (see proformas)

**e) Emergencies in the Observation Ward**

Emergencies in the Obs Ward will be managed in exactly the same way as those arising elsewhere in the Emergency Department. Clinical guidelines and policies are available in the Emergency Department Handbook. If necessary patients who become critically ill can be escorted by a doctor to the Emergency Department resuscitation room immediately for further care (it should not normally be necessary to move the patient from a bed onto a trolley for this purpose). Patients may require onward referral to the appropriate inpatient speciality; contact the SHO for admissions via the on call bleep.

**f) Mental Health Presentations**

Patients on the combined medical and mental health pathway should be managed according to the pathway. A focused mental health assessment should be performed if there will not be a timely mental health assessment by the CRHTT or patient is at high risk of absconding.

**g) Discharging Patients**

Patients should be discharged home according to the Trust's Discharge Policy. The discharging doctor is responsible for completing a handwritten discharge coding and medication record and filling out the relevant details (Diagnosis, DADT and relevant details) on the Symphony system. Nurse led discharge should be facilitated where possible.

## CONSENT

Written consent must be obtained before any procedure such as reduction, fb removal, incision & drainage. Fingertip surgery using the Hospital's consent forms (if in doubt re the need for written consent, ask an EM consultant)

*This section on consent is taken from "12 Key points on Consent: The law in Northern Ireland"; a guideline from the Chief Medical Officer for NI*

When do health and social care professionals need consent from patients/clients?

1. Before you examine, treat or care for patients/clients who are competent you must obtain their consent.
2. Adults and young people aged over 16 are always assumed to be competent unless demonstrated otherwise. If you have doubts about their competence, the question to ask is: "can this patient/client understand and weight up the information needed to make this decision?" Unexpected decisions do not prove the person is incompetent, but may indicate a need for further information or explanation.
3. Patients/clients may be competent to make some health and social care decisions, even if they are not competent to make others.
4. Giving and obtaining consent is usually a process, not a one-off event. Individuals can change their minds and withdraw consent at any time. If there is any doubt, you should always check that the patient/client still consents to your caring for or treating them.
5. Can children give consent?

Before examining, treating or caring for a child, you must also seek consent. Young people aged 16 and 17 are presumed to have the competence to give consent for themselves. Younger children who understand fully what is involved in the proposed procedure can also give consent (although their parents should ideally be involved). In other cases, someone with parental responsibility must give consent on the child's behalf, unless they cannot be reached in an emergency. If a competent child consents to treatment, a parent cannot over-ride that consent. Legally, a parent can consent if a competent child refuses, but it is likely that taking such a serious step will be rare.

Who is the right person to seek consent from a patient/client?

6. It is always best for the person actually treating or caring for the patient/client to seek consent. However, you may seek consent on behalf of colleagues if you are capable of performing the procedure in question, or if you have been specially trained to seek consent for that procedure.

What information should be provided when seeking consent?

7. Patients/clients need sufficient information before they can decide whether to give their consent; for example, information about the benefits

and risks of the proposed treatment or course of action and appropriate alternatives. If an individual is not offered as much information as they reasonably need to reach an informed decision, and in a form they can understand, his/her consent may not be valid.

Is the patient's consent voluntary?

8. Consent must be given voluntarily; not under any form or duress or undue influence from health or social care professionals, family or friends.

Does it matter how the patient gives consent?

9. No: consent can be written, oral or non-verbal. A signature on a consent form does not itself prove the consent is valid – the point of the form is to record the patient's decision and also increasingly the discussions that have taken place. Your Trust or organisation may have a policy setting out when you need to obtain written consent.

Refusals of treatment

10. Competent individuals have the right to refuse treatment or care, even where it would clearly benefit them. The only exception to this rule is where the treatment is for a mental disorder and the patient is detained under the Mental Health (Northern Ireland) Order 1986. A competent pregnant woman may refuse any treatment, even if this would be detrimental to the foetus.

Adults who are not competent to give consent

11. No-one can give consent on behalf of an adult who is not deemed competent. However, you may still treat such a patient if the treatment would be in their best interests. 'Best interests' go wider than best medical or social care interest, to include factors such as the wishes and beliefs of the patient when competent, their current wishes, their general well-being and their spiritual and religious welfare. People close to the patient may be able to give you information on some of these matters. Where the patient has never been competent, relatives, carers and friends may be best placed to advise on the patient's/clients needs and preferences.

12. If patient/client who is now deemed not competent has clearly indicated in the past, while competent, that they would refuse treatment in certain circumstances (an 'advance refusal') and those circumstances arise, you must abide by that refusal.

*This short summary cannot cover all situations, further guidance will, therefore, be issued by the DHSSPS.*

The hospital has consent forms that need to be used. It is your responsibility to know common procedures you will be doing and potential risks involved.

## HEALTHCARE ASSOCIATED INFECTIONS

HCAI are a PREVENTABLE cause of illness, misery and even death. As a doctor, you have a duty to protect your patients from HCAI. Average rates of HCAI vary from 15-30 % but experts say that ALL cases are avoidable.

HCAI include

- Staph Aureus /MRSA
- C Difficile Associated Diarrhoea
- Norovirus Gastroenteritis
- Extended Spectrum Beta Lactamase Producing Organisms (eg coliforms)
- Glycopeptide-resistant enterococci
- Blood Borne Virus Infections

### THE THREE PILLARS OF HCAI PREVENTION ARE

1. HAND HYGEIN
2. ENVIRONMENTAL CLEANLINESS
3. EFFECTIVE PRESCRIBING

- Wash or cleanse you hands thoroughly\* between patients – and be seen doing it!
- Use the correct gloves, aprons etc for the type of procedure you are undertaking and dispose of these properly
- If you see blood spills, contaminated equipment etc, alert nursing staff but where possible clean up after yourself. Maintaining a clean environment is EVERYONE’S business
- Dispose of sharps and other clinical waste safely
- Adhere to the Trust’s Guidelines on Empiric Antibiotic Prescribing for Secondary Care ( on PC desktops)
- Do not prescribe unnecessary or “routine” proton pump inhibitors; they predispose to CDAD
- If you have an infectious disease do not expose patients or colleagues to the infection
- Be vigilant about admitting patients with a potential infection risk to general wards
- Only insert venflons if appropriate and using a clean technique

\*When washing your hands, your forearms should be completely bare – no watches, sleeves etc- use the standardised “seven step” method to ensure all surfaces of your **hands are** cleaned and, for assurance and reassurance, make sure that whenever possible you are seen doing this by patients and colleagues.

## DIFFICULT INTERACTIONS WITH PATIENTS AND RELATIVES

- *“Listen to people - we aren’t always right!”*
- *“You are not obliged to treat aggressive or verbally abusive patients”*
- *this Emergency Department has a well below average number of violent incidents*

Remember that when you are angry you are more likely to misjudge situations. Battles with relatives are notorious sources of future complaints or mistakes - be careful. Keep situations calm by using phrases like “it is my job to help you” or “you’re obviously very annoyed, would it help to speak to another doctor or the nurse in charge?”

Patients have the right to know your name, the ED consultant and the nurse responsible for their care. If a patient is dissatisfied and this cannot be resolved on the spot they have a right to make a formal complaint that can be written or telephoned to one of the Trust’s complaints officers (there are leaflets about this in the waiting area). Formal complaints like this are taken very seriously and are to be avoided if at all possible. If you are locked in conflict with a patient or relatives ask a medical or senior nursing colleague to speak to them - they can usually diffuse the situation.

Some patients are violent or are mentally ill, intoxicated and so on. You must never take risks with them or endanger other staff - always ensure that such patients cannot corner anyone and that all involved in their care are aware of the danger. If you want you can carry one of the department’s personal alarms when working out-of-hours. Ask the Emergency Department Sister for details.

*You are not obliged to treat aggressive or verbally abusive patients* and you can ask hospital security staff or the police to remove them if necessary - you do not have to treat them first. Make sure that there is *medical and nursing* documentation of such events. If a patient becomes violent, *leave as quickly as possible* and raise the alarm. In the extremely unlikely event of your being cornered by a “patient” carrying any form of weapon, wait to be rescued – other staff will raise the alarm on your behalf.

- Experienced staff are better at handling violent/aggressive patients
- You must take reasonable steps to exclude a physical cause for violence/confusion – consider hypoxia, metabolic upset, CNS lesion etc.

NB: There are guidelines for rapid sedation of the violent psychotic patient in the CLINICAL section.

## SECURITY CHECKLIST

*Your safety is paramount. Be aware for potentially aggressive patients.*

### **Potential trigger conditions:**

- Known aggressive patient or relative
- History of aggressive behaviour from NIAS / PSNI
- Alcohol or substance misuse
- Psychosis or personality disorder

### **Danger Signals:**

- Agitation
- Confrontational behaviour
- Gesturing

### **Actions:**

- keep patient safe
  - keep yourself safe
  - keep department safe including other staff and patients
1. Identify these patients early and assess in timely fashion
  2. Inform nurse in charge and EPIC/senior doctor
  3. Take patient into cubicle near a nursing base
  4. Ensure patient safety – keep door open / obstacle free, inform named nurse of cubicle when entering or bring chaperone
  5. Use diffusing techniques as appropriate or escalate to more experienced staff
  6. Escalate to security +/- PSNI as necessary

### **If escalation of violence occurs**

- Ensure own safety and that of staff
- Call PSNI
- Document incident

## LEGAL AND ETHICAL ISSUES

All doctors are expected to have read and to adhere to the GMC's publications "Good Medical Practice" & "Maintaining Good Medical Practice" as well as their publications on transmissible diseases, research and consent. If you have lost your copies, replace them or visit the GMC website(www.gmc-uk.org). The law is also powerful and ED doctors can get into even worse trouble if they choose to ignore it. It is important to understand the law's view of the doctor-patient relationship before setting foot in an Emergency Department. An outline is given below under the heading of "consent". It is also essential to be familiar with the basics of Child Protection. In addition to the information in the clinical section and the Induction Course, you can consult the booklet "Child Protection: Medical Responsibilities" or ask a senior Emergency Department doctor.

### **a) Chaperones**

Doctors should be familiar with the importance of obtaining informed consent and a chaperone prior to performing intimate examinations on patients. While a chaperone is not necessary on every occasion, a proper explanation of the nature and purpose of the examination is. If any patient declines or exhibits any reluctance for the examination a chaperone should be offered. No examination should be carried out on a patient without consent unless it is an emergency and their capacity is impaired. Allegations of sexual misconduct have been made against Emergency Department medical staff after they have simply carried out "routine" medical procedures – you must protect yourself against such allegations.

Patients also have the right to refuse a chaperone, document this in the notes.

The commonest setting for an allegation of sexual misconduct in the Emergency Department is the patient with low back pain or a suspected spinal injury. Patients do not understand why a rectal / peri-anal examination is needed in this situation – make sure consent for this procedure is fully informed.

**b) The Coroner: 028 9044 6800 (also Sudden Unexpected Death in Infancy in CLINICAL SECTION)**

- *It is NOT necessary to inform the Coroner about all deaths in the Emergency Department.*

The coroner should be informed about any deaths in the following circumstances:

- A doctor did not treat the person during their last illness
- A doctor did not see or treat them within the last 28 days before they died
- The cause was sudden, violent or unnatural such as an accident, or suicide
- The cause of death was murder
- The cause of death was an industrial disease of the lungs
- There is a question of negligence or misadventure about the treatment of the person who died
- The patient died before a provisional diagnosis was made and the GP is not willing to certify the cause
- The patient died as a result of administration of anaesthetic
- The death occurred in other circumstances that may require investigation

In hours:                   Contact the coroner directly and give verbal +/- written clinical summary  
                                  Contact patient's GP by telephone

Out of hours:            Leave message on answering machine to contact EPIC in morning (phone 1286)  
                                  Write clinical summary and leave in handover diary ensuring senior doctor is aware  
                                  GP will be contacted by daytime staff

Relatives' consent is not required for a Coroner's Post Mortem, the coroner will advise whether a PM is required or not.

If a patient dies in Emergency Department, record on the flimsy whether or not: (a) a Death Certificate was issued (b) you spoke to the GP (c) you spoke to the Coroner/Coroner's Office. The letter containing these details is sent to the patient's GP within 24 hours so it is essential that this information is available.

**Coroners Letter**

On the top left when identifying who you are writing to:

HM Coroner  
Coroners Service for Northern Ireland  
(you can add address "Mays Chambers Belfast" if you wish)

*DO NOT WRITE "TO WHOM IT MAY CONCERN"*

Address the Coroner as "Sir" i.e. "Dear Sir" or "Dear Sir or Madam" and "yours faithfully" are the correct forms for this letter

Write RE : patient name, address ,date of birth.

Express regret at the death e.g. "it is with regret that I am writing to inform you of the circumstances surrounding the death of "patients name". Explain who you are e.g. "the emergency medicine trainee on duty".

When you write your summary DO NOT use any abbreviations e.g. say ventricular fibrillation not VF, cardiopulmonary resuscitation not CPR

Sign and print your full name at the bottom of your letter. Keep a copy in the clinical notes

Statements for the Coroner (i.e. for an inquest) are made on a statement of witness (PSNI) form - they are statements of fact only and should normally reflect what you have written in your clinical notes. Finish with a statement of condolence "I would like to express my sincere condolences to Mr. X's family circle... ". This is because your statement will normally be read out in court with the family present and if you are subpoenaed you may have to read it out yourself.

**c) The Police**

Police officers will frequently request statements from you, eg after RTAs and alleged assaults. You can go ahead and provide these if the PSNI officer has the necessary consent and paperwork. You report facts only (not opinion or interpretation) but seek advice from a senior doctor if unsure. If police make general requests for information or patients' details, refer them to the Consultant or SpR on call – this information is confidential and can only be released in certain situations. If police ask for a statement in reference to a Coroners investigation, they should be advised to phone Mrs Michelle Carey on extension 4661. Do not give the police a written statement directly.

Police may ask permission for the police doctor (FMO) to examine a patient or check serum alcohol. This request should only be declined if the patient is genuinely unfit – try to accommodate the police in every way possible.

#### **d) Court / Professional Witness Written Statements**

During your time in the Emergency Department you will receive requests from the PSNI for a report regarding your care for a patient that you attended. It is your responsibility to fill in this report. You get paid for it! Junior staff should seek advice from a consultant regarding completion of these forms until they are familiar with the process. They are a legal document admissible in court. If attending court, discuss with a senior doctor. It can be arranged that you need only attend when needed. It is imperative that any summons to the Coroner's Court, are discussed with a consultant.

## DEFENSIVE MEDICINE

### What is it?

Defensive medicine is commonly defined as the ordering of tests, treatments, etc, to help protect the doctor rather than to further the patient's diagnosis. Although this is not "unnecessary care", defensive medicine offers more economic and psychological benefit to the doctor than to the patient. There are two types of defensive medicine.

- Assurance behaviour (positive defensive medicine) – providing services of no medical value with the aim of reducing adverse outcomes, or persuading the legal system that the standard of care was met, e.g., ordering tests, referring patients, increased follow up, prescribing unnecessary drugs.
- Avoidance behaviour (negative defensive medicine) – reflects doctors' attempts to distance themselves from sources of legal risk, e.g., forgoing invasive procedures, removing high-risk patients from lists.

### Would defensive medicine lower the risk of litigation?

No, defensive medicine is different from defensible practice, which is good practice – defensive medicine is not: it could, in fact, make your practice more risky.

### Strategies to minimise defensive medical practices

- Communicate effectively with patients, explaining what you are doing and why
- Have robust systems for follow-up
- Be open about risk
- Offer an appropriate standard of care
- Only order tests based on a thorough clinical history and examination
- Discuss difficult cases with colleagues
- Keep clear and detailed documentation
- Know what it is you seek to exclude or confirm with a test to determine if it's necessary
- Identify learning needs (find good mentor)
- Undertake courses or independent study.

## **DO NOT ATTEMPT CARDIORESPIRATORY RESUSCITATION ORDERS**

For most patients treated in the Emergency Department, including those we admit to hospital, discussion regarding resuscitation is not applicable and therefore does not need happen.

Occasionally when patients are in extremis it will be necessary to make a decision regarding resuscitation. Decisions about resuscitation are sensitive and complex and should only be undertaken in the ED by experienced medical (ST4+) and nursing staff. The overall responsibility rests with the consultant in charge of the individual patient's care. Only if cardiac arrest is imminent should these discussions occur in the ED by ED staff, otherwise it is the responsibility of the admitting team.

The decision not to attempt CPR should be based on

- The likely clinical outcome that can be realistically expected after successful resuscitation
- The burden of resuscitation versus any possible benefit
- Imminent death expected as a natural progression of the disease process
- Valid and applicable advance directive
- Resuscitation would not be in accord with the patient's known or ascertainable wishes or their previously expressed view, feelings, beliefs and values.

If the adult patient is competent and willing to engage in the decision making process, their involvement in this is paramount. Where this is not possible, discussion with relatives can be helpful to ascertain the views of the patient. However, neither patients nor those close to them can demand treatment that is clinically inappropriate.

When paediatric patients are involved, the ED consultant and the paediatric team MUST be informed so that they can lead the process.

The DNACPR must be clearly documented in the medical and nursing notes with any discussions regarding the patient and / or family or documentation as to why the discussions did not take place. The Trust DNACPR form must also be completed and attached to the clinical notes.

## COMMON PITFALLS

Working in the Emergency Department is like walking through a minefield – you are never far from disaster! The same pitfalls catch unwary doctors again and again, *you must familiarise yourselves with these and be vigilant constantly*. To complete this section of the Handbook, this overview provides the key pointers that will reduce your chances of getting caught. Try to learn it by heart - it will be well worth the trouble!

- **A is for aortic aneurysms & ankle fractures**

**Aortic aneurysm** should be suspected in every patient over 50 with abdominal or back pain. It should be excluded asap in all elderly patients presenting with renal colic but no stone on KUB. If in doubt request urgent USS/ CT scan.

**Ankles** or feet must be x-rayed if an Ottawa Ankle Rule criterion applies. Always put new fractured ankles in non-weight-bearing split casts and refer bimalleolar fractures or those with talar shift to the RVH fracture clinic.

- **B is for bleeding into the abdomen after trauma**

Some patients can lose **more than one third of their blood volume** without obvious signs of bleeding. You must use ATLS principles to exclude abdominal bleeding after trauma.

- **C is for central disc protrusion and chest pain**

Patients with low back pain must have a full neurological examination of the lower limbs (including a rectal examination if there is doubt) and they must be questioned about bladder symptoms. If over 55 then consider ESR. Urgent neurosurgical consult +/- CT scan if NS signs. **NEVER admit to ward.**

**Chest pain** is a common presentation and if thought to be cardiac then the cardiac protocols must be followed to the letter. If problems with the advice given, then ED consultant on-call must be contacted.

- **D is for drunks with head injury, dislocated knee joints & diabetes**

**Drunk patients** may have serious head injury, may have myocardial infarction etc, etc. YOU MUST assess them as if they were sober...and don't measure serum alcohol!!

**Dislocated knees** (*not patella*) are associated with arterial damage. Even if reduced before arrival at hospital, you must discuss with fracture clinic RVH. Be wary of wounds and sepsis in patients with **diabetes**. X-ray all soft tissue infections for underlying osteomyelitis.

- **E is for ectopic pregnancy**

Abdominal pain aged 15 to 50? Record LMP and do urine HCG.

- **F is for fractured neck of femur, fat pad signs & follow-up x-rays**

**Fractured neck of femur** can be a difficult diagnosis. Impacted fractures may not show up on the first x-ray – even radiologists miss them! It is important to advise and document the patient to re-attend if severe hip pain or difficulty in weight-bearing persist for more than 48 hours. If they come back; always repeat the x-ray. Always scrutinise the pubic rami, if there is no fracture in the NOF – missing fractures here is a very common error in these patients. Consider CT if they are very painful.

**Fat pad signs** may be the only clues to subtle fractures around the elbow joint. Look for them and treat with collar + cuff, even if you can't find the fracture. Refer to review clinic day ten. An elbow that cannot straighten has a fracture. Treat symptomatically.

*Follow up x-rays* of all limb fractures should be done by day 10 at the latest. You MUST ensure that this happens by ensuring there is a follow up fracture clinic appointment is made.

- **G is for glass**

All patients with wounds caused by **glass** or by metal fragments MUST have an x-ray. Wood etc is not radio-opaque – seek senior opinion if embedded FB is suspected. Do not remove FBs unless clearly visible or easily palpable and superficial – refer to senior Emergency Department doctor. Once removed, repeat the x-ray.

- **H is for hand and wrist lacerations & hyperventilation & head injuries on warfarin**

**Hand & wrist lacerations** carry a high risk of nerve, vascular and tendon injury. Examine and document meticulously. Advise patients to re-attend if any loss of sensation or movement. Use a tourniquet to examine prior to suturing so that you can explore the wound properly.

**Hyperventilation** is usually caused by a panic attack but there are other important causes e.g. aspirin OD, severe dehydration etc. and you must exclude DKA by checking BM.

**Head injuries on warfarin** warrant meticulous examination, an INR and a CT brain / observation.

- **I is for ischaemic feet and ischaemic bowel**

Patients who attend the ED with foot pain unrelated to injury have a surprisingly high incidence of peripheral vascular disease. All must have complete examination of lower limbs – ask about claudication. This also applies to patients who present with 'DVT'.

Consider ischaemic bowel in patients > 55 with abdominal pain out of keeping with clinical findings, especially if AF or IDH risk factors. Measure lactate and refer urgently to surgical team – this is an indication for an emergency laparotomy

- **J is for juvenile fractures**

Children's fractures can be hard to spot and upsetting to miss. Common pitfalls are buckle fracture distal radius, buckle fracture to the base of the proximal phalanx, supra-condylar fractures, fractured clavicle & spiral fracture of tibia (toddler's fracture – this can be invisible on first x-ray). Even if you cannot see the fracture on x-ray, treat on clinical suspicion with a split POP, strapping etc and arrange review at next review clinic. Be patient and look for bony tenderness or swelling (compare carefully with other side). Worry about high speed falls' e.g. bike or roller blades. Parents don't mind excessive caution as a POP has low morbidity in this group.

- **K is for kids with sepsis, dehydration & UTIs**

Small children, disabled and children with learning difficulties can be hard to assess in an Emergency Department setting. They must have a full set of vital signs and a full medical examination, including ENT, unless presenting with a straightforward minor injury. Record "Well Child" or "Ill Child" and "Rash" or "No rash". Pyrexia kids should receive paracetamol or ibuprofen in Triage & make sure that their clothes have been taken off. Temp is regularly re-checked for response. All should have a urine test unless there is another obvious cause for the fever. Assess for dehydration clinically (fontanelle, tongue, wet nappies, listlessness, skin) and admit if dehydrated and unable to take a bottle of Dioralyte in Emergency Department (all infants, less than 3 months, who cannot feed, must be admitted).

- **L is for late-presenting paracetamol overdose**

Patients who present between 8-15 hours after *paracetamol OD* must have Parvolex erected within 10 minutes of arrival pending serum paracetamol level. Patients who present later are a very high risk group – administer parvolex, check plasma glucose + coag. screen and admit (serum paracetamol is irrelevant at this stage)

- **M is for meningococcal disease & multiple rib fractures**

*Meningococcal disease* is a terrifying condition because it often presents as a straightforward minor illness but suddenly becomes fulminant later on. Look EVERYWHERE for a non-blanching rash. Remember that the MCD rash may begin as an 'ordinary' blanching rash. Don't ignore pallor, parental concern or listlessness. Remember that MCD-induced arthritis may present as minor injury! You can't admit every child with a temperature or a non-blanching rash but don't discharge a child who is still listless or irritable. **Always explain GLASS TEST** to parents when you are discharging a pyrexia child and always record this.

**Multiple rib fractures** imply significant trauma – admit patient if three+ fractures and do baseline blood gas.

- **N is for never miss a clinical scaphoid fracture**

Examine for this in every patient with a wrist injury (although is uncommon in young children). Look for fullness in the ASB, tenderness in the ASB, bony tenderness at the base of the thenar eminence or pain on pushing and pulling the thumb and 1<sup>st</sup> MC downward against the wrist). Treat in a split short arm plaster if any of these signs are positive and arrange review.

- **O is for ocular damage, osteoporosis and osteomyelitis**

Unlike corneal abrasions serious injuries such as corneal lacerations an *IOFB* can be PAINLESS. All eye patients must have visual acuity test, slit lamp examination, fluorescein stain and fundoscopy. X-ray orbits must be requested if any possibility of IOFB. Remember retinal detachment – refer to eyes at once if blunt trauma + any visual upset. Advise eye patients to re-attend immediately if any worse or after 48hours if not better. Don't prescribe topical steroids without an eye opinion.

Patients with *osteoporosis* are at an increased risk of fractures from minimal trauma. They may also have multiple fractures that are painless. A good physical examination and assessment in particular of pelvis, wrists and spine is required. A very high index of suspicion should be maintained. X-ray areas of bony tenderness.

Patients with Insulin dependant diabetes are at risk of *osteomyelitis* with soft tissue infection. Consider x-raying all soft tissue infections especially those associated with discharging ulcers or recurrence.

- **P is for tight or painful plaster of paris.**

Two risks here- Volkman's contracture and DVT. POP must be split immediately after triage and then removed and replaced with backslab if required. Request Doppler, if ANY suspicion of DVT. Check x-ray may be required if pop changed. All POPs MUST be split. NEVER send somebody with a fresh fracture home in an unsplit cast.

- **R is for rings**

Remove all rings on fractured upper limbs due to swelling

- **S if for severe sepsis and septic shock**

Treat urgently with IV fluids, IV antibiotics and reassess. Complete the sepsis pathway.

# A REFERENCE GUIDE TO SYMPHONY

The next four pages are a quick reference guide to the Symphony computer system.

1. ED Clinician
2. Consult
3. Diagnosis
4. DDTA / Discharge

## 1. ED Clinician

Click into 'AE CLINICIAN' on the Tracking Grid

If you hover over the DEP stage it will give you a hint as to what is required at that stage

ALL	Filter	Sort	Reg	Triage	AEClin	Ref Spec	Tre
Duck, Donald	⚠	🏠	10:23	10:23	🔪		
Vazi, Hoda	⚠	😊		13:17			

Record A+E Clinician seen

Ensure the correct patient is displayed in the Patient Banner

Search	Duck, Donald (Mr), Male, DoB: 01/01/1989, Age: 15 Years
Details	AE-04-000012-1, Consultation Rm, Bites & Stings, 24/02/2004, 10:23

Record the date and time that you have seen your patient, if need be, edit this information

A+E Clinician Seen	
Record details of A+E Clinician the patient has been seen by	
Clear All	
Date Seen By A+E Clinician	Time Seen by A+E Clinician
1 March 2004	14:37

Update the location that your patient is being moved to

## 2. Consult

Click into 'SPECIALTY' on the Tracking Grid

ALL	Filter	Sort	Reg	Triage	AEClin	Ref Spec	Treatment	X-f
Duck, Donald			10:23	10:23	16:00			
Vazi, Hoda				13:17				

Record Referral request

Ensure the correct patient is displayed in the Patient Banner

Record the date and time that you are referring your patient to a specialty, if need be, edit this information

Select the specialty to which you are referring and record any comments from the specialty, e.g. if they are caught up in theatre, and click 'ADD'

If additional referrals are required, repeat the above process

Update the patient's location as necessary

Click on the 'FINISH' button

If additional referrals are required, repeat the above process

Update the patient's location as necessary

Click on the 'FINISH' button

### 3. Diagnosis

Click on 'DIAGNOSIS' on the Tracking Grid

Ensure the correct patient is displayed in the Patient Banner

Record the date and time that you have diagnosed your patient, if need be, edit this information

Select the diagnosis for your patient and click on 'ADD'

The screenshot shows a software window titled "Diagnosis" with a light blue header. Below the header, there are four buttons: "Add", "Update", "Remove", and "Clear All". The "Add" button is circled in red. The form contains several input fields: "Diagnosis Date" (1 March 2004), "Diagnosis Time" (18:34), "Diagnosis Site", "Diagnosis Side", and "Diagnosis Comments". Below these fields, there is a list of diagnoses, with the first entry being "01/03/2004, 18:34, Well Child, Elbow, Left". At the bottom right of the window, there are "Cancel" and "Finish" buttons. A status bar at the bottom left says "Please enter diagnosis comments."

Click if additional diagnosis have been made, repeat the process above  
Update the patient's location as necessary and click on 'FINISH'

## 4. DADT / Discharge

Click on 'DIAGNOSIS' on the Tracking Grid

Record the date and time that you discharged your patient

The screenshot shows a software window titled "A+E Discharge" with a sub-header "Discharge". Below the sub-header is the instruction "Record the outcome of the attendance and the disposal of the patient". A "Clear All" button is located at the top left of the form area. The form contains several input fields:

- Discharge Date:** A dropdown menu showing "2 March 2004".
- Discharge Time:** A text input field containing "08:38".
- Discharge Outcome:** A dropdown menu showing "Home".
- Discharge Destination:** A dropdown menu showing "Not Known".
- Patient needs to be contacted (for DNW's):** A dropdown menu showing "No".
- Comments for GP:** A text area containing "patient well".

At the bottom of the window, there is a taskbar with various system icons.

Select the discharge outcome and destination and add any comments  
Update the patient's location to 'LEFT DEPARTMENT'

## **SECTION THREE – CLINICAL GUIDANCE (ADULTS)**

**Study this section and use it for reference**

## ABC – SERIOUSLY ILL ADULTS: SIMPLE OVERVIEW

### **AIRWAY:**

- Assessment: The airway is blocked if:  
the patient is unconscious  
breathing is noisy  
chest is moving but no air entry
  
- Treatment: Jaw thrust manoeuvre  
Yankeur suction  
Guedel airway, nasopharyngeal airway,  
LMA  
Cuffed endotracheal tube if no gag reflex  
Surgical cricothyroidotomy if above methods fail

### **BREATHING:**

- Assessment: Rate, depth and work. Trachea.
  
- Treatment: Assist with a bag-valve mask if rate or depth insufficient  
Treat tension pneumothorax\*  
Give 100% oxygen by a NRRM

### **CIRCULATION:**

- Assessment: Pulse, capillary refill, respiratory rate, BP
  
- Treatment: CPR if no major pulse  
Remember the causes of PEA\*\*  
Treat hypovolaemia aggressively with 2 litres fluid initially  
(occult bleeding?- GI bleeding or AAA)  
Remember anaphylaxis as a cause of unexplained shock

\* Tension pneumothorax: Jugular venous distension, trachea deviated, reduced air entry, hyper-resonant to percussion. Release *immediately* by inserting brown venflon into 2<sup>nd</sup> intercostal space mid-clavicular line then arrange for chest drain.

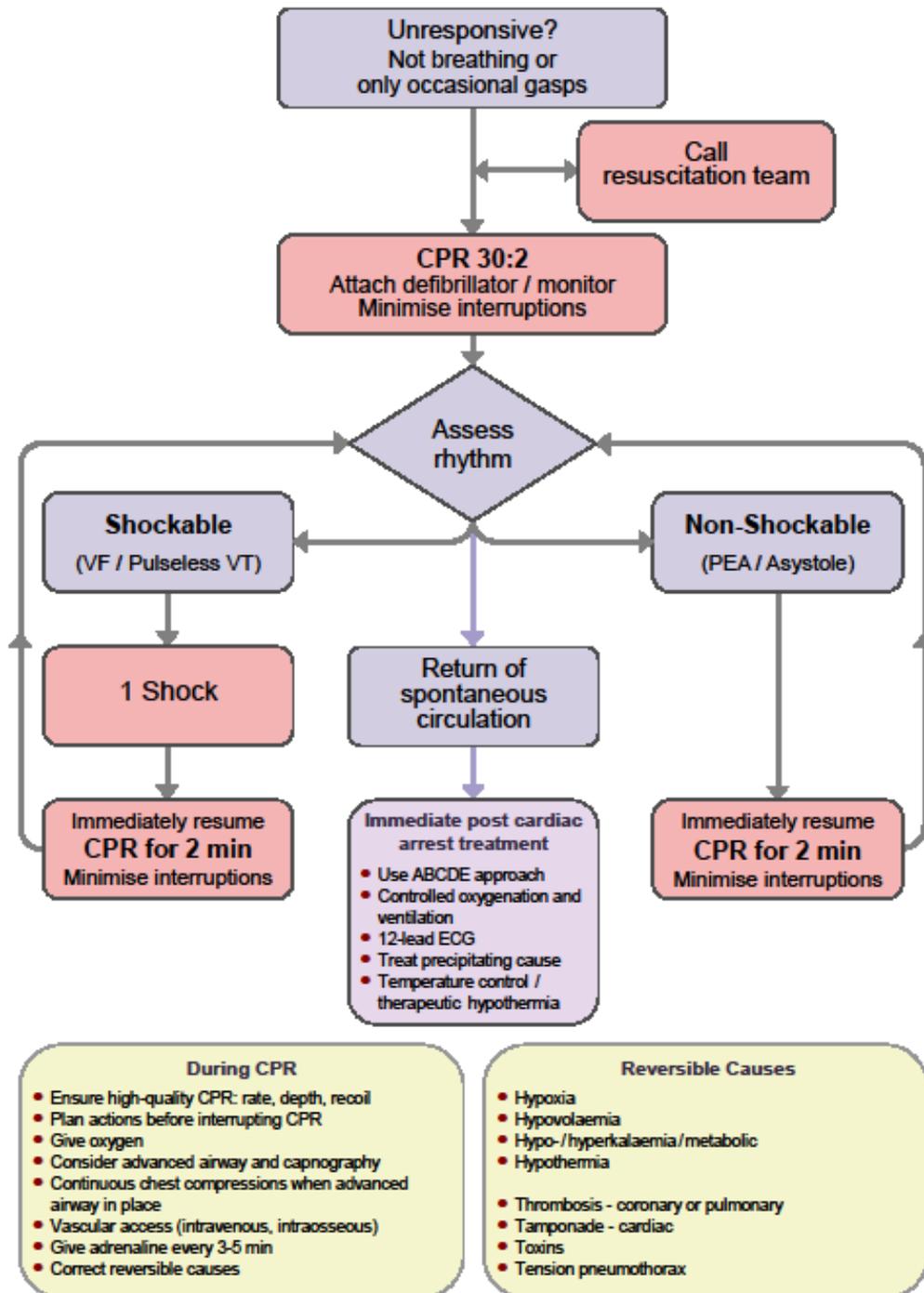
\*\*PEA: Tension pneumothorax, hypovolaemia, drugs, pulmonary embolism, hypothermia, cardiac tamponade, electrolyte disturbance, massive brain injury, cardiac rupture

This department has an **AUTOPULSE** machine which provides excellent circulatory support in cardiac arrest where it is felt that the resuscitation will be prolonged. You will be provided with training on this during your induction.

## **EWS: EARLY RECOGNITION OF A SICK OR DETERIORATING ADULT PATIENT**

Sometimes patients can be very sick but superficially look OK to less experienced doctors and nurses. They seem to crash suddenly but in retrospect the signs were there for some time. Early Warning Scores help doctors and nurses to detect relatively subtle signs of decompensation before the patient crashes, greatly increasing their chances of survival. The NEWS score used in Antrim Hospital is based on a province-wide guideline. The related actions are MANDATORY and subject to regular audit.

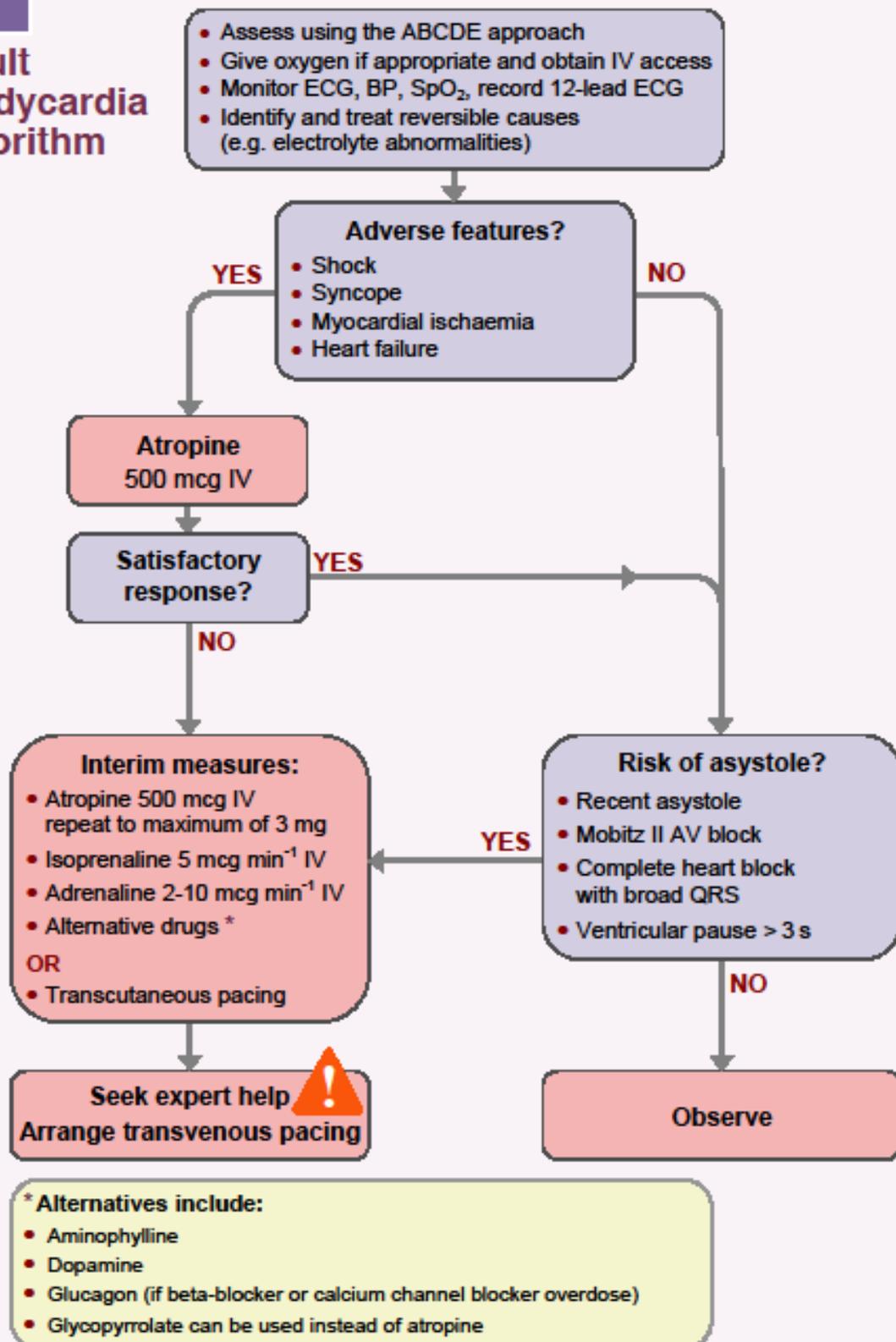
## Adult Advanced Life Support



This department has biphasic defibrillators.

VF or Broad complex tachycardia	-----	150 for all shocks
Narrow complex tachycardia	-----	70 incrementing to 150
Paediatric defibrillation	-----	4 joules/kg

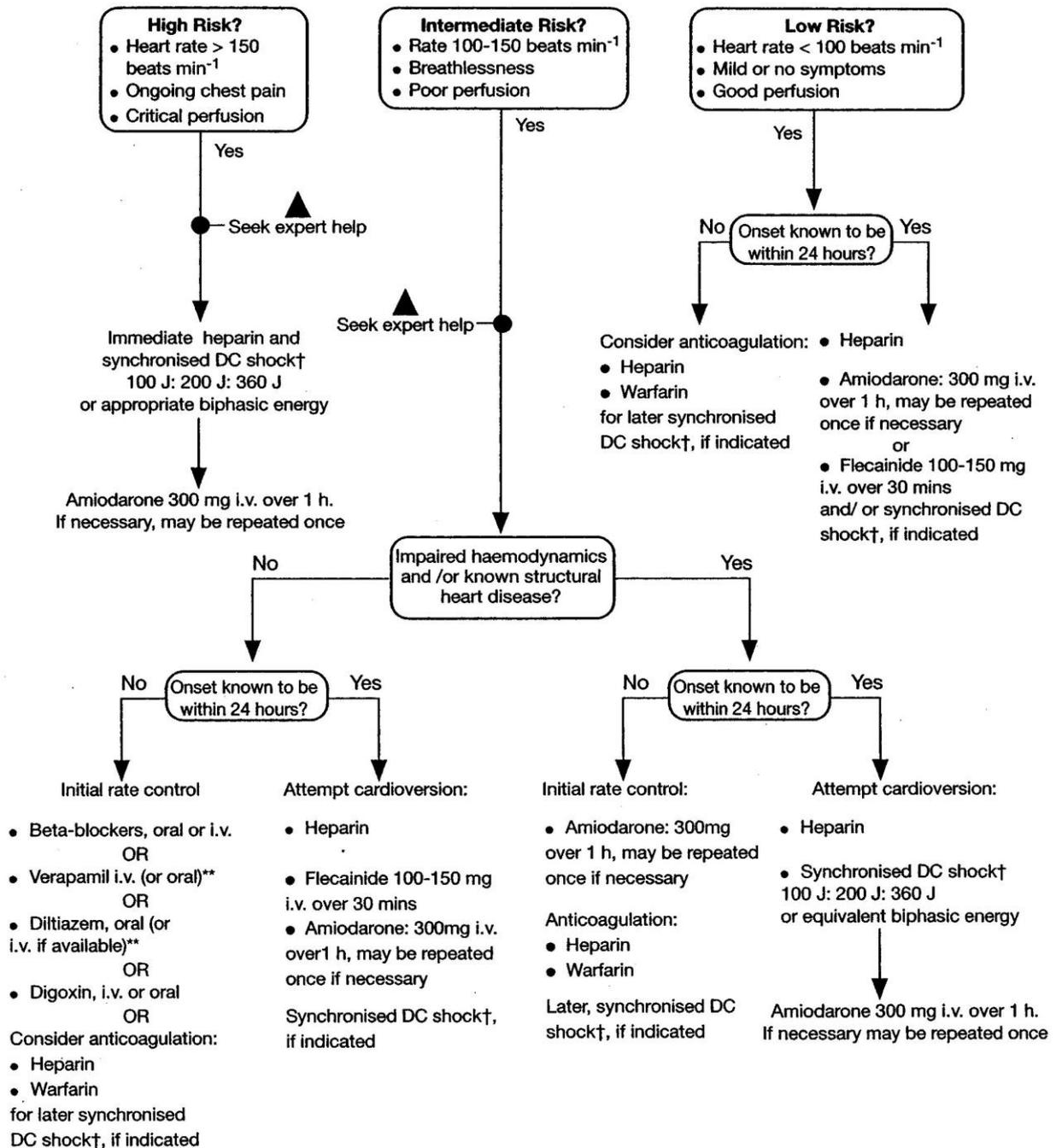
## Adult bradycardia algorithm





## Atrial Fibrillation

If appropriate, give oxygen and establish i.v. access

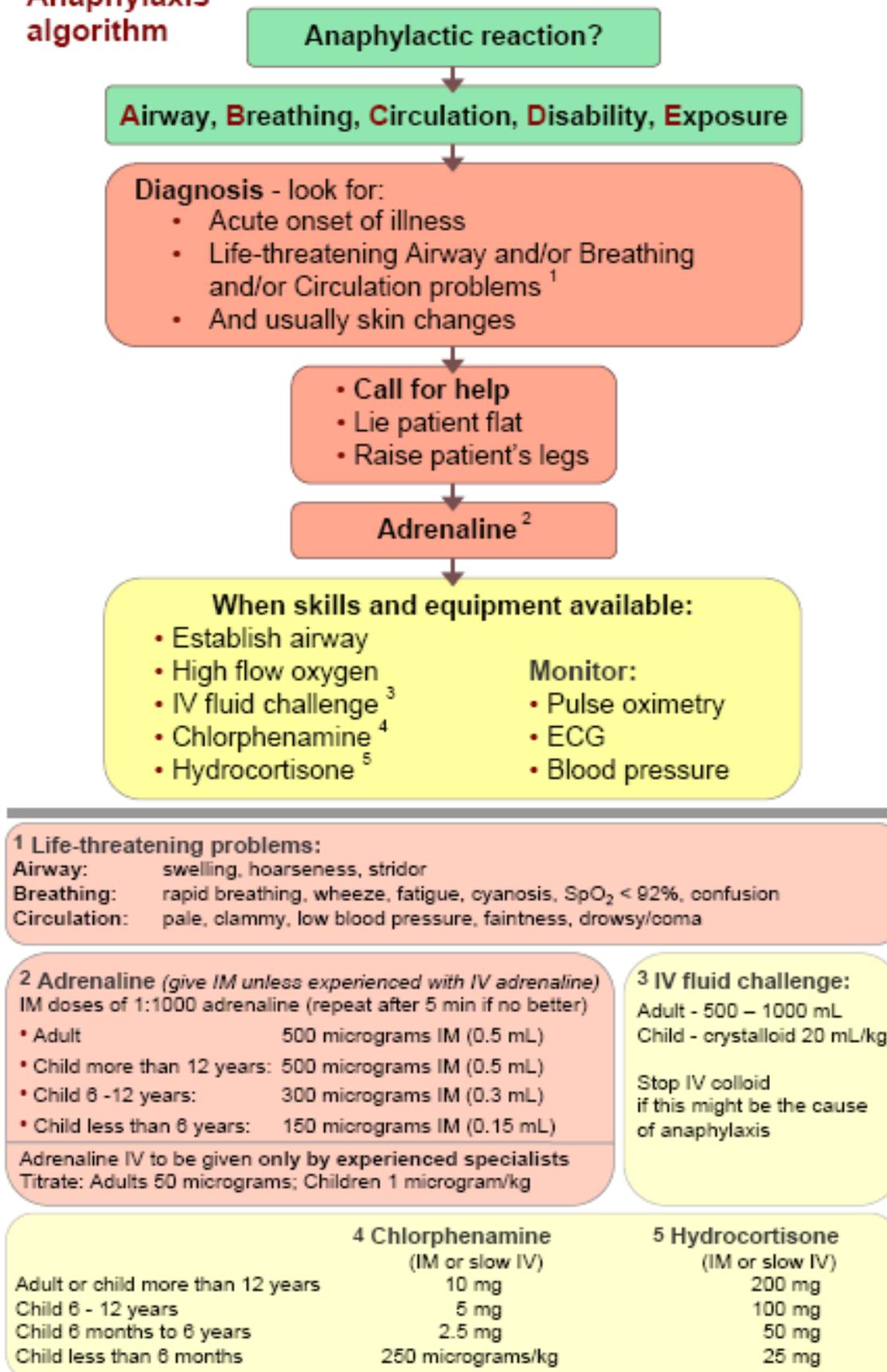


Doses throughout are based on adult of average body weight

† Note 1: DC shock is always given under sedation/ general anaesthesia.

\*\* Note 2: NOT TO BE USED IN PATIENTS RECEIVING BETA-BLOCKERS

## Anaphylaxis algorithm



## SHOCK – INADEQUATE TISSUE PERFUSION

Recognise early

Give oxygen and fluids then find out the cause !

### 1. Hypovolaemia:

- Early signs are tachycardia, tachypnoea (without increased respiratory effort, delayed capillary refill and poor urinary output)
- Hypotension is a late sign
- Apart from trauma, common causes of occult blood loss are ruptured abdominal aneurysm and GI bleeding (do a PR)

### 2. Cardiogenic:

- Hypoperfusion with jugular venous distension. Abnormal ECG
- Unless you are certain, consider a fluid challenge +/- CVP monitoring prior to inotropes
- Remember tension pneumothorax, cardiac tamponade and massive pulmonary embolism can present this way – exclude by clinical examination and CXR

### 3. Anaphylactic:

- Possible history of previous anaphylaxis, collapse, potential allergen
- May be upper respiratory tract obstruction as well
- Adrenaline 0.5ml of 1 in 1000 IM repeated if ineffective and IV fluids

### 4. Neurogenic:

- Overt spinal trauma or unsuspected spine injury (e.g. with head injury)
- Hypotension but normal or increased capillary refill time
- Meticulous spinal care, IV fluids in moderation, maintain normal temperature

### 5. Septic:

- Hypotension, pyrexia, tachypnoea, metabolic acidosis, altered mental status
- IV fluids, broad spectrum IV antibiotics (e.g. Tazocin and gentamicin)
- Specific antibiotics for special types of septic shock e.g. toxic shock syndrome, meningococcal septicaemia.

**Note the surviving sepsis campaign and the following sepsis bundles on the next page. Complete the sepsis proforma.**

**Involve ITU in any patient with shock not responding to initial treatment**

## SEPSIS CARE BUNDLES

### 1. Sepsis Six – To be completed within first hour of recognition of severe sepsis or septic shock

Address simultaneously; target time: (1h from presentation)			Time when task	Initials
<b>1</b>	<b>100% oxygen</b>	Give 15L/min via facemask with reservoir bag unless oxygen restriction necessary (e.g. in chronic CO <sub>2</sub> retention aim for an SaO <sub>2</sub> of		
<b>2</b>	<b>IV fluids</b>	Give a 500mL - 1000mL bolus of crystalloid (i.e. 0.9% saline or Hartmann's solution) over 30 - 60min. In patients with an initial systolic BP <90 or a lactate >4, give a larger (20mL/kg) bolus. Involve your middle grade doctor or consultant if further fluid resuscitation is required. Give additional boluses of 250-500mL if		
<b>3</b>	<b>Blood cultures</b>	Take a minimum 2 sets, including at least one from a fresh venepuncture. Also send sputum culture / wound swabs etc. as		
<b>4</b>	<b>IV antibiotics</b>	Ensure cultures have been taken first. Prescribe in full compliance with local antimicrobial guidelines; contact microbiologist if in doubt. Document target time ('to be given by'-time) in drug chart and inform	Prescribed by	
			Given by	
<b>5</b>	<b>Lactate, Hb &amp; other blood tests</b>	Lactate requires blood gas analysis (venous sample is acceptable; ensure sample is sent on ice if delay to analysis anticipated). Also request FBC, U&E, LFT, clotting (INR and APTT) and glucose.		
		Repeat lactate after first-hour care duties have been completed.		
		Arrange transfusion if required (target Hb =7). p Not required, as Hb >7	Prescribed Given by	
<b>6</b>	<b>Catheter</b>	Dip CSU; send for C&S as appropriate. Monitor urine output hourly.		
<b>Discuss further management plan with your middle grade doctor or</b>				

### 2. Resuscitation Bundle – to be completed within four hours of recognition of severe sepsis or septic shock

Initial tasks		Time when	Initials
<b>Fluid</b>	Check that patient has received an initial 20mL/kg bolus of		
<b>ITU assessment</b>	Arrange urgent review by ITU team.		
<b>CVP line</b>	Insert urgently under US guidance and in an appropriate environment (e.g. resuscitation or procedure room / theatre). Seek help from your seniors or ITU team if you do not yet have the		
<b>HDU / ITU care</b>	Ensure a bed of the appropriate care level is allocated to patient.		
Goals to be achieved by: (4h from presentation / breach time)		Time task initiated	Initials
<b>Source control</b>	Remove any infected urinary catheter or other indwelling device; arrange for abscess drainage / laparotomy etc. as needed.		
<b>CVP 8-12mmHg</b>	Give 500 - 1000mL IV bolus of crystalloid every 30min until goal achieved.		
<b>MAP 65mmHg</b>	Patients needs Noradrenaline if MAP <65 despite adequate CVP (unless ITU care is deemed inappropriate and reason has been		
<b>ScvO<sub>2</sub> 70%</b>	Take blood gas sample from CVP line at regular intervals to determine central venous oxygen saturation (ScvO <sub>2</sub> ). Patient needs Dobutamine (in ITU) if goal not achieved despite Hb >7 and		
<b>Discuss further management plan with your middle grade doctor or</b>			

## ABDOMINAL AORTIC ANEURYSM

*Patients with a leaking aneurysm are bleeding to death*

### Suspect leaking aneurysm if:

- Over 55 AND
- Severe Abdominal Pain/'Renal Colic' (haematuria is common)/ Low Back Pain OR
- Unexplained Shock OR
- Known AAA and pain or shock



Patient is examined by the most senior doctor in the ED IMMEDIATELY +/- USS if competent

If AAA still suspected:

- Contact vascular SpR in RVH via #6124
- Patient to be transferred by emergency ambulance ("blue light") to RVH for vascular assessment.
- ECG and IV access
- Do not do CT AAA - this is an unnecessary delay to definitive treatment



- Usually no doctor is required to accompany patient – surgical doctor if necessary
- Give 100% O<sub>2</sub>
- Give Morphine +/- Metoclopramide in iv aliquots
- Do not give iv fluids unless unconscious or systolic BP > 80 mmHg

Aim for a maximum time in the Emergency Department of 10 minutes.

Target call-to-surgery is 60 minutes

## CARDIAC CHEST PAIN

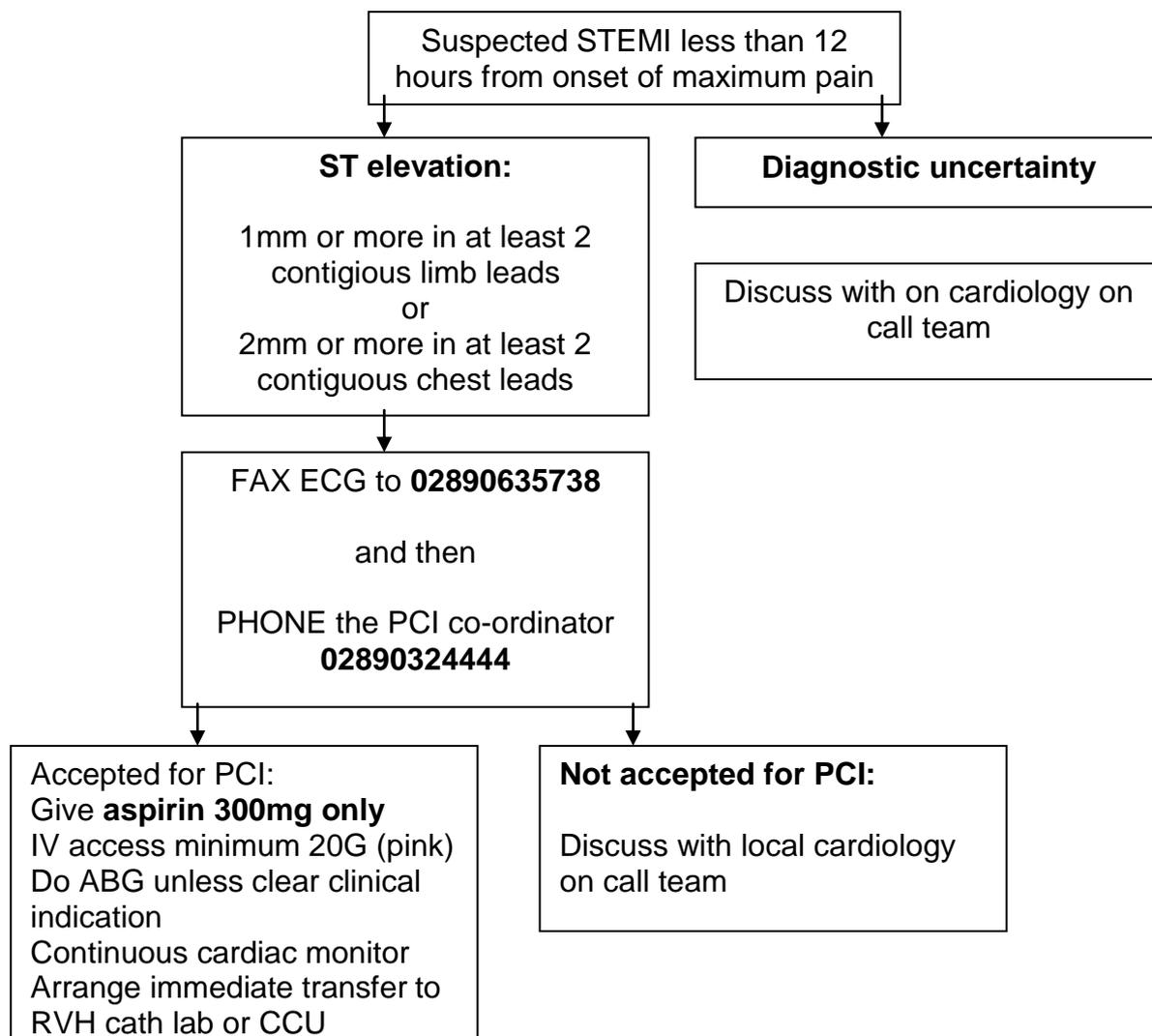
ACUTE ST ELEVATION MYOCARDIAL INFARCTION\* and ACUTE CORONARY SYNDROME (ACS) are caused by instability/rupture of atheromatous plaques in the coronary circulation. Identifying ST Elevation MI rapidly is the first goal so that definitive treatment can be achieved as early as possible to limit myocardial damage.

The ACS spectrum ranges from unstable angina (USA) to non-ST elevation myocardial infarction (NSTEMI). ACS is extremely common amongst ED patients and it is associated with high risk of cardiac arrest, peri-arrest arrhythmias, acute ST elevation myocardial infarction and acute LVF.

*\*Rarely acute MI may be caused by another cause such as cocaine abuse*

### 1. ST Elevation MI

All patients with a STEMI should be referred to RVH for consideration of primary PCI. NIAS have a bypass protocol so most patients that they attend who have a STEMI will go directly to RVH.



## **2. Non- ST Elevation MI and other Acute Coronary Syndromes**

### **History:**

Cardiac sounding chest pain  
 Atypical pain – especially females and diabetic  
 Cardiac risk factors  
 Previous MI / IHD

### **Examination:**

CVS and RS examination  
 BP in both arms and peripheral pulses if possibility of dissection thoracic aorta

**Ischaemic ECG changes:** (repeat ECG in 30 mins if suggestive history but normal initial ECG)

1. LBBB = assume anterior myocardial infarction if new
2. Profound ST depression V1-3 +/- Tall R-wave in V1 = posterior myocardial infarction
3. Tall peaked T-waves with early slurring of ST segment= ?hyperacute ischaemic ECG: GET ADVICE
4. Any other ST segment depression(“NSSTTW”) = assume Acute Coronary Syndrome unless present on old ECGs

### **Management:**

All patients with suspected ACS should receive the following treatment (unless contra-indicated e.g. on warfarin).

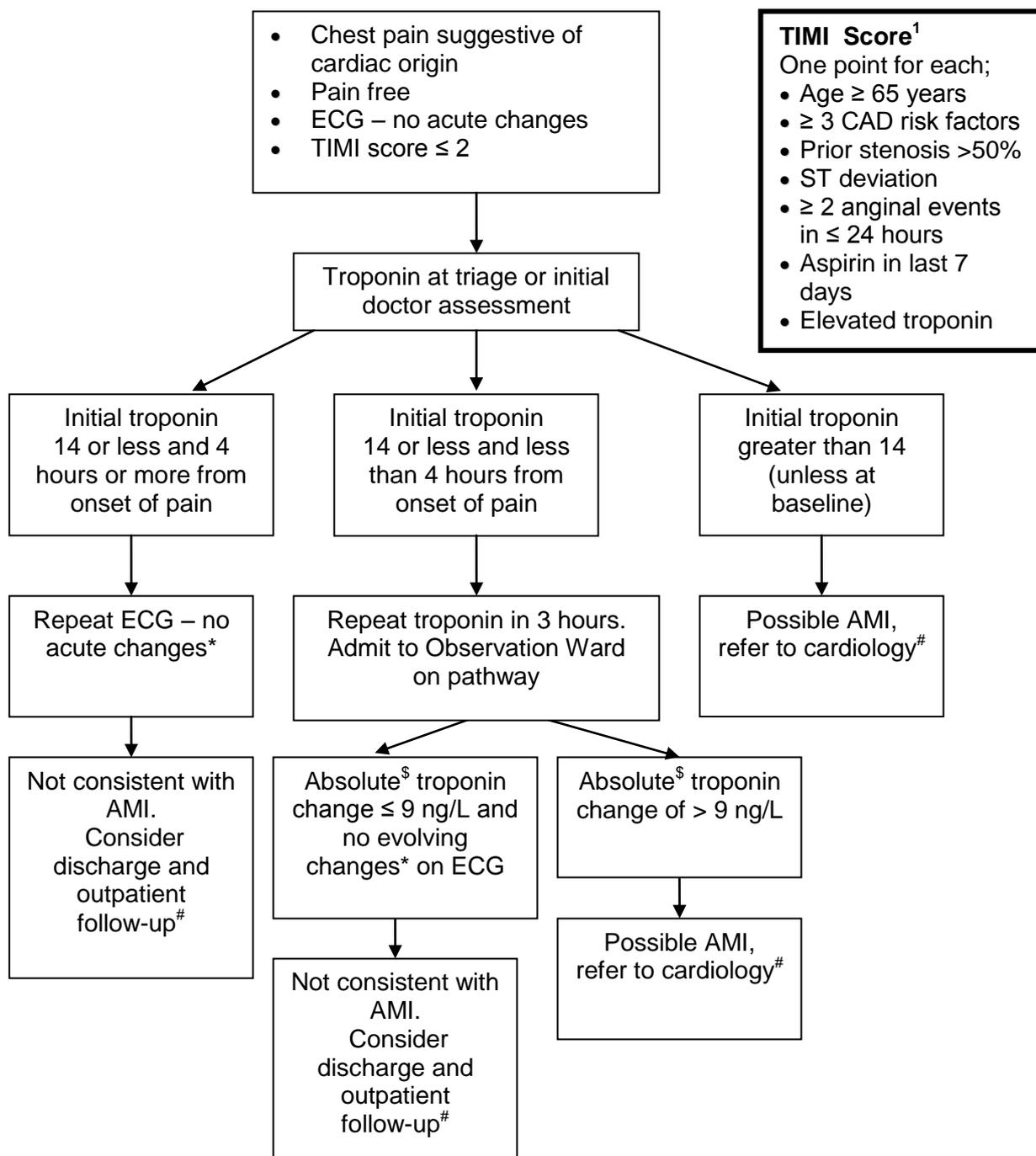
- 100 % oxygen NRRM
- Continuous ECG monitor, SaO<sub>2</sub>, NIBP
- GTN spray
- Pain relief as required e.g. diamorphine +/- metoclopramide
- Chewable Aspirin 300 mgs orally
- Enoxaparin (Clexane) 1mg/kg subcutaneously bd.
- Admit under cardiology

## **3. Low Risk Cardiac Chest Pain**

Patients with history suggestive of cardiac chest pain but who are low risk (TIMI score 2 or less) who are pain free are suitable for ED / Observation Ward management.

See flow diagram on next page for appropriate management.

**Assessment of low risk patients with cardiac sounding chest pain presenting to Antrim ED**



**References**

1. Antman EM, Cohen M, Bernink PM, et al. The TIMI Risk Score for Unstable Angina/Non–ST Elevation MI: A Method for Prognostication and Therapeutic Decision Making. *JAMA*. 2000;284(7):835-842

**Notes**

\* if acute ischaemic changes refer to cardiology

§ Absolute change equates to difference between the original and second troponin results, this may be positive or negative. Absolute change of 9 ng/L is considered clinically significant

# it is the responsibility of the discharging doctor to follow-up results and complete discharge letter

#### **4. Rapid Access Chest Pain Clinic**

The Rapid Access Chest Pain Clinic is designed to provide a 'one stop' service for patients presenting with a recent onset of chest pain thought to be stable angina or very low risk unstable angina. ED doctors on the advice of the ED consultant can refer patients directly to RACPC.

#### **5. Not all Chest Pain is Cardiac**

You will see many other types of chest pain. Common causes of chest pain include:

- Musculoskeletal pain is the commonest – take a good history!--did the patient undertake strenuous activity e.g. gardening?, do certain movements hurt? Is there a tender costo-vertebral junction suggesting an acutely subluxed rib at the back (common and self-limiting) – *but remember that ~15% of patients with acute MI have marked chest wall tenderness!*
- Upper GI – GORD, Acute Cholecystitis, Pancreatitis
- PE (use Canada Score)
- Stress, Hyperventilation
- Chest infection
- Rib fractures e.g. cough fracture
- Herpes zoster (dermatomal)

### **TRANSIENT LOSS OF CONSCIOUSNESS (TLOC)**

Significant causes of TLOC must be excluded before patients can be safely discharged home. The following is a summary of the NICE 2010 Clinical Guidelines for the Management of TLOC in adults and young people.

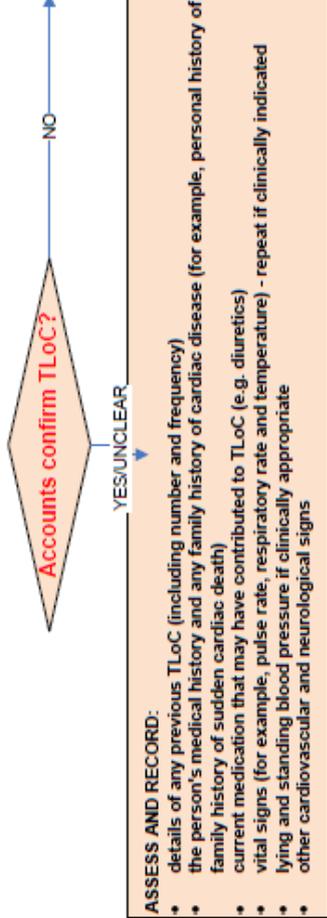
<p><b>Box A</b></p> <p>Ask the person who has had the suspected TLoC, and any witnesses, to describe what happened before, during and after the event. Try to contact by telephone witnesses who are not present. Record details about:</p> <ul style="list-style-type: none"> <li>• circumstances of the event</li> <li>• person's posture immediately before loss of consciousness</li> <li>• prodromal symptoms (such as sweating or feeling warm/hot) appearance (for example, whether eyes were open or shut) and colour of the person during the event</li> <li>• presence or absence of movement during the event (for example, limb-jerking and its duration)</li> <li>• any tongue-biting (record whether the side or the tip of the tongue was bitten)</li> <li>• injury occurring during the event (record site and severity)</li> <li>• duration of the event (onset to regaining consciousness)</li> <li>• presence or absence of confusion during the recovery period</li> <li>• weakness down one side during the recovery period.</li> </ul>	<p><b>Box B</b></p> <p>If an automated interpretation is not available, the unreported 12-lead ECG should be reviewed by a healthcare professional trained and competent in identifying the following abnormalities.</p> <ul style="list-style-type: none"> <li>• Inappropriate persistent bradycardia.</li> <li>• Any ventricular arrhythmia (including ventricular ectopic beats).</li> <li>• Long QT (corrected QT &gt; 450 ms) and short QT (corrected QT &lt; 350 ms) intervals.</li> <li>• Brugada syndrome.</li> <li>• Ventricular pre-excitation (part of Wolff-Parkinson-White syndrome).</li> <li>• Left or right ventricular hypertrophy.</li> <li>• Abnormal T wave inversion.</li> <li>• Pathological Q waves.</li> <li>• Atrial arrhythmia (sustained).</li> <li>• Paired rhythm.</li> </ul>	<p><b>Box C</b></p> <p>ECG abnormality (as specified in Box B)</p> <ul style="list-style-type: none"> <li>• Heart failure (history or physical signs)</li> <li>• TLoC during exertion</li> <li>• Family history of sudden cardiac death under 40 years and/or inherited cardiac condition</li> <li>• New or unexplained breathlessness</li> <li>• Heart murmur</li> </ul> <p>Consider referring within 24 hours for cardiovascular assessment, as above, anyone aged older than 65 years who has experienced TLoC without prodromal symptoms.</p>	<p><b>Box D</b></p> <p>Make a diagnosis of <b>uncomplicated faint</b> when:</p> <ul style="list-style-type: none"> <li>• There are no features that suggest an alternative diagnosis.....AND</li> <li>• there are features suggestive of uncomplicated faint such as:             <ul style="list-style-type: none"> <li>• Posture - prolonged standing or similar episodes which have been prevented by lying down.</li> <li>• Provoking factors (such as pain or a medical procedure).</li> <li>• Prodromal symptoms (such as sweating or feeling warm/not before TLoC).</li> </ul> </li> </ul> <p>Make a diagnosis of <b>situational syncope</b> when:</p> <ul style="list-style-type: none"> <li>• there are no features from the initial assessment that suggest an alternative diagnosis.....AND</li> <li>• syncope is clearly and consistently provoked by straining during micturition (usually while standing) or by coughing or swallowing.</li> </ul>
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Use clinical judgement to determine appropriate management and the urgency of treatment if there is:

- a condition that requires immediate action
- the person has sustained an injury as a result of TLoC or
- they have not made a full recovery of consciousness

Take patient and witness account of the suspected TLoC [box A]  
 Include paramedic records in your information gathering

Manage according to non-TLoC presentation



**12 LEAD ECG:**

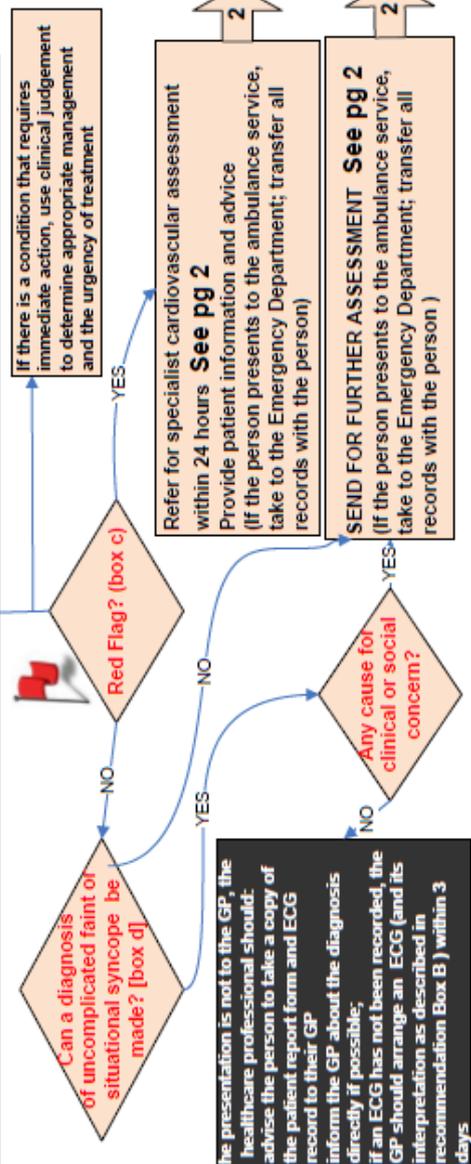
Record a 12-lead ECG using automated interpretation. 12-lead ECG – Treat as a red flag if any of the following abnormalities are reported on the ECG printout:

- conduction abnormality (e.g. complete right or left bundle branch block or any degree of heart block)
- a long or short QT interval, or
- any ST segment or T wave abnormalities

If automated ECG unavailable take manual 12 lead ECG (box b)

**ADDITIONAL TESTS:**

- if there is suspicion of an underlying problem causing TLoC, or additional to TLoC, carry out **relevant** examinations and investigations (for example, check blood glucose levels if diabetic hypoglycaemia is suspected, or haemoglobin levels if anaemia or bleeding is suspected).
- do not routinely use electroencephalogram (EEG) in the investigation of TLoC (see pg. 2 Suspected Epilepsy box)



## Further Assessment and Referral



**Suspected orthostatic hypotension** on the basis of the initial assessment when:

- there are no features suggesting an alternative diagnosis, and
- the history is typical

Yes

Measure lying and standing blood pressure (with repeated measurements whilst standing for 3 minutes)

NO

**Orthostatic hypotension is confirmed?**

YES

If orthostatic hypotension is confirmed, consider likely causes, including drug therapy, and manage appropriately (for example, see 'Falls: the assessment and prevention of falls in older people' [NICE clinical guideline 21]).

Refer all people with TLoC (apart from the exceptions below) for a specialist cardiovascular assessment by the most appropriate local service. Exceptions are:

- uncomplicated faint
- situational syncope
- orthostatic hypotension

and people whose presentation is strongly suggestive of epileptic seizures.

Advise people waiting for specialist cardiovascular assessment.

- What they should do if they have another event.
- If appropriate, how they should modify their activity (for example, by avoiding physical exertion)
- They should not drive prior to seeing cardiovascular assessment

**Suspected epilepsy** - Refer people who present with one or more of the following features (that is, features that are strongly suggestive of epileptic seizures) for an assessment by a specialist in epilepsy; the person should be seen by the specialist within 2 weeks (see 'The epilepsies: the diagnosis and management of the epilepsies in adults and children in primary and secondary care [NICE clinical guideline 20]).

- A bitten tongue.
- Head-turning to one side during TLoC.
- No memory of abnormal behaviour that was witnessed before, during or after TLoC by someone else.
- Unusual posturing
- Prolonged limb jerking (note that brief seizure-like activity can often occur during uncomplicated faints)
- Confusion following the event
- Prodromal déjà vu or jamais vu (see glossary)

Consider that the episode may not be related to epilepsy if any of the following

- Prodromal symptoms which on other occasions have been abolished by sitting or lying down.
- Sweating.
- Prolonged standing that appeared to precipitate TLoC
- Pallor during the episode

**EEG should not be used routinely in the investigation of TLoC [see CG20]**

Offer advice to people waiting for a specialist neurological assessment for their TLoC [see CG20]

## Specialist cardiovascular assessment

### HISTORY AND EXAMINATION

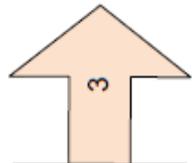
Carry out a specialist cardiovascular assessment as follows.

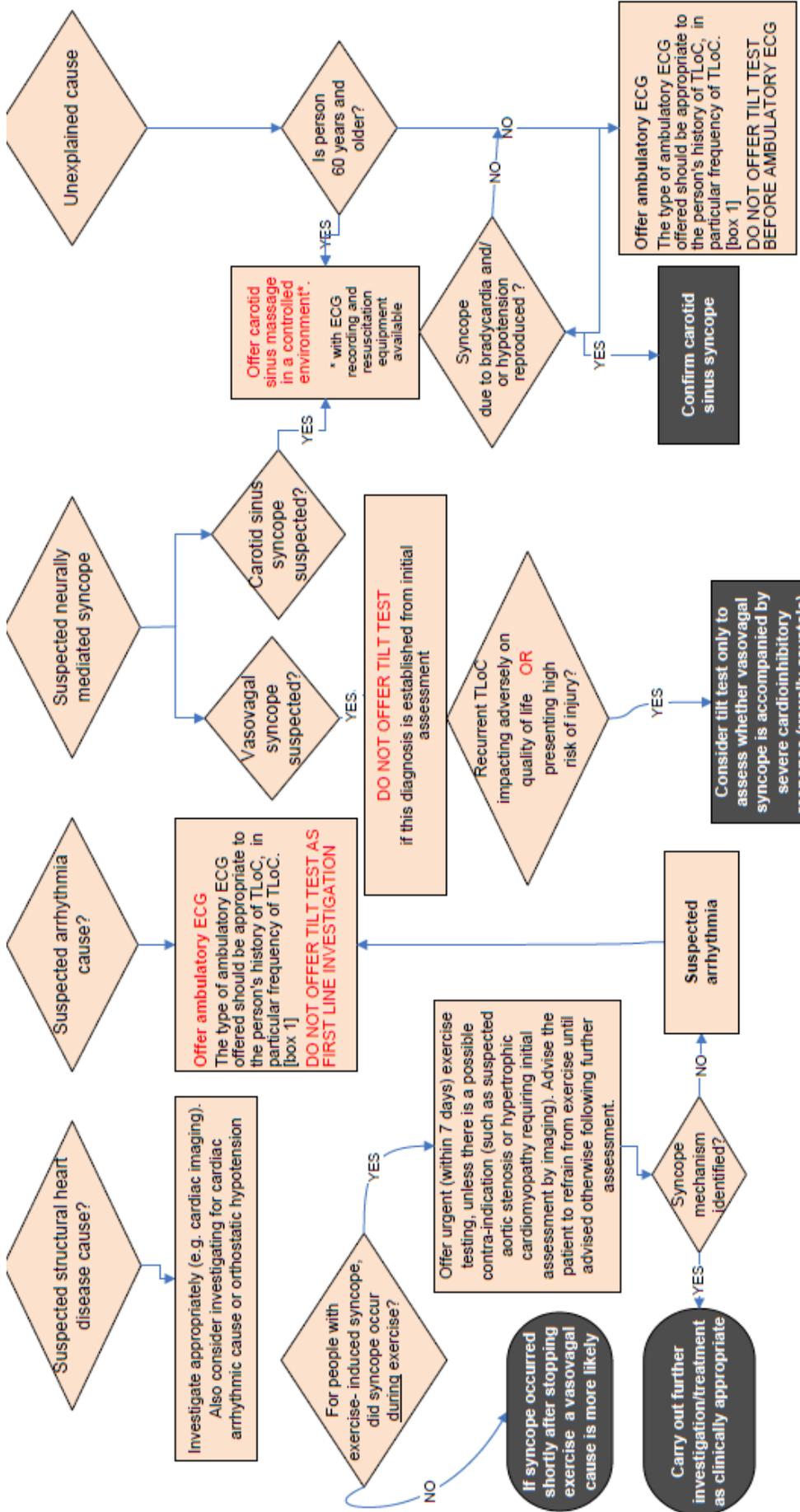
- Reassess the person's:
  - detailed history of TLoC including any previous events
  - medical history and any family history of cardiac disease or inherited cardiac condition
  - drug therapy at the time of TLoC and any subsequent changes.
- Conduct a clinical examination, including full cardiovascular examination and, if clinically appropriate, measurement of lying and standing blood pressure.
- Repeat 12-lead ECG and examine previous ECG documentation.

On the basis of this assessment, assign the person to one of the following causes of suspected syncope:

- suspected structural heart disease
- suspected cardiac arrhythmia
- suspected neurally mediated, or
- unexplained.

Offer further testing see page 3 or other tests as clinically appropriate.





**BOX 1**

For people who have:  
 • TLoC at least several times a week, offer Holter monitoring (up to 48 hours if necessary). If no further TLoC occurs during the monitoring period, offer an external event recorder that provides continuous recording with the facility for the patient to indicate when a symptomatic event has occurred.  
 • TLoC every 1-2 weeks, offer an external event recorder\*. If the person experiences further TLoC outside the period of external event recording, offer an implantable event recorder.  
 • TLoC infrequently (less than once every 2 weeks), offer an implantable event recorder. A Holter monitor should not usually be offered unless there is evidence of a conduction abnormality on the 12-lead ECG.  
 \*Excludes event recorders that do not perform continuous ECG monitoring (and therefore are not capable of documenting cardiac rhythm at the moment of TLoC).  
 When offering a person an implantable event recorder, provide one that has both patient-activated and automatic detection modes. Instruct the person and their family and/or carer how to operate the device. Advise the person that they should have prompt\*\* follow-up (data interrogation of the device) after they have any further TLoC.  
 \*\*The timing of the follow-up is dependent on the storage on the device and the condition of the person.

**IF THE CAUSE REMAINS UNCERTAIN OR THE PERSON HAS NOT RESPONDED TO TREATMENT**

- Consider PNES or Psychogenic pseudo-syncope if a person has persistent TLoC and if, for example,
  - the nature of the event changes over time
  - there are multiple unexplained physical symptoms
  - there are unusually prolonged events
 Refer for neurological assessment
- Advise people who have experienced TLoC to try to record any future events (for example, a video recording or a detailed witness account of the event) particularly if the diagnosis is unclear or taking a history is difficult
- If, after further assessment the cause of TLoC remains uncertain or the person has not responded to treatment, consider other causes of TLoC, including the possibility that more than one pathology may co-exist, for example total arrhythmias

**DO NOT OFFER TILT TEST ONLY TO ASSESS WHETHER VASOVAGAL SYNCOPE IS ACCOMPANIED BY SEVERE CARDIOINHIBITORY RESPONSE (USUALLY ASYSTOLE).**

Consider tilt test only to assess whether vasovagal syncope is accompanied by severe cardioinhibitory response (usually asystole).

## ACUTE LEFT VENTRICULAR FAILURE

Recognition:

- Sudden onset of dyspnoea or sudden deterioration?
- Previous cardiac history?
- Pallor/sweating?
- Pulmonary crepitations?
- Hypotension/ clammy?

### Treatment

- Inform senior ED doctor immediately
- Consider arrhythmia or MI as cause – monitor, 12-lead ECG
- Give oxygen 100%\*
- **Diamorphine 2.5-5mg iv** +/- metoclopramide 10mg iv
- Administer **Furosemide 40-80 mg iv** (repeat if necessary)
- Consider iv **GTN** (only if SBP >110)
- Consider **CPAP** if respiratory distress
- Notify Cardiac doctor ASAP +/- ICU

## THROMBO-EMBOLIC DISEASE

- IT IS ESSENTIAL TO UNDERSTAND THE DIFFERENCES IN APPLICATION AND NORMAL RANGE BETWEEN D-DIMER TESTING FOR PULMONARY EMBOLISM AND DVT

### 1. Pulmonary Embolism

MASSIVE PULMONARY EMBOLISM IS A CLINICAL DIAGNOSIS MADE IN THE PRESENCE OF SHOCK, RIGHT HEART STRAIN AND SEVERE HYPOXIA WITH RISK FACTORS FOR THROMBOEMBOLIC DISEASE AND NO OBVIOUS ALTERNATIVE DIAGNOSIS (EG MI). GIVE O<sub>2</sub> via NRRM and CONSIDER IMMEDIATE LYSIS (PREFERABLY AFTER CARDIAC ECHO IN RESUS) – SEEK SENIOR ADVICE

Assessment for acute sub-massive pulmonary embolus follows the 'rule in-rule out' method outlined below. A scoring system devised by a team of Canadian physicians forms the basis for our assessment. Although this system incorporates D-dimer testing and is supported by diagnostic imaging, your clinical assessment of the likelihood of PE as opposed to some other diagnosis is crucial.

### **a) Step One: Clinical Assessment**

**History:** Acute pulmonary embolus is often a difficult diagnosis as signs are often non-specific or unreliable. Patients often complain of dyspnoea, pleuritic chest pain or collapse with shock in the absence of other causes.

97% of patients have one of the following

1. Dyspnoea
2. Tachypnoea (Respiratory rate >29/min)
3. Pleuritic chest pain

But you must consider if another diagnosis is more likely.

**Examination:** of the cardiovascular system, chest and legs may confirm your suspicion of PE but physical findings are more often useful in suggesting an alternative diagnosis (see below).

#### **Investigations:**

- **ECG:** should be taken, mainly to exclude acute MI or pericarditis. In PE tachycardia is the most common finding, non-specific ST-T wave abnormality is common, S1Q3T3 is rare.
- **PACXR:** should be also requested. Once again, it is often more helpful in identifying an alternative diagnosis such as pneumothorax, LVF or chest infection. It is normal in 10-20% of patients with PE (note that a normal CXR with hypoxia and significant dyspnoea supports a diagnosis of PE). Most of the remaining patients have non-specific findings like atelectasis / small effusion / elevated diaphragm, cardiomegaly. Occasionally, specific findings like a pulmonary infarct will be seen (wedge shaped, Hampton's hump) or an area of oligaemia identified distal to a dilated vessel (Westermark sign).
- **ABG / O<sub>2</sub> sat:** should always be measured. Low O<sub>2</sub> saturation or P<sub>O<sub>2</sub></sub> increases suspicion in the absence of alternative diagnosis but normal oxygenation does not exclude PE. Comparing ABGs with and without O<sub>2</sub> mask is not helpful.

### **b) Step Two: Measure Canadian Score**

Clinical features of DVT	3.0
Recent immobility or surgery	1.5
Active cancer	1.0
Hx of DVT / PE	1.5
Haemoptysis	1.0
Resting heart rate >100/min	1.5
PE <i>as likely as or more likely than</i> an alternative diagnosis	3.0

SCORE	Pre-test Probability of PE
<2	low
≥ 6	Medium to high risk

### **c) Step Three: Investigation to Rule In or Rule Out PE**

**RULE OUT:** Patients with a low pre-test probability score can have a d-dimer test to rule out PE. IF their D-Dimer is < **250ng/ml**, PE can be excluded and an alternative diagnosis should be sought.

**RULE IN:** Patients with a medium or high pre-test probability OR a D-dimer > **250mg/ml** will probably require radio-isotope scan or CTPA scan to rule in PE irrespective of D-dimer result. Stable patients with a low PESI score may be investigated in the Observation Ward. Patients with a high PESI score are high risk and should be admitted for investigation and management under the medical inpatient team.

### **d) Management**

All patients suspected of having a PE after the above assessment should be treated with **enoxaparin 1.5 mk/kg SC** (reduced in renal impairment as per BNF).

Next their PESI score should be calculated as an indication of risk of complications. Those patients with a PESI score of 85 or less can be investigated through the Observation Ward Pathway. Those with a PESI score higher than 85, a confirmed diagnosis of PE or clinical picture suggestive of a massive PE should be admitted under the respiratory team.

### **PESI Score**

Clinical indicator	Points
Age	+ age (in years)
Male sex	+ 10
Cancer	+ 30
Heart failure	+ 10
Chronic lung disease	+ 10
Pulse > 110 bpm	+ 20
Systolic BP < 100 mmHg	+ 30
Respiratory rate ≥ 30 breaths/min	+ 20
Temperature < 36 <sup>0</sup>	+ 20
Altered mental state	+ 60
Arterial saturation < 90%	+ 20

## **2. Acute Life Threatening Pulmonary Embolism**

**RESUSCITATION** — When a patient presents with suspected PE, the initial focus is on stabilizing the patient.

**Respiratory support** — Supplemental oxygen should be administered if hypoxemia exists. Severe hypoxemia or respiratory failure should prompt consideration of intubation and mechanical ventilation.

**Hemodynamic support** — Hemodynamic support should be instituted promptly when a patient presents with PE and hypotension, defined as a systolic blood pressure <90 mmHg or a drop in systolic blood pressure of  $\geq 40$  mmHg from baseline.

Intravenous fluid administration is first-line therapy. Clinicians should be wary of administering more than 500 to 1000 mL of normal saline during the initial resuscitation period.

If the patient's hypotension does not resolve with intravenous fluids, intravenous vasopressor therapy should promptly follow.

**THROMBOLYSIS** — Thrombolytic therapy accelerates the lysis of acute PE and improves important physiologic parameters, such as RV function and pulmonary perfusion. However, no clinical trial has been large enough to conclusively demonstrate a mortality benefit. Thrombolytic therapy is associated with an increased risk of major hemorrhage, defined as intracranial hemorrhage, retroperitoneal hemorrhage, or bleeding leading directly to death, hospitalization, or transfusion.

Persistent hypotension due to PE (ie, massive PE) is the most widely accepted indication for thrombolytic therapy.

**A 50 mg bolus of alteplase is recommended.**

### 3. Deep Venous Thrombosis

#### a) Step One: Canadian Score To Rule In Or Rule Out DVT

This scoring system accurately determines the pre-test probability of DVT. It is vital to consider alternative diagnoses as –2 points depend on whether another diagnosis is as likely as DVT

**A previous history of DVT or PE is deemed to be high risk**

Active Cancer	1
Paralysis/paresis or recent plaster immobilization of the lower extremities	1
Immobilization > 3 days or major surgery within four weeks	1
Localised tenderness along the distribution of the venous system	1
Entire Leg swelling	1
Calf swelling > 3cm when compared with the asymptomatic leg (measured 10cm below the tibial tubercle)	1
Pitting oedema greater in the symptomatic leg	1
Collateral superficial veins (non-varicose)	1
Alternative diagnosis <u>as likely</u> or more likely than DVT (Eg sudden onset – muscle tear, <i>prolonged CRT</i> – <i>arterial insufficiency</i> , OA knee – Baker's cyst, temp>38 –cellulitis)	-2

SCORE	INCIDENCE OF DVT	PROBABILITY
0	5%	VERY LOW (RULED OUT)
1-2	33%	MEDIUM
>2	85%	HIGH

#### b) Step Two: Investigations to Rule in or Rule Out DVT

Canadian Score	D-Dimer needed?	D-Dimer result	USS needed?	USS result
<b>Low risk</b>	No: DVT ruled out, consider other causes	-	No: DVT ruled out, consider other causes	-
<b>Medium risk</b>	Yes	D-Dimer <250 ng/ml	No: DVT ruled out, consider other causes	-
		D-Dimer >250 ng/ml	Yes: DVT not ruled out	1. USS negative: DVT ruled out 2. USS Positive: treat for DVT
<b>High Risk</b>	No	-	Yes	1. USS negative: DVT ruled out 2. USS positive: treat for DVT

**D-Dimer**

D-Dimer +/- USS should be performed on patients as per the table above. Other causes should be considered when DVT ruled out. The commonest mistake is to miss peripheral vascular disease – always record CRT. Also consider ruptured Baker's cyst, cellulitis, erythema nodosum, chronic venous insufficiency or lymphoedema. Diabetic patients with swollen red legs need soft tissue infection and underlying osteomyelitis to be considered.

**USS**

Patients requiring USS should have it booked according to the slots available in the USS appointment book (kept in minors). The slots are as follows:

Mon – Fri:	09.00	09.15	15.50
Sat – Sun:	09.30	10.30	

If a patient attends out of hours, book them into the next available slot in the book and send an e-request detailing the time given to the patient. Prescribe enoxaparin 1.5mg/kg daily until USS date. Remember to reduce the dose in renal failure. Arrange for the patient to self administer the enoxaparin (training is arranged with the pharmacist) or district nurse administration. Book patients in the DVT clinic on Symphony.

Admit medically if there is a contra-indication to community management with enoxaparin.

**c) Step Three: Management of definite DVT**

If community management is contra-indicated – admit medically.

**Contraindications to Community Management**

1. Ilio-femoral DVT is strongly suspected / grossly swollen limb, marked femoral vein tenderness, major risk factors, eg, metastatic disease.
2. Active peptic ulcer
3. Recent surgery
4. Pregnancy
5. Other bleeding risk
6. Symptoms of PE (SOB, haemoptysis, dizzy, chest pain)
7. BP>200 systolic or 115 diastolic
8. Currently on warfarin
9. Patient is very frail or ill (unless from a Nursing Home)
10. Dialysis patient / low clearance renal patient

If community management is not contraindicated:

1. Assess bleeding risk
2. Consider treatment with warfarin (enoxaparin 1.5 mg/kg\* daily until INR >2) or Rivaroxaban. Choice of agent will depend on the patient and their GP. Rivaroxaban is commenced as a single agent anticoagulant and is initially prescribed at 15mg BD for 2 weeks then 20 mg daily provided normal renal function.
3. Complete paperwork as found in the folder in Minors
4. Contact GP if commencing warfarin to ask if they will initial and monitor same (otherwise initiation arranged through the Observation Ward)
5. Arrange pharmacist to educate patient on use of new medication
6. Advise patient to re-attend if leg is not responding to treatment.

*\*NB dose reduction in renal impairment, seek senior advice*

**\*\*NEVER START WARFARIN ON AN EMERGENCY DEPARTMENT PATIENT YOURSELF UNDER ANY CIRCUMSTANCES. IF A GP IS UNWILLING TO WARFARINISE DISCUSS WITH EMERGENCY DEPARTMENT CONSULTANT**

**EMERGENCY DEPARTMENT DISCHARGE CHECKLIST FOR COMMUNITY  
MANAGEMENT OF DVT**

**Name** \_\_\_\_\_ **Address** \_\_\_\_\_

**Date of Birth** \_\_\_\_\_ **ED Number** \_\_\_\_\_

1. **Ultrasound Diagnosis: Thrombus in the**

**Femoral v**  **Popliteal v**  **Calf veins**

2. **Patient has no contra-indication to community treatment**

3. **Patients under 45 have had clinical examination to identify underlying cause of DVT**

4. **Patient has been advised to stop smoking, discontinue OCP etc**

5. **GP has been personally contacted and agrees to commence and monitor warfarin therapy**  **or the following arrangement has been made**

\_\_\_\_\_

6. **Nursing staff have dispensed sufficient Enoxaparin syringes for patient to have five days' treatment at dose prescribed by Emergency Department doctor**

7. **Nursing staff have spoken to community nurses and arranged daily administration of Clexane**

8. **Nursing staff have given patient Enoxaparin Information Sheet(for patient) and yellow warfarin book (for GP to use where appropriate)**

9. **Patient is advised by doctor to re-attend Emergency Department if symptoms have not improved within five days and this advice is recorded on flimsey**

10. **Emergency Department doctor has faxed this checklist to GP on day of diagnosis**

11. **Target INR**  2.5

12. **Recommended duration of treatment**

3months (calf vein only and after trauma) 6months(popliteal or femoral)

?lifelong (recurrent DVT)

**Signed** \_\_\_\_\_ **Emergency Department Doctor**

\_\_\_\_\_ **PRINT NAME**

***Always Fax this with EMERGENCY DEPARTMENT Department Fax Cover Sheet & then retain with flims***

**INTENTIONALLY BLANK**

## WARFARIN REVERSAL

See NHSCT guidelines for rapid reversal of warfarin coagulopathy in patients with life threatening haemorrhage

Patient needs:

- ABC
- IV line, FBP, coag, INR and Group and Save / X-match.
- Resuscitate as appropriate.

### **Indication**

Intracranial bleed

Retroperitoneal bleed

Intra-ocular bleed

Muscle bleed with compartment syndrome

Pericardial effusion

Active bleed with hypotension or 2g fall in Hb

Contact Consultant on-call

Contact Haematologist on-call

### **Prothrombin Complex Concentrate (PCC)**

PCC 30iu/Kg – INR >4

PCC 15iu/Kg – INR <4

Vitamin K 5mg IV

Check INR and APTT post infusion and at 4 hours.

If INR > 1.5 discuss with haematology.

PCC is relatively contra-indicated in DIC, acute liver failure and thrombosis.  
Discuss with Haematologist.

# NOVEL ORAL ANTICOAGULANT REVERSAL

## PATIENT RECEIVING RIVAROXABAN/APIXABAN THERAPY: HAEMORRHAGE PROTOCOL

**STOP: RIVAROXABAN/APIXABAN**

Contact Haematologist

Request:  
 1. Coagulation screen/ FBC/ G+H  
 2. AntiXa (apixaban)  
 3. Ascertain time of last dose of anticoagulant

Consider oral charcoal if ingestion < 5 hours)

MILD BLEED

MAJOR BLEED

LIFE THREATENING BLEED

- Mechanical compression
- Tranexamic Acid
  - oral 25 mg/kg
  - i.v. 10 mg/kg
- Delay next dose or discontinue treatment

Maintain BP and Urine Output

- Optimise tissue oxygenation
- Control haemorrhage
  - Compression
  - Surgical intervention
- Tranexamic Acid (10 mg/kg i.v.)
- Red Cell transfusion
  - Aim Hb > 85 g/l
- Platelet transfusion
  - Aim Plt > 75 x 10<sup>9</sup>/l or
  - If CNS bleed aim Plt > 100 x 10<sup>9</sup>/l

1<sup>st</sup> line: PCC 40 units/kg  
 2<sup>nd</sup> line: rFVIIa 90 micrograms/kg

Continues to bleed

**Major Bleed:** Symptomatic bleeding in a critical area or organ, such as intracranial, intraspinal, intraocular, retroperitoneal, intra-articular, pericardial or intramuscular with compartment syndrome (Schulman et al J Thromb Haemost 2010; 3:692-694)

## PATIENT RECEIVING RIVAROXABAN/APIXABAN THERAPY: OVERDOSE PROTOCOL

**STOP: Rivaroxaban/apixaban**

Contact Haematologist

Coagulation screen/FBC/G+H  
AntiXa (apixaban)  
Important to document time of last dose of anticoagulant

consider oral charcoal if ingestion &lt; 5 hours

Maintain BP and Urine Output

Is patient bleeding?

YES

Refer to  
haemorrhage protocol

NO

Continue routine observations,  
maintain high index of suspicion for bleeding potential

## ASTHMA (SEE BTS GUIDELINES NEXT PAGE)

### Signs of Severe asthma

- Unable to speak in sentences?
- Peak flow < 50% predicted or best?
- Respiratory Rate >25/min?
- Pulse >110/min?
- **SaO<sub>2</sub>** <92%?

### Features of a LIFE-THREATENING Attack

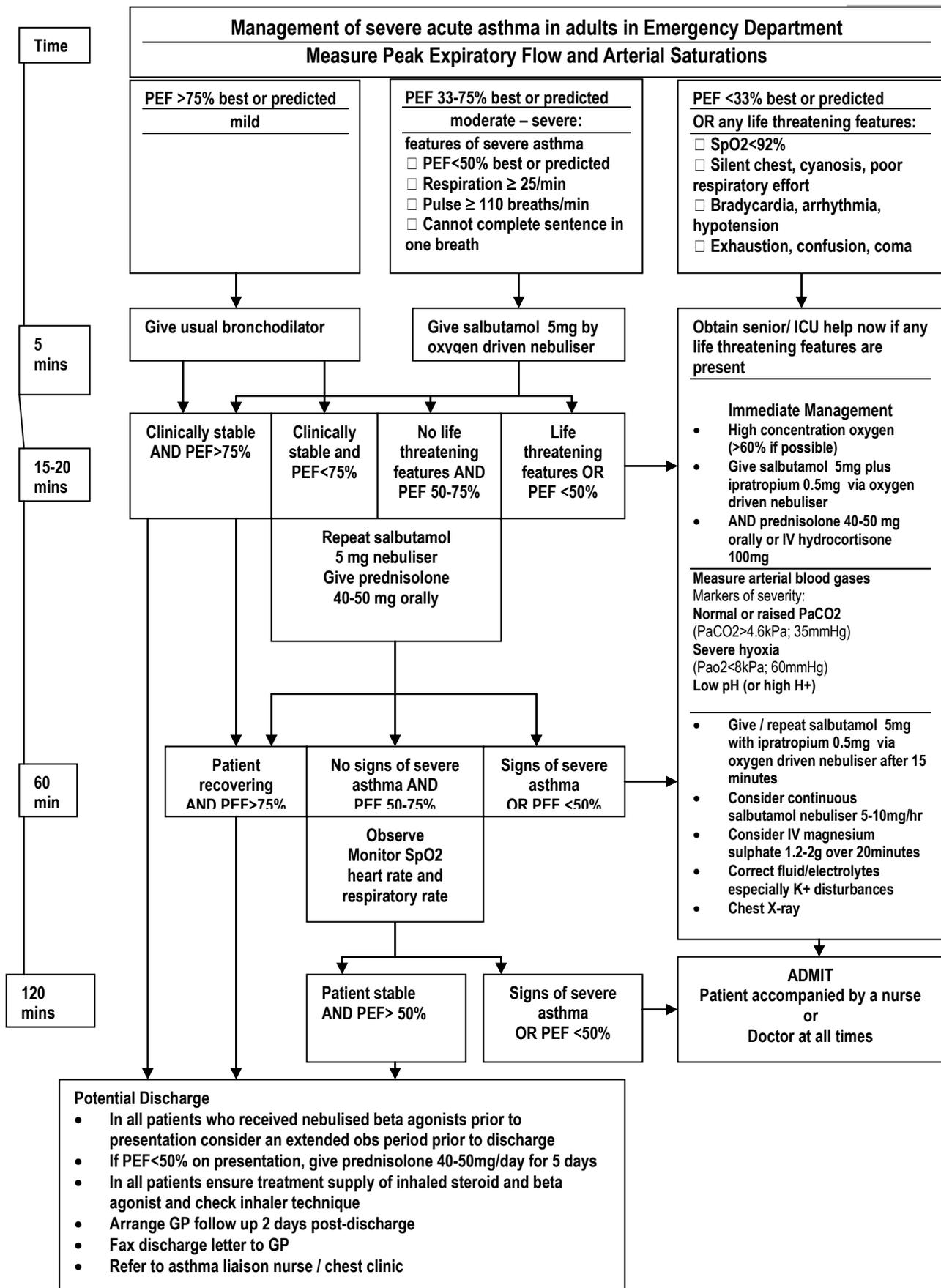
- Unable to speak?
- Silent chest, cyanosis, or feeble respiratory effort?
- Bradycardia or hypotension?
- Exhaustion, confusion, or coma?

### a) Clinical Assessment

- Exclude tension pneumothorax by palpitation of trachea and auscultation
- Check blood gas (normal or high PaCO<sub>2</sub> 36mmHg+; PO<sub>2</sub><60)
- Obtain urgent portable chest x-ray

### b) Treatment of severe & life-threatening attacks

- **Follow BTS guidelines (next page)**
- Immediately apply oxygen 100% by NRRM. Give continuously (including during x-ray)
- Give salbutamol 5mg with ipratropium 500mcg via nebulizer: repeat if necessary
- Obtain venous access
- Contact anaesthetist and medical registrar if signs of life-threatening asthma
- Send FBP, U&E, serum theophylline to laboratory (watch for hypokalaemia)
- Erect a 5% dextrose infusion and start Fluid Balance Chart
- Give Prednisolone 30mg orally (or hydrocortisone 200mg iv if unable to swallow)
- Give Oral Antibiotic (see Antibiotic Guidance) or iv if unable to swallow
- Consider Magnesium 1.2 - 2g iv infusion over 20 minutes
- Consider Aminophylline iv or Salbutamol iv if poor inspiratory effort
- **MONITOR CONTINUOUSLY**



## Management of acute severe asthma in adults in hospital

### Features of acute severe asthma

- Peak expiratory flow (PEF) 33-50% of best (use % predicted if recent best unknown)
- Can't complete sentences in one breath
- Respirations  $\geq 25$  breaths/min
- Pulse  $\geq 110$  beats/min
- Life threatening features**
- PEF <33% of best or predicted
- SpO<sub>2</sub> <92%
- Silent chest, cyanosis, or feeble respiratory effort
- Bradycardia, dysrhythmia, or hypotension
- Exhaustion, confusion, or coma

If a patient has any life threatening feature, measure arterial blood gases. No other investigations are needed for immediate management. Blood gas markers of a life threatening attack:

- Normal (4.6-6 kPa, 35-45 mmHg) PaCO<sub>2</sub>
- Severe hypoxia: PaCO<sub>2</sub> <8 kPa (60mmHg) irrespective of treatment with oxygen
- A low pH (or high H<sup>+</sup>)

**Caution: Patients with severe or life threatening attacks may not be distressed and may not have all these abnormalities. The presence of any should alert the doctor.**

### Near fatal asthma

- Raised PaCO<sub>2</sub>
- Requiring mechanical ventilation with raised inflation pressures

### Immediate Treatment

- Oxygen 40-60% (CO<sub>2</sub> retention is not usually aggravated by oxygen therapy in asthma)
- Salbutamol 5 mg or terbutaline 10 mg via an oxygen-driven nebuliser
- Ipratropium bromide 0.5 mg via an oxygen-driven nebuliser
- Prednisolone tablets 40-50 mg or IV hydrocortisone 100 mg or both if very ill
- No sedatives of any kind
- Chest X ray if pneumothorax or consolidation are suspected or patient requires mechanical ventilation
- IF LIFE THREATENING FEATURES ARE PRESENT:**
- Discuss with senior clinician and ICU team
- Add IV magnesium sulphate 1.2-2 g infusion over 20 minutes (unless already given)
- Give nebulised  $\beta_2$  agonist more frequently e.g. salbutamol 5 mg up to every 15-30 minutes or 10 mg continuously hourly

### Subsequent Management

**IF PATIENT IS IMPROVING continue:**

- 40-60% oxygen
- Prednisolone 40-50mg daily or IV hydrocortisone 100 mg 6 hourly
- Nebulised  $\beta_2$  agonist and ipratropium 4-6 hourly

**IF PATIENT NOT IMPROVING AFTER 15-30 MINUTES:**

- Continue oxygen and steroids
- Give nebulised  $\beta_2$  agonist more frequently e.g. salbutamol 5 mg up to every 15-30 minutes or 10 mg continuously hourly
- Continue ipratropium 0.5 mg 4-6 hourly until patient is improving

**IF PATIENT IS STILL NOT IMPROVING:**

- Discuss patient with senior clinician and ICU team
- IV magnesium sulphate 1.2-2 g over 20 minutes (unless already given)
- Senior clinician may consider use of IV  $\beta_2$  agonist or IV aminophylline or progression to mechanical ventilation

### Monitoring

Repeat measurement of PEF 15-30 minutes after starting treatment

- Oximetry: maintain SpO<sub>2</sub> >92%
- Repeat blood gas measurements within 2 hours of starting treatment if:
  - initial PaO<sub>2</sub> <8 kPa (60 mmHg) unless subsequent SpO<sub>2</sub> >92%
  - PaCO<sub>2</sub> normal or raised
  - patient deteriorates
- Chart PEF before and after giving  $\beta_2$  agonists and at least 4 times daily throughout hospital stay

Transfer to ICU accompanied by a doctor prepared to intubate if:

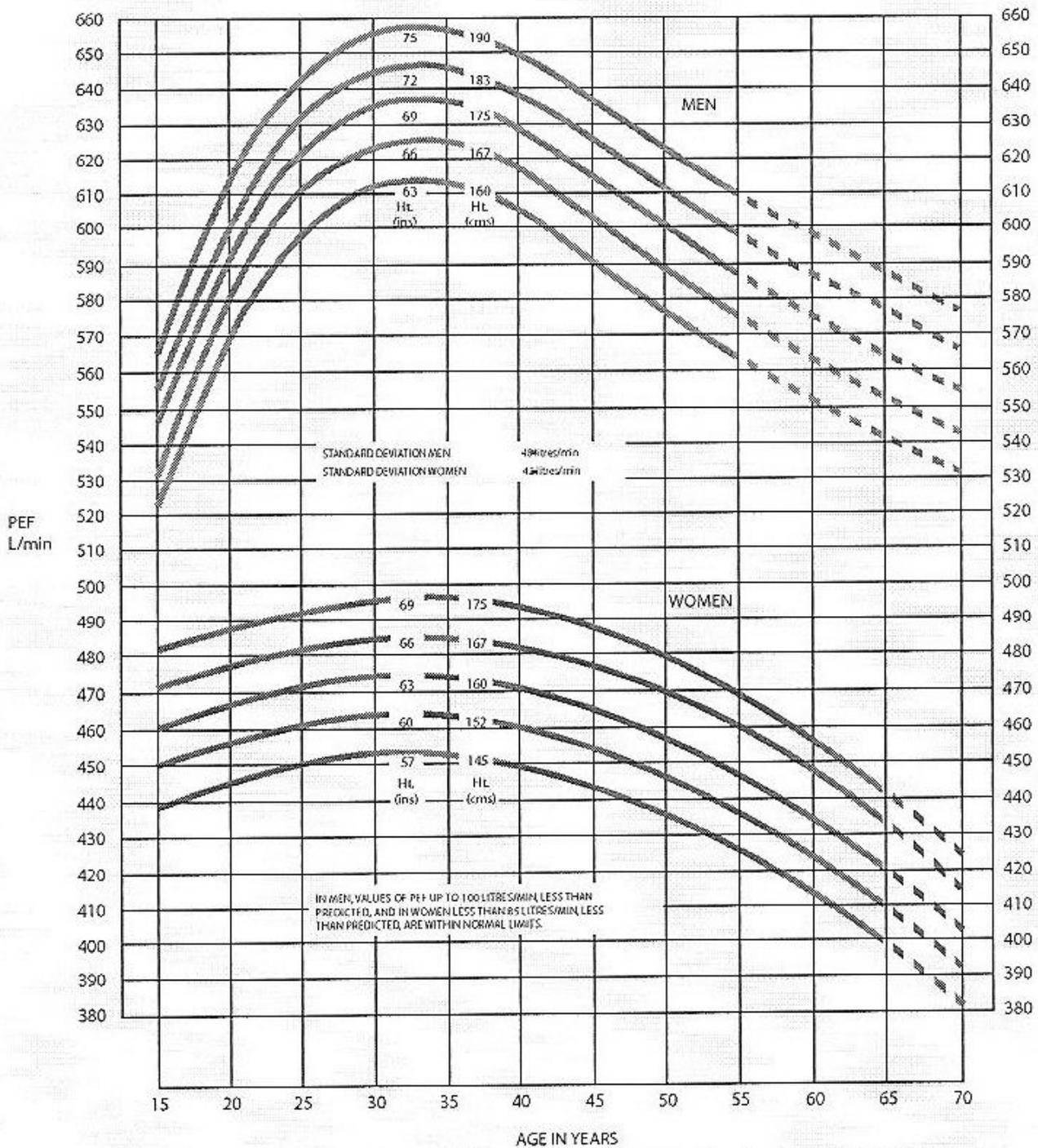
- Deteriorating PEF, worsening or persisting hypoxia, or hypercapnea
- Exhaustion, feeble respirations, confusion or drowsiness
- Coma or respiratory arrest

### Discharge

When discharged from hospital, patients should have:

- Been on discharge medication for 24 hours and have had inhaler technique checked and recorded
  - PEF >75% of best or predicted and PEF diurnal variability <25% unless discharge is agreed with respiratory physician
  - Treatment with oral and inhaled steroids in addition to bronchodilators
  - Own PEF meter and written asthma action plan
  - GP follow up arranged within 2 working days
  - Follow up appointment in respiratory clinic within 4 weeks
- Patients with severe asthma (indicated by need for admission) and adverse behavioural or psychosocial features are at risk of further severe or fatal attacks
- Determine reason(s) for exacerbation and admission
  - Send details of admission, discharge and potential best PEF to GP

# Peak expiratory flow in normal adults



Nunn AJ, Gregg I. New regression equations for predicting peak expiratory flow in adults. *BMJ* 1989;298:1068-70.

### **c) Treatment for Mild and Moderate asthma attacks**

Asthma is a dangerous condition and special care must be taken when you decide to discharge a patient who has presented with symptoms of exacerbation. There is “step up” guidance in the BNF.

- All patients attending the Emergency Department must be given inhaled or nebulized beta-agonists and have their peak expiratory flow rate (PEFR) re-checked 15-30 minutes later. Pre- and post- PEFR to be recorded in notes.
- Patients may be considered for discharge if PEFR is greater than 60% of best or predicted value following treatment, *and* stable or improving
- Usual treatment should be stepped up (see BNF).
- A “rescue” course of steroids should be prescribed particularly if initial PEFR was less than 60% of best/predicted value).
  - adults: 30-60 mg prednisolone for 3 days (to be stopped or stepped down by GP)
  - children: Prednisolone Soluble 1mg/kg for 1-5 days
- Patient must be reviewed by their GP or asthma nurse within 48 hours of Emergency Department attendance. Notes to document what to do if they worsen.
- Send a letter to the Respiratory nurse team to ensure follow up.

## **CHEST INFECTION**

- *Be mindful of respiratory infections during epidemics such as SARS or flu epidemics (e.g. swine flu). Follow current departmental guidance regarding this. In particular take measures to reduce spread of infection (see pag 103 for example)*

### **Wash Hands - Clean Surfaces - Limit Contact**

Use oral therapy unless patients are unable to tolerate fluids. Where possible decide what your patient is suffering from before choosing an antibiotic:

- **Upper respiratory tract infection**
- **Infective exacerbation of COPD**
- **Lobar pneumonia**
- **Bronchopneumonia**

The pneumonias are characterised by the presence of consolidation – this should be visible on x-ray. Patients with bronchopneumonia generally require admission

for supportive therapy. Patients with lobar pneumonia are often young and can be managed at home if there are no poor prognostic indications or complications.

Don't forget to consider atypical pathogens such as varicella, pneumocystis, TB, Legionella and psittacosis in patients who are severely ill.

### **CURB 65 scoring**

**Confusion\***      **Urea >7**      **Resp. rate >30**      **BP (Systolic <90; Diastolic <60)**      **Age > 65**

Score 1 point for each feature present

Score 0-1 likely suitable for home treatment

Score 2 consider hospital treatment

Pneumonia has a poor prognosis if 3 or more apply. If 4 or 5 assess for ICU

\*defined as a Mental Test Score of  $\leq 8$ , or new disorientation in person, place or time.

## **CHRONIC OBSTRUCTIVE PULMONARY DISEASE (SEE ALSO CHEST INFECTION)**

### **Diagnosis of exacerbation of COPD:**

- History of “winter” productive cough
- Decrease in exercise tolerance
- Change in colour or volume of sputum

### **Management**

- Give 28% oxygen by facemask
- Monitor SaO<sub>2</sub>, pulse and resp.onsiveness
- Check ABG at T=0 and T=30mins and adjust O<sub>2</sub> strength accordingly
- Give nebulised bronchodilators and repeat if necessary
- Give Prednisilone 30mg orally
- Give oral antibiotics (iv if not tolerating fluids) Amoxicillin 1g 8 hrly PO 5-7 days  
If previous recent antibiotic: Doxycycline 100mg 12 hrly PO OR Clarithromycin 500mg 12 hrly PO 5-7 days
- Start a fluid balance chart and erect iv fluids if poor oral intake

Consider the following table (Table 1) when determining a management plan for the patient.

Table 1. Factors to consider when deciding where to manage exacerbations		
	Treat at home?	Treat in hospital?
Able to cope at home	Yes	No
Breathlessness	Mild	Severe
General condition	Good	Poor/deteriorating
Level of activity	Good	Poor/confined to bed
Cyanosis	No	Yes
Worsening peripheral oedema	No	Yes
Level of consciousness	Normal	Impaired
Already receiving LTOT	No	Yes
Social circumstances	Good	Living alone/not coping
Acute confusion	No	Yes
Rapid rate of onset	No	Yes
Significant comorbidity (particularly cardiac disease and insulin-dependent diabetes)	No	Yes
SaO <sub>2</sub> < 90%	No	Yes
Changes on chest X-ray	No	Present
Arterial pH level	≥ 7.35	< 7.35
Arterial PaO <sub>2</sub>	≥ 7 kPa	< 7 kPa

There are three options for managing patients with COPD exacerbation.

### 1. Medical admission – under respiratory team

### 2. Home with Respiratory Enhanced Discharge Scheme (REDS) See table 2

- Mon-Fri, 9am-5pm.  
Contact respiratory nurse specialist ext. 334930, bleep 5727

Table 2. Criteria for REDS
Exacerbation of COPD
No Acute Hypercapnoeic Respiratory Failure (AHRF)
No consolidation on CXR
No <i>new</i> requirement for oxygen
OR SaO <sub>2</sub> >90% on usual flow of oxygen if on LTOT

### 3. Home (send a letter to respiratory nurse specialist on discharge)

- Arrange appropriate review (GP, community respiratory team)
- Give clear instructions on correct use of medication and stopping corticosteroid therapy

**COPD, Hypercapnia and Oxygen:**

- All patients who require medically-supervised resuscitation should receive 100% oxygen via non-rebreather reservoir mask (NRRM). Oxygen MUST be prescribed on the ED flimsy / drug kardex.
- After the immediate resuscitation period, continuous oxygen therapy should only be given when prescribed by a doctor. The prescription should include the concentration of oxygen to be administered. Empirical starting concentration for clinically hypercapnic patients should be 28%. All should have  $FiO_2$  adjusted after ABG check 30 mins later –aim for  $PO_2 >8$  and  $PCO_2 < 7.5$
- *Hypercapnia is characterised by altered level of consciousness/drowsiness, muscle twitching or tremor (this can be very marked), and reduced rate or depth of **respiration**. In COPD patients it will usually be associated with cyanosis caused by concomitant hypoxia.*
- Refer COPD patients with pH of 7.35 –7.25 to medical team re non-invasive ventilation. Patients with profound acidosis (pH<7.25) may require anaesthetic assessment regarding intubation and ventilation.
- Asthmatic patients must receive 100% oxygen by NRRM.
- Hypoxic or hypercarbic patients must have frequent clinical assessment blood gas monitoring.

**NON-INVASIVE VENTILATION (NIV)****a) When to use non-invasive ventilation****1. Patients**

- COPD
- Cardiogenic pulmonary oedema unresponsive to CPAP
- Chest wall deformity, neuromuscular disorder, decompensated OSA

**2. Blood gases**

- Respiratory acidosis ( $PaCO_2 >6.0$  kPa, pH <7.35 or  $H^+ >45$  nmol/l) which persists despite maximal medical treatment and appropriate controlled oxygen therapy (patients with pH <7.25 or  $H^+ >56$  nmol/l respond less well and should be managed in an HDU/ICU).
- Low A–a oxygen gradient (patients with severe life threatening hypoxaemia are more appropriately managed by tracheal intubation).

**3. Clinical state**

- Sick but not moribund, few co-morbidities
- Able to protect airway, conscious and co-operative
- Haemodynamically stable
- No excessive respiratory secretions

**b) Contraindications / Exclusions****1. Premorbid state**

- Potential for recovery to quality of life acceptable to the patient
- Patient's wishes considered

**2. Contraindications to NIV**

- Facial trauma/burns
- Recent facial, upper airway, or upper gastrointestinal tract\* surgery
- Fixed obstruction of the upper airway
- Inability to protect airway\*
- Life threatening hypoxaemia\*
- Haemodynamic instability\*
- Severe co-morbidity\*
- Impaired consciousness\*
- Confusion/agitation\*
- Vomiting
- Bowel obstruction\*
- Copious respiratory secretions\*
- Focal consolidation on chest radiograph\*
- Un-drained pneumothorax\*

\*NIV may be used, despite the presence of these contraindications, if it is to be the "ceiling" of treatment

**c) Management of Patients in Respiratory Failure**

1. Each patient should have an Arterial Blood Gas (ABG) if:
  - SpO<sub>2</sub> <93% Room Air
  - Abnormal Respiratory Rate
  - History of domiciliary Oxygen use
  - History of NIAS administered O<sub>2</sub> in transit to the ED
2. The concentration of Oxygen should be clearly documented.
3. CXR interpretation should be documented in the notes.
4. A repeat ABG should be checked 30 minutes after the first ABG of pH <7.35 and PaCO<sub>2</sub> > 6.5kPa
5. Referral for NIV should be made for
  - COPD patients with persistent respiratory acidosis.
  - LVF patients with pulmonary oedema and low saturations.



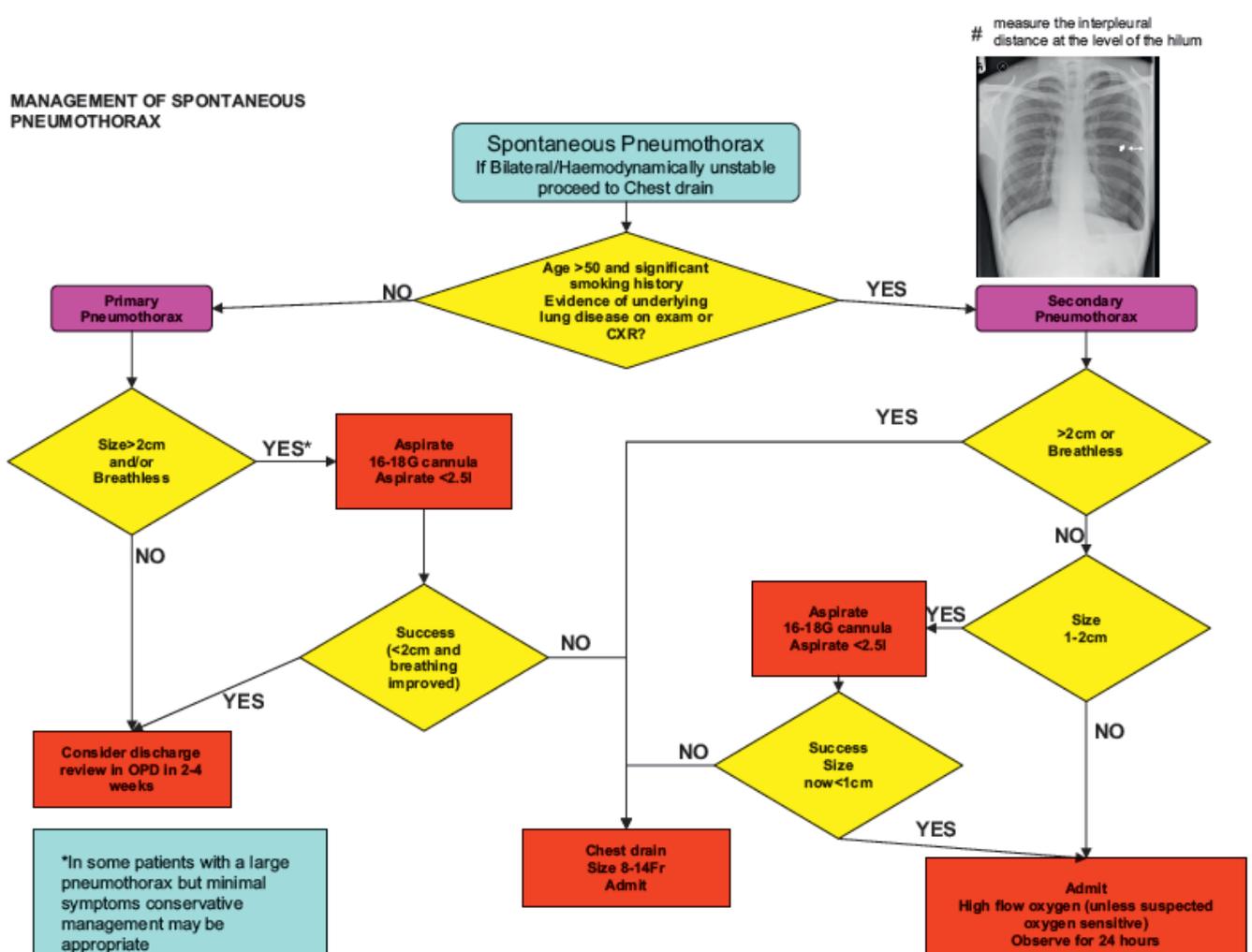
# PNEUMOTHORAX

**Tension pneumothorax** is a life-threatening emergency diagnosed clinically in a rapidly deteriorating breathless patient with jugular venous distension, tracheal shift, absent breath sounds and a thready pulse. It requires immediate release by inserting a brown venflon into the second inter-costal space mid-clavicular line (ideally using the set-up for pleural aspiration described on the following pages) followed by immediate insertion of a chest drain into the fifth inter-costal space mid-axillary line prior to x-ray.

## 1. Traumatic pneumothorax

This is the term used for any pneumothorax of whatever size that follows injury to the chest. Patients with chest trauma and sub-optimal x-rays should usually have chest drains prior to IPPV. Refer to ATLS guidelines regarding management.

## 2. Spontaneous pneumothorax



## **BTS Guidelines for Management of Spontaneous Pneumothorax**

### **a) Primary Spontaneous Pneumothorax**

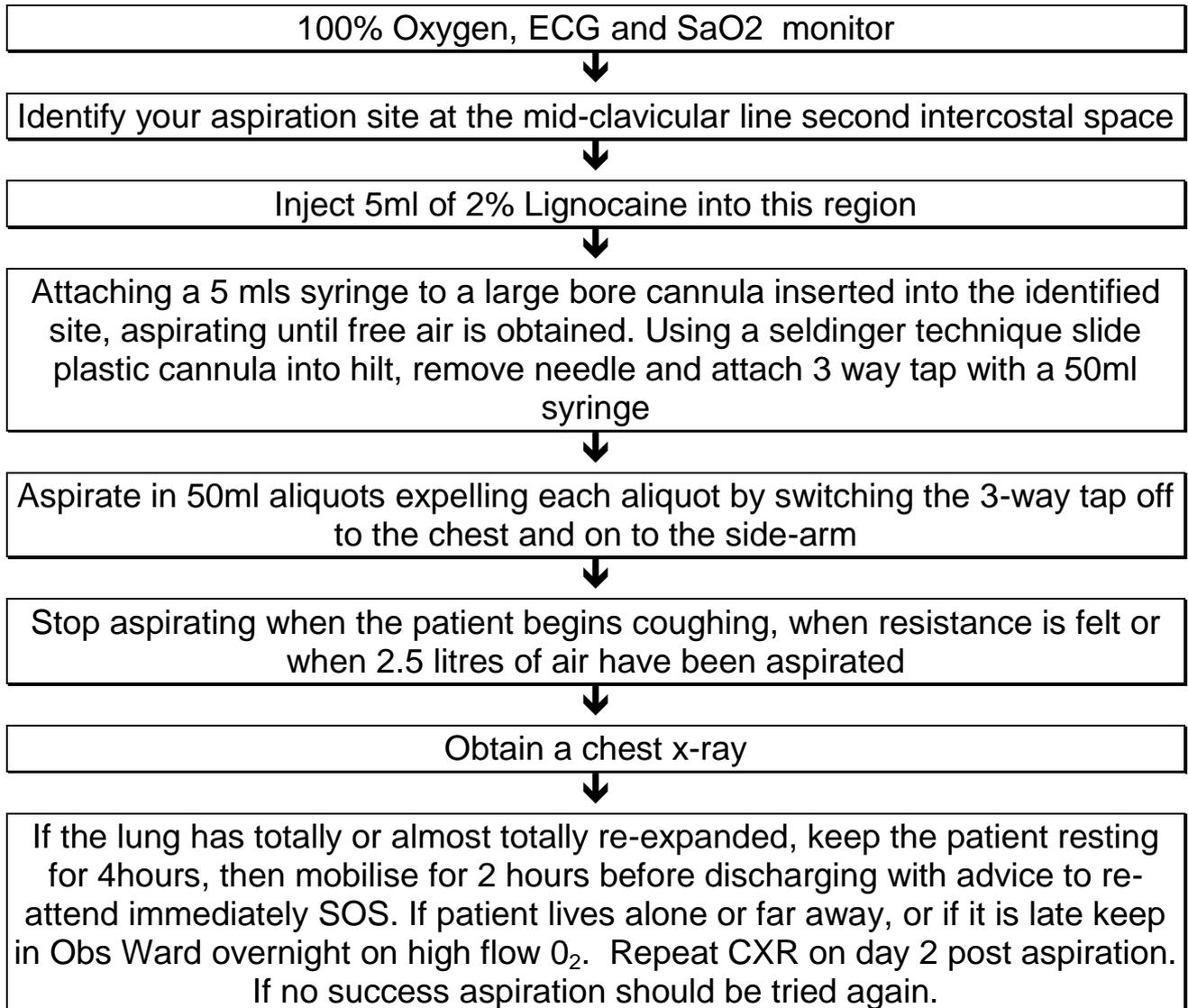
This is the term used for a non-traumatic pneumothorax in a patient with no pre-existing lung disease.

Most cases are suitable for wait-and-see management or aspiration *and this is the treatment of choice for such patients*. Tell the patient that aspiration has a 70% success rate – i.e. they might still need a chest drain. All patients discharged home from the ED whether treated conservatively or by aspiration should re-attend the ED after 48 hours for their first follow-up chest x-ray. It is essential that they rest during this initial period and that they fully understand the importance of returning immediately in the event of any deterioration.

**INSERTION OF A CHEST DRAIN IS NOT FIRST LINE TREATMENT FOR PRIMARY SPONTANEOUS PNEUMOTHORAX. DO NOT PERFORM FOR THIS INDICATION WITHOUT SENIOR EMERGENCY DEPARTMENT ADVICE.**

## **Aspiration Technique for Management of Primary Pneumothorax**

*Only to be undertaken if you are able to insert a chest drain in the event of a sudden deterioration in the patient's condition*



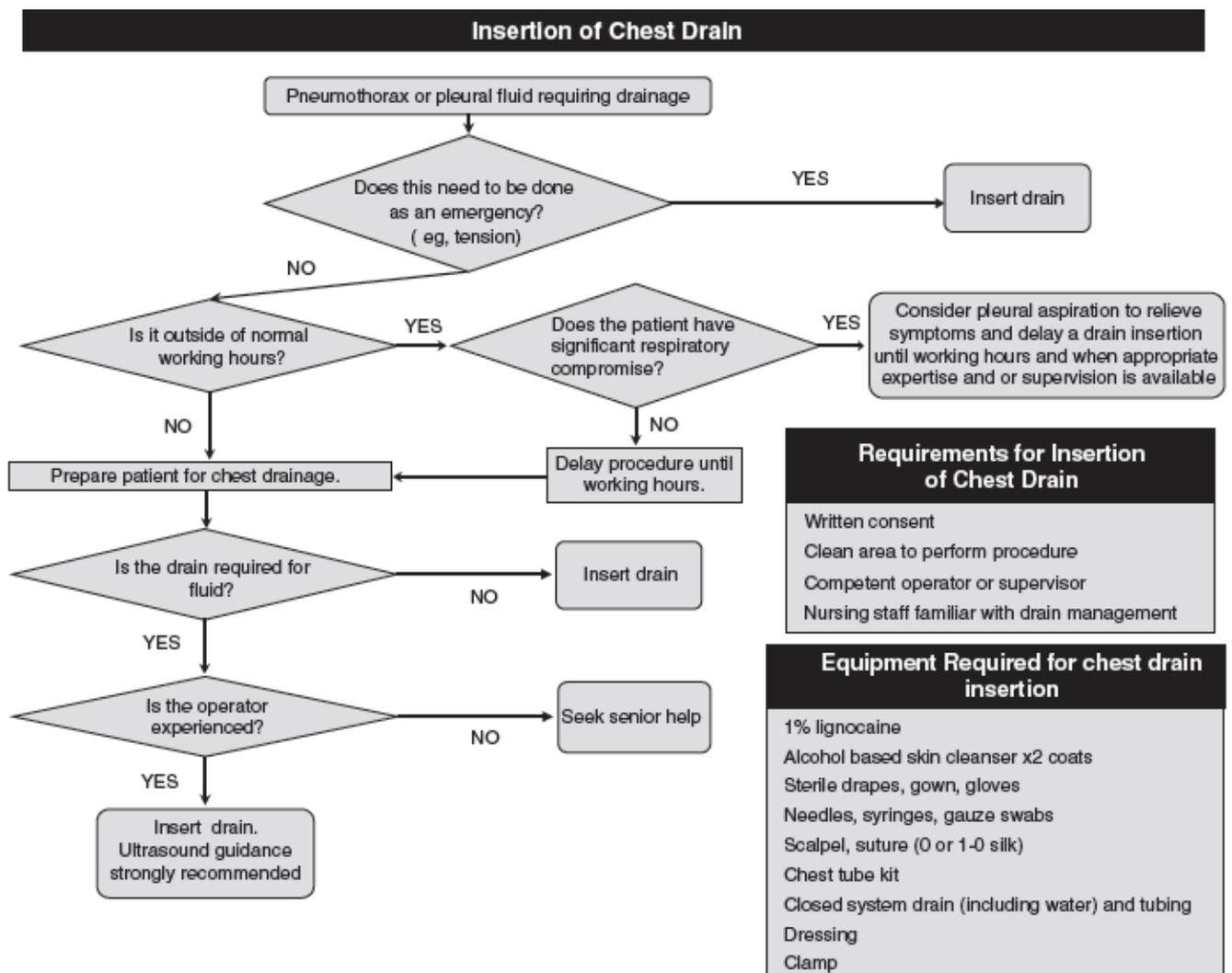
\*PRIMARY SPONTANEOUS PNEUMOTHORACES WITH A RIM OF AIR LESS THAN 2cm ON CXR DO NOT REQUIRE ASPIRATION OR ADMISSION. THEY STILL REQUIRE FOLLOW UP CXR DAY 2.

### **Discharge Advice**

On discharge, strong emphasis on smoking cessation. It is important to avoid air travel for 1/52 after CXR has shown resolution. Abstain from underwater diving for life.

## **b. Secondary\* Spontaneous Pneumothorax**

This is the term used for a non-traumatic pneumothorax in a patient with pre-existing lung disease, e.g. COPD or asthma. All such patients require admission and some form of intervention. First line is insertion of small bore chest drain. Chest drain insertion in stable patients with a secondary pneumothorax may be left until in hours as per BTS guidelines. All patients with a secondary spontaneous pneumothorax **MUST** be admitted under the respiratory team. **DO NOT** discharge home.



## ABDOMINAL PAIN (SEE ALSO ABDOMINAL AORTIC ANEURYSM)

Evaluating abdominal pain is difficult – misdiagnosis of this symptom generates more formal complaints than any other clinical mistake made in our department. Did you know that computers are better at diagnosing abdominal pain than doctors? This is because the computer follows a rigid system of history-taking and interprets physical signs in the light of this. You need to take a medical student history – no short cuts! Blood tests and x-rays are less important than history and examination. Abdominal x-ray has a limited role – see section one.

When you have made your diagnosis you have two options

- Admit to surgical / gynae ward
- Discharge with a meticulous recorded disposal plan (see General Information Section)

All patients with acute abdomen should be fasted and have IV fluids prescribed.

This is not an exhaustive list but these are useful things to remember:

- **Diabetes** + Abdominal Pain: ECG & Admit
- **AAA**: See previous section
- **Perforated Peptic Ulcer**: Unable to get comfortable or severe pain that settles very quickly. Can become asymptomatic but still leaking. Erect CXR is mandatory but up to 50% may have no free air especially if history is short.
- **Ectopic pregnancy**: Child-bearing age and positive urinary HCG and serum HCG
- **Ovarian Cyst**: Usually not pathological but cyclical pain may be due to ovarian cyst so recommend GP review to refer to gynae OPD. If abdominal signs consider referring to Gynae. Always do HCG.
- **Constipation**: Not acutely painful. Don't forget bowel cancer as a cause of altered bowel habit – GP review to refer to Surgical OPD. X-RAYS NOT INDICATED!
- **Biliary Colic**: RUQ pain but no signs. Can be discharged if settles with analgesia. WCC, amylase and temp will be normal. GP review. *Don't forget to exclude pancreatitis!*
- **Pancreatitis**: These patients can be very sick (or occasionally surprisingly well!). Vomiting is common. Check amylase but will be normal in around

6% of cases. Check ECG & blood glucose. Vigorous resuscitation and early senior surgical opinion.

- **Appendicitis:** History is the key but presentation may be atypical in the over 50s. (Can have leucocytes and haematuria on urine dipstick)
- **Ischaemic Colitis:** Usually very sick elderly patients with severe abdominal pain, shock, ileus– often with history of IHD etc. Pain relief ++, ECG and early surgical advice. Have a very high lactate level.
- **Toxic Megacolon:** All patients with history of inflammatory bowel disease, abdominal pain and any alteration of vital signs require surgical assessment/ admission. AXR. Resuscitate++ and get help.
- **Shingles:** Pain days before rash. Dermatomal distribution and dysaesthesiae are clues. You will feel very clever if you diagnose this before the rash appears!

## GI BLEEDING AND SHOCK

Use the guidelines given below to help you devise a management plan.

### 1. Patients may require “immediate” endoscopy if

- Ongoing bleeding and haemodynamically unstable

### 2. Patients may require endoscopy “soon” if

- Suspected varices (see next page)
- aged > 60
- clinical signs of shock (compensated or uncompensated)
- recurrent bleeding.

Fast patient, give O<sub>2</sub> via NRRM, monitor and give iv protium. Notify Medical SHO (and surgical registrar if no GI physician on call) at once

### Patients need admission under GI team if ANY of the following apply:-

- they have had proven haematemesis in the past or ED
- they describe any episode of faintness or dizziness since the onset of haematemesis
- melaena is found on rectal examination
- haemoglobin < 12 gd/L
- urea > 8 mmol/L
- underlying liver or cardiac disease
- evidence of coagulation defect (including anticoagulant medication)

Patients may be considered for outpatient endoscopy referral if there is a strong suspicion of a relatively minor haematemesis, and they are otherwise well with adequate home circumstances. Dispense a PPI and suggest this to the GP.

## MANAGEMENT OF VARICEAL BLEED

### 1. Get senior help – senior ED consultant + medical SPR +/- surgical SPR

### 2. Resuscitation

- Insert two 16g peripheral cannulae
- Check FBP, U+E, LFTs, Coagulation screen, Cross match 6U blood
- Consider intubation if there is evidence of severe encephalopathy, inability to maintain O<sub>2</sub> sat >90%, uncontrolled bleeding or aspiration. Also consider central venous access in such circumstances
- Catheterise to monitor urine output
- Start iv Tazocin

### 3. Fluid management

- Blood transfusion, aim for Hb 10 g/dl (no higher)
- Give FFP if PT >18sec and give platelets if platelet count <60,000
- If no blood is available use colloids (i.e. 1 litre of Haemaccel to begin with) +/- 5% dextrose in preference to 0.9% normal saline if ascites present
- If fluid retention is present consider 20% salt poor albumen
- Aim for CVP 5-10mmHg (if central line present)

### 4. Endoscopy

- OGD should be performed when patient is haemodynamically stable
- Variceal banding is treatment of choice for oesophageal varices
- Contact GI consultant via switchboard
- If neither gastroenterologist is available contact surgical SpR

### 5. Vasoconstrictors

- Give stat dose of terlipressin (Glypressin) as a 2mg iv bolus
- Glypressin is then given 1-2mg, 4-6 hourly for up to 48 hrs

### 6. Sengstaken-Blakemore tube may be necessary if there is uncontrolled bleeding or endoscopy is unavailable:

- Pass tube orally
- Confirm tube is in stomach by aspiration and auscultation
- Inflate gastric balloon with 250mls WATER
- Secure tube at side of mouth with balloon pulled up against gastric fundus. (Beware of pulling tube into oesophagus. Use X-ray to confirm position if necessary)

- Oesophageal balloon is rarely needed (<10%). If required it should be inflated to 20-30mmHg and deflated for 5mins every hour.
- Maintain aspiration of oesophagus and stomach via appropriate ports.

## ACUTE RETENTION OF URINE

- *A proper discharge plan is vital if community treatment planned!*
- *Always record residual volume and check PSA*

### Three questions about managing AUR:

#### **1. Can the patient be managed at home?**

Yes if:

- under 75,
- reasonable general health,
- happy to be discharged (or to take a nursing home place),
- no more than 1000mls residual urine.

#### **2. Should I arrange a trial without catheter (TWOC) before discharge?**

Yes if:

- residual was less than 600mls
- and there was an obvious cause of this episode (e.g. binge drinking)

#### **3. Should I arrange a trial without catheter (TWOC) after discharge?**

Yes if:

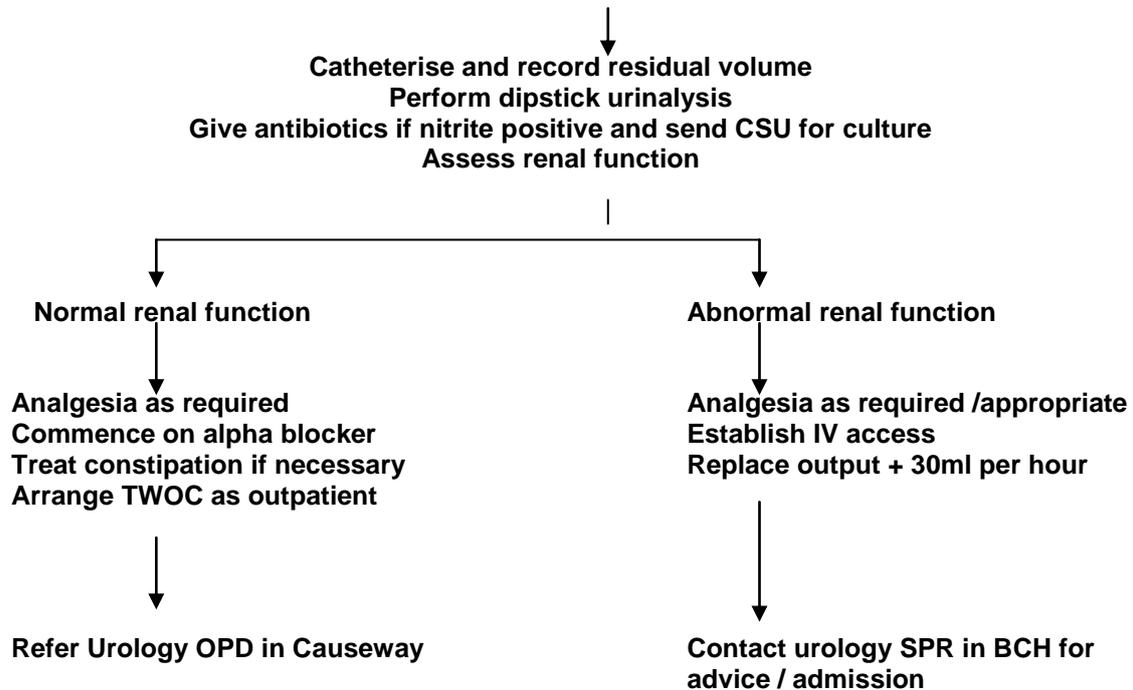
- there was a temporary reason for this episode, e.g. UTI, drinking binge, long wait to get to the toilet
- and patient did not have marked prostatic symptoms prior to episode.

**Tamsulosin 400mcg daily** reduces recurrence so it should be prescribed if there are no contra-indications – first dose can be given in Emergency Department (see BNF).

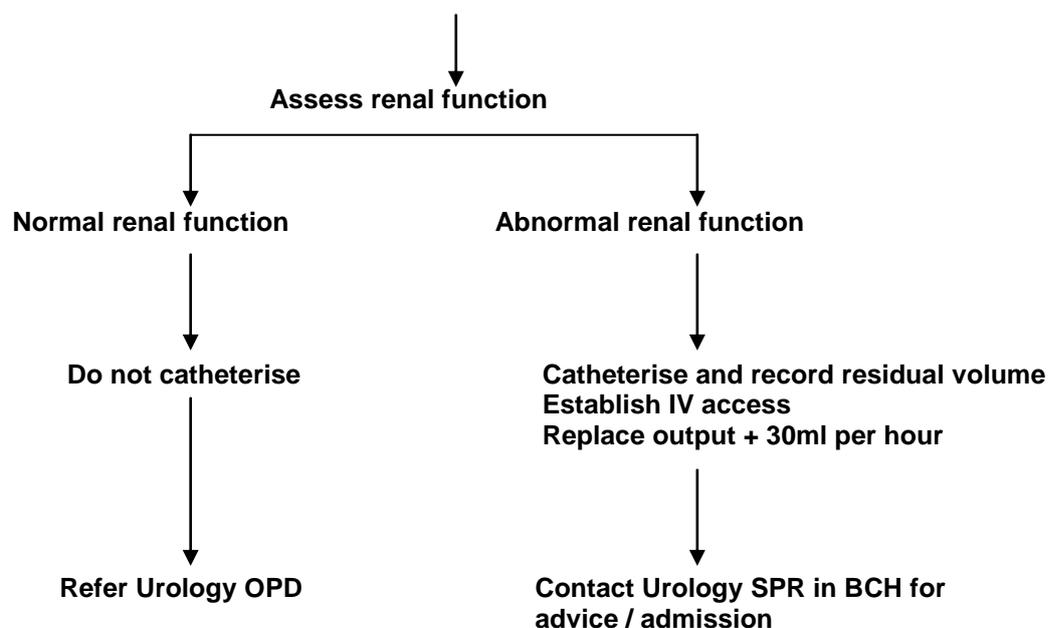
If the patient is discharged with a catheter in you must make very secure follow-up arrangements with him - usually by referring to the Hospital Diversion Team or District Nurse. One of our advice leaflets about catheter care must be given to the patient. Advise the patient to contact their GP to arrange urology follow-up. Management plan must be carefully outlined on flimsey and the GP letter.

- *Acute urology service is provided by Belfast City Hospital (#6124)*
- *Routine outpatient service is provided by Causeway Hosptial*

### Management of patients with painful urinary retention



### Management of patients with painless urinary retention



## RENAL COLIC

- *Patients with renal colic need to have their temperature, urinalysis, abdominal signs and KUB recorded.*
- *Diclofenac is usually the analgesic of choice.*
- *Reconsider the diagnosis if there is no haematuria.*

### Management

1. Bloods: FBC and renal function
2. Urinalysis:
  - a) **Nitrates** if nitrate positive send MSSU and commence on antibiotics  
If nitrate negative no need for antibiotics
  - b) **Blood** arrange for CT KUB
3. Admit to BCH Urology if complete obstruction, pain not controlled or signs of sepsis
4. Refer to BCH Urology as outpatient stone clinic if only partial obstruction with good pain control, no signs of sepsis and no renal impairment. Commence on tamsulosin.
5. If CT KUB negative, consider other causes of abdominal pain. Remember to exclude AAA.

### Admission to Observation Ward or surgery

- Severe pain persists despite adequate analgesia
- UTI
- Stone >6mm on KUB plain film
- Single Functioning Kidney
- Diagnosis in doubt (but first rule out AAA in any patient if first presenting age >55 years)
- Frail/ very elderly

## MANAGEMENT OF PATIENTS WITH FRANK HAEMATURIA

Record pulse and blood pressure

Perform dipstick urinalysis

Send MSSU if nitrite positive and commence on appropriate antibiotic

Perform full blood picture and renal function tests



Catheterise with 3-way catheter if there is evidence of clot retention or patient is experiencing difficulty passing large clots.

Record residual volume and commence bladder irrigation with saline.



### Refer to haematuria clinic if:

- Patient not anaemic
- Patient haemodynamically stable
- No signs of sepsis
- Irrigating catheter not required

### Admit if:

- Patient is anaemic
- Patient is haemo-dynamically unstable
- Patient is septic
- Irrigating catheter required
- Patient on anticoagulant therapy

## TESTICULAR PAIN

- *Testicular pain is a common presentation to the Emergency Department. Testicular torsion should be considered in the differential diagnosis of any male presenting with abdominal pain. Boys and learning-disabled young men are at special risk of occult torsion.*

	<b>Testicular torsion</b>	<b>Epididymo-orchitis</b>
<b>Pain</b>	Acute onset 20-30% have abdominal pain	Develops gradually
<b>Age range</b>	Pubescent boys Can affect neonates and adults	Post-pubescent 19-40 Can affect younger and older
<b>History</b>	Acute onset 50% report one episode of self resolving pain	Sexual activity Urethral instrumentation UTI
<b>Urinary symptoms</b>	90% urine NAD	Dysuria / frequency Pyuria present in most
<b>On palpation</b>	Testis enlarged, exquisitely tender Unable to distinguish epididymis Testis high riding and horizontal lie	Possible to distinguish the epididymis from the testis. Epididymis is often enlarged and early on tenderness is localised.
<b>Cremasteric reflex</b>	Absent in most	Present
<b>Prehn's test</b>	Elevation of scrotum does <u>not</u> relieve pain	Elevation of scrotum does relieve pain

### Mangement

- ***Testicular torsion is a surgical emergency and requires immediate referral to the surgical team on-call.***
- Epididymo-orchitis requires appropriate antibiotics and analgesia. Admission may be required for toxic patients or for analgesia.
- A normal USS of testes does not exclude torsion. Self resolving intermittent torsion may look like epididymo-orchitis on USS
- Late-presenting torsion mimics epididymo-orchitis – request surgical opinion if pain had sudden severe onset of symptoms

## ADVICE FOR ED DOCTORS REGARDING RENAL PATIENTS

If a patient is known to the renal team and presents with a complication relating to their renal illness, contact the renal team (renal registrar or consultant) via switchboard. Especially if

- Haemodialysis patient with fluid overload, hyperkalaemia or haemodialysis line sepsis
- Peritoneal dialysis patient with peritonitis or inability to perform dialysis
- Transplant patient with opportunistic infection or where immunosuppression prescription is being altered.

Out of hours, if no renal physician is on call, consider contacting the renal registrar on-call at the regional nephrology unit in BCH.

## HAEMOLYSIS IN PATIENTS ON HAEMODIALYSIS IN NORTHERN IRELAND

A number of patients have become unwell immediately after haemodialysis in 3 of the 6 dialysis units in Northern Ireland.

Testing showed evidence of haemolysis. It is unclear which part of the dialysis process may have caused this issue. It may cause symptoms during the dialysis process or not become apparent for up to 12 hours after the treatment.

Increased vigilance for this condition is essential and all haemodialysis patients have been given information on what to be alert to.

***One of the consequences of this form of haemolysis may be life threatening hyperkalaemia or hypoxia that requires urgent intervention.***

### **Symptoms or Signs of Dialysis related haemolysis:**

- Feeling non-specifically unwell
- Chest or abdominal pain
- Nausea and vomiting
- Itch, flushing, shivering,
- A rise in blood pressure
- Visible change in blood in dialysis tubing

## **What to do with a case of suspected haemolysis**

If a patient with chronic renal failure presents with symptoms that started within approximately 12 hours of a haemodialysis treatment, haemolysis should be considered as a possible diagnosis.

In addition to the standard assessment and initial management the following action should be taken.

- An evaluation for suspected hyperkalaemia (as per GAIN guidelines) – an ECG and cardiac monitoring will be necessary
- Take samples of blood for
  - Electrolytes including potassium
  - CBC specifying also that a blood film is required.
  - LDH
  - Haptoglobin levels
  - Haemolytic index (10 ml clotted sample).
  - Coombs test

Please telephone the laboratory and alert them that these samples come from a possible case of dialysis related haemolysis, and request that they telephone back the result of the haemolytic index. This numerical result recording visible red or brown discolouration of serum is rapidly obtained before any other tests are done and enables early reassurance in most cases.

If the laboratory reports evidence of haemolysis or possible haemolysis contact your local Renal Unit or Renal Registrar on – call at Belfast City Hospital 02890329241.

Continue to provide appropriate supportive treatment.

## **If contacted directly by patient with suspected haemolysis**

- Advice them to attend your Department for the necessary evaluation.
- Haemodialysis patients who contact EDs raising the issue of haemolysis should be seen promptly & not postponed to the following day.

# HYPERKALAEMIA

The reported incidence of hyperkalaemia in hospitalised patients is between 1 and 10%. The vast majority of cases are related to patients prescribed angiotensin converting enzyme inhibitors (ACE) or angiotensin II receptor blockers (ARBs) in conjunction with spironolactone with pre-existing or new renal failure. Most other cases are related to potassium supplementation and prescription of diuretics/medicines with potassium-sparing properties.

## **1. Aetiology of Hyperkalaemia**

### **a) Renal Causes**

- Acute or chronic renal failure
- Hyperkalaemic renal tubular acidosis (type IV)
- Mineralocorticoid deficiency (hypoaldosteronism states)
- Medicines that interfere with potassium excretion (amiloride, spironolactone)
- Medicines that interfere with the renin-angiotensin system (angiotensin converting enzyme inhibitors, angiotensin II receptor blockade, non-steroidal anti-inflammatory agents, heparin)

### **b) Transcellular shift (intracellular to extracellular compartment)**

- Acidosis (including diabetic ketoacidosis)
- Medicines (digoxin poisoning, suxamethonium, beta-blockade)

### **c) Increase circulating potassium - Exogenous or Endogenous**

- Exogenous (potassium supplementation)
- Endogenous (tumour lysis syndrome, rhabdomyolysis, trauma, burns)

### **d) Pseudohyperkalaemia**

- Prolonged tourniquet time
- Test tube haemolysis
- Marked leucocytosis and thrombocytosis (measure plasma not serum concentration in these disease states)
- Sample taken from a limb infused with IV fluids containing potassium

## **2. Assessment of The Patient**

### **a) Is this “true” hyperkalaemia?**

A repeat serum potassium should be ordered urgently, especially if hyperkalaemia is an unexpected or isolated finding and there are no ECG signs of hyperkalaemia, to exclude pseudohyperkalaemia.

## b) How severe is the hyperkalaemia?

Hyperkalaemia is classified as –

- **mild** (K<sup>+</sup> 5.5 - 6.0 mmol/L)
- **moderate** (K<sup>+</sup> 6.1 - 6.9 mmol/L )
- **severe** K<sup>+</sup> 7.0 mmol/L or if ECG changes or symptoms (muscle weakness or flaccid paralysis palpitations, paresthesias) occurring at **ANY** level of serum potassium <sup>≥</sup>5.5mmol/L especially if associated with hypoxia.

Situations associated with a rapid rise in potassium (acute renal failure, rhabdomyolysis) **and hypoxia of any cause** are more strongly associated with the development of cardiac conduction disturbances.

Mild hyperkalaemia is common and often well tolerated in patients with chronic renal failure.

### 3. Is urgent treatment required?

Urgent treatment is required if the serum potassium is >7 mmol/L OR hyperkalaemia is accompanied by ECG changes or above symptoms - even in the presence of mild hyperkalaemia (K<sup>+</sup> 5.5 - 6.0 mmol/L).

Treat as per the GAIN guidelines (see next page)

# Emergency management of hyperkalaemia in adults

Incidence between 1 and 10% in hospitalised patients. Majority of cases are related to pre-existing or new Renal Failure, potassium supplementation or diuretics/medicines with potassium - sparing properties. Classified as mild (serum potassium 5.5 - 6.0 mmol/L), moderate (serum potassium 6.1 - 6.9 mmol/L), severe (serum potassium  $\geq 7.0$  mmol/L) Consult senior colleagues in clinical team

REVISED  
23 JULY  
2008

## COMMON CAUSES OF HYPERKALAEMIA IN ADULTS

### RENAL CAUSES

- Acute or Chronic Renal Failure\*
- Medicines inhibiting R-A-A system (ACE inhibitors, ARBs, NSAIDs, heparin)\*
- Medicine induced inhibition of potassium excretion (eg amiloride, spironolactone)\*
- Hyperkalaemic RTA (Type IV)\*

### TRANSCELLULAR SHIFT OF POTASSIUM

- Acidosis (including Diabetic Ketoacidosis)\*
- Medicines (digoxin poisoning, suxamethonium)

### INCREASED CIRCULATING POTASSIUM

- Exogenous serum potassium (potassium supplements in medicines)
- Endogenous (burns, trauma, rhabdomyolysis)

\* = MOST COMMON CAUSES

### STEP 1: COMPREHENSIVE HISTORY AND EXAMINATION to determine and treat reversible causes of hyperkalaemia: ALWAYS TREAT THE UNDERLYING CAUSE.

- Non-specific symptoms include fatigue, weakness, paresthesias, palpitations (may be absent even with severe hyperkalaemia).
- Focus on past history of renal problems and medication usage: **Stop potassium containing fluids/foods and medicines inhibiting potassium excretion.**
- Exclude urinary tract obstruction (examine for bladder distension/prostatic hyperplasia). Catheterise if appropriate.

### STEP 2: QUESTIONS AND INITIAL INVESTIGATIONS

#### Q: Is hyperkalaemia really present?:

Pseudohyperkalaemia (e.g. haemolysed sample). Repeat serum potassium urgently but do not delay treatment if renal failure or if hyperkalaemic ECG changes.

#### Q: Is Emergency Treatment needed?:

Yes if ECG changes present (Peaked T waves, PR prolongation, decreased or absent P waves, QRS widening, AV block, sine wave QRST)

**A normal ECG does not obviate the need for therapy - the ECG can be normal in severe hyperkalaemia.**

Yes if severe hyperkalaemia. Acute changes in serum potassium are more likely to cause cardiac arrhythmias.

A 12-lead ECG with cardiac monitoring, repeated assessment of glucose (BM, testing) urea and electrolytes is mandatory. Creatinine kinase/blood gas analysis (if indicated).

### STEP 3: MANAGEMENT Use Hyperkalaemia Kit

#### 1. Protect the cardiac membrane:

Administer 10ml calcium gluconate 10% solution IV over 2 minutes. Effects noted 1 to 3 minutes and last approximately 30-60 minutes. Caution if patient taking digoxin.

#### 2. Shift potassium into cells:

##### (a) Insulin

Withdraw 10 units of Actrapid® insulin using an INSULIN syringe.

Always obtain a check of volume from a senior nurse before proceeding. Add to 50ml glucose 50% and administer by slow IV injection over 5 minutes. Effects observed in 15 minutes and last 4-6 hours. Monitoring – blood glucose should be measured 30 minutes after insulin/glucose administration and then hourly up to 6 hours after completion of administration. Check urea and electrolytes 30 minutes after each administration of insulin/glucose.

##### (b) Beta 2 Adrenergic Therapy

Administer 10mg nebulised salbutamol.

Effect observed 15-30 minutes. May not always reduce serum potassium and not used as a single agent. Synergistic serum potassium lowering effect when used with insulin/glucose above.

Calcium gluconate, Insulin and Beta-2 agonists buy time and can be repeated multiple times while definitive measures are pursued.



#### 3. Stop potassium intake:

Stop potassium supplements and potassium containing drugs. Avoid potassium rich fluids or foodstuffs in diet.

#### 4. Remove potassium from the body:

##### (a) Use dialysis

Required only in exceptional circumstances where severe hyperkalaemia persists despite appropriate management. Ask senior colleague to consult with renal team.

##### (b) Use the gut

Calcium polystyrene sulphonate (Calcium Resonium®) orally. Limited efficacy and delayed action (BNF for details)

## MENTAL HEALTH

- Always use a calm empathic approach to patients with mental illness –they respond best to someone who listens to them properly.
- Antrim hospital is introducing a pilot programme whereby patients with mental health, addictions problems and frail elderly with possible depression or dementia will be assessed by one team with all referrals going through a single point of entry and single phone number. This will be rolled out in piecemeal fashion over the next 6 months.

Common conditions that you will encounter are self harm, substance abuse, depression with suicidal ideation and panic attack disorder. Many of these presentations are commonest during the night.

Patients should undergo medical and mental health assessment in tandem. All patients with mental health presentations should be triaged according to the Mental Health Triage Tool as detailed on the next two pages.

If the patient has no medical needs they can be referred by the Triage nurse to be seen directly by RAID team in the Observation Ward.

Those with medical needs with the exception of symptoms suggestive of psychosis may also wait in the Observation for RAID and their medical assessment a copy of the notes will be left in the relevant Majors or Minors area and the doctor should attend to them in turn. Patients with medical needs requiring immediate intervention should be managed in resus appropriately before inward referral, likely to an inpatient team rather than the Observation Ward.

Patients should be for for assessment at time of referral to RAID (this is different from medically fit for discharge). Alcohol levels are NOT to be sent on patients with mental health presentations unless clinically indicated (blood alcohol has very limited clinical benefit).

Patients triaged as “red” must be seen as a priority to safety concerns of the patient, staff or others.

The Mental Health Order (Northern Ireland) 1986 is detailed in the next section. These patients may be suitable for RAID assessment but may require formal detention.

<b>Patient Details (use addressograph label)</b> Surname: _____ First Name: _____ DOB: _____ NHT number: _____ H+C number: _____ Contact number: _____	Date: _____
	Time: _____
	Accompanied by: _____
	Contact telephone: _____
	Description: _____
	_____

Brief history of episode from patient

---

Information from relatives / others

Risk Assessment	YES	NO	Actions
Is the person requiring immediate life-saving treatment for airway compromise, inadequate breathing, shock, seizure or hypoglycaemia?	<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> <li>Alert medical staff immediately</li> <li>Resuscitate using ABCDE approach</li> </ul>
Is the person displaying violent or threatening behaviour or are there reports of violent behaviour?	<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> <li>Continuous 1:1 visual surveillance</li> <li>Alert Nurse in charge and senior ED doctor</li> <li>Ensure safe environment for patients and others</li> <li>Consider security +/- PSNI if staff or patient safety compromised</li> <li>Consider use of MHO</li> <li>Consider medical cause for behaviour</li> </ul>
Is there obvious immediate risk to the department, staff or patients e.g. Possession of a weapon?	<input type="checkbox"/>	<input type="checkbox"/>	
Does the patient require restraint (by staff or PSNI)?	<input type="checkbox"/>	<input type="checkbox"/>	
Is the person confused, extremely agitated or distressed or unable to co-operate with assessment?	<input type="checkbox"/>	<input type="checkbox"/>	
Has the person an altered level of consciousness, acute neurological deficit, abnormal pulse or very low SaO <sub>2</sub> ?	<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> <li>Alert medical staff urgently</li> <li>Manage using ABCDE approach</li> </ul>
Is there person acting in a bizarre manner or are there reports of about hallucinations or delusions?	<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> <li>Refer to Mental Health Team as soon as able after medical assessment</li> </ul>
Has the person presented with overdose, poisoning, self harm?	<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> <li>Continuous visual supervision</li> <li>Inform Nurse in charge</li> <li>Inform ED clinician of possible need for parallel medical assessment</li> <li>Refer to MHT for immediate response or Consider use of MHO</li> <li>Ensure safe environment for patient and others. Use defusing techniques as required</li> <li>Consider security +/- PSNI if staff or patient safety compromised</li> </ul>
Is the person actively suicidal or are they expressing immediate plans to self harm?	<input type="checkbox"/>	<input type="checkbox"/>	
Is the patient at risk of leaving before psychosocial assessment or medical treatment? <i>need to complete 'psychosocial assessment in the ED'</i>	<input type="checkbox"/>	<input type="checkbox"/>	

Print out latest TOXBASE information for all toxins / drugs  Tick when complete  
[www.toxbase.org](http://www.toxbase.org)

Is ACTIVATED CHARCOAL indicated?  YES  NO If yes discuss promptly with doctor or use PGD

Risk Assessment	YES	NO	Actions
<b>Is there a history of head injury, unconsciousness, new neurological deficit or low SaO<sub>2</sub>?</b>	<input type="checkbox"/>	<input type="checkbox"/>	<b>• Requires medical assessment</b>
Is there a history of major psychiatric illness or event?	<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> <li>• Close supervision, do not leave alone without support person</li> <li>• Ensure safe environment for patient and others.</li> <li>• Refer to MHT for urgent response</li> <li>• May need to consider medical assessment</li> <li>• Consider re-triage if evidence of increasing behavioural disturbance or medical deterioration</li> </ul>
Has the person suicidal ideation or expressing a desire to harm themselves without immediate intent?	<input type="checkbox"/>	<input type="checkbox"/>	
Is there a potential to harm others?	<input type="checkbox"/>	<input type="checkbox"/>	
Is the person markedly distressed, agitated or restless?	<input type="checkbox"/>	<input type="checkbox"/>	
Is the person very withdrawn or uncommunicative?	<input type="checkbox"/>	<input type="checkbox"/>	
Is the person expressing thoughts of life not worth living or hopelessness?	<input type="checkbox"/>	<input type="checkbox"/>	
Is there ambivalence towards assessment or lack of engagement?	<input type="checkbox"/>	<input type="checkbox"/>	
Does the person deny suicidal ideation or self harm?	<input type="checkbox"/>	<input type="checkbox"/>	<ul style="list-style-type: none"> <li>• Intermittent observation</li> <li>• Refer to MHT for routine response or consider Card Before You Leave (<i>need to complete 'Psychosocial Assessment in the ED' before CBYL referral</i>)</li> <li>• May need to consider medical assessment</li> <li>• Consider re-triage if evidence of increasing behavioural disturbance or medical deterioration</li> </ul>
Is the person displaying minimal or no agitation or restlessness?	<input type="checkbox"/>	<input type="checkbox"/>	
Is the patient co-operative?	<input type="checkbox"/>	<input type="checkbox"/>	
Does the person report symptoms of anxiety or depression?	<input type="checkbox"/>	<input type="checkbox"/>	
Does the person report social, accommodation or relationship difficulties?	<input type="checkbox"/>	<input type="checkbox"/>	

Does the patient have dependents or children or have regular access to same?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	Details:
UNOCINI commenced	<input type="checkbox"/> YES	<input type="checkbox"/> NO	Details:
SOSCARE checked	<input type="checkbox"/> YES	<input type="checkbox"/> NO	Details:
Does the patient have their own safeguarding needs? e.g. Vulnerable adult	<input type="checkbox"/> YES	<input type="checkbox"/> NO	Details:

Medical Needs Identified	<input type="checkbox"/> YES	Stream as per MT category while awaiting MHT assessment
	<input type="checkbox"/> NO	Suitable for direct referral to MHT

Fit for referral to Mental Health Team and agrees to assessment ( <i>over 18 yrs</i> )	<input type="checkbox"/> YES	Accepted by: Time:
<b>9am to 5pm Tel: 336208</b>	<input type="checkbox"/> NO	Reason not referred:
<b>5pm to 9am Tel: 94413142</b>		

Triage completed by: Grade:	Signature :
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## **The patient presenting with psychosis**

### **a) Is there any evidence of rational thinking loss?**

If the patient is psychotic, your second task is to exclude organic disease requiring medical treatment (until an organic cause is excluded the patient must remain under your care).

### **b) Are there any Features that suggest Organic Psychosis?**

- Sudden onset
- Fluctuation
- Non-auditory hallucinations
- Clouding of Consciousness (Orientation must be assessed and documented properly)
- Disturbed cognitive function –e.g. serial 7s
- Identifiable cause of confusion e.g. alcohol or drug misuse, sepsis, head injury, metabolic or electrolyte disturbance

### **c) Management of patients with psychosis**

- Use diffusing techniques as required
- Rapid sedation of patients with altered mental state should only be undertaken by the senior ED doctor.
- Treat any underlying organic causes and admit under medical team
- If no underlying organic cause found refer for mental health assessment – to RAID who will undertake this assessment if patient is willing otherwise the patient will require assessment under the Mental Health Order (NI) 1986. The EPIC / consultant on call should be made aware of these patients.

## **Focused Psychosocial Assessment of Needs in the ED.**

The following is the agreed assessment to be used in the ED. Patients often find it distressing having to repeat their story to several different people so this assessment does not need to be undertaken by ED staff if there will be a timely RAID assessment. The exceptions to this are:

High risk patients as determined by a multiple positive responses or single high risk (\*) responses should not be discharged home by junior medical staff without consulting with senior medical staff. These patients should be assessed by RAID on this attendance

**Psychosocial Assessment in the ED**

- To be completed if change in mental state, considering CBYL or if patient at risk of absconding.
- The aim of this assessment is to qualify risks – a greater number of positive responses suggest greater level of risk for self harm. Items with an \* may indicate high risk
- Not required if MHT psychosocial assessment completed
- Always consider if a medical illness could be the cause of the presentation

<b>1. General Observations</b>	<b>YES</b>	<b>NO</b>
Is the person displaying violent or threatening behaviour or are there reports of same?*	<input type="checkbox"/>	<input type="checkbox"/>
Does the person pose an immediate risk to self, you or others?*	<input type="checkbox"/>	<input type="checkbox"/>
Does he/she have specific ideas or plans to harm anyone else?*	<input type="checkbox"/>	<input type="checkbox"/>
Does he/she have a history of violence?	<input type="checkbox"/>	<input type="checkbox"/>
Is there any suggestion, or does it appear likely that the person may try to abscond?*	<input type="checkbox"/>	<input type="checkbox"/>
<b>If yes to any of the above, record details below:</b>		
<b>2. Appearance and Behaviour</b>	<b>YES</b>	<b>NO</b>
Is the person obviously distressed, markedly anxious or highly aroused?	<input type="checkbox"/>	<input type="checkbox"/>
Is the person behaving inappropriately to the situation?	<input type="checkbox"/>	<input type="checkbox"/>
Is the person quiet and withdrawn?	<input type="checkbox"/>	<input type="checkbox"/>
Is the person inattentive and unco-operative?	<input type="checkbox"/>	<input type="checkbox"/>
<b>Give details:</b>		
<b>3. Medical and Mental Health</b>	<b>YES</b>	<b>NO</b>
Does the patient have a history of mental health problems or psychiatric illness?	<input type="checkbox"/>	<input type="checkbox"/>
Is the person currently attending mental health services?*	<input type="checkbox"/>	<input type="checkbox"/>
Is there poor adherence to psychiatric treatment?	<input type="checkbox"/>	<input type="checkbox"/>
Does the patient describe symptoms of depression?*	<input type="checkbox"/>	<input type="checkbox"/>
Is the person experiencing thoughts of helplessness or hopelessness?*	<input type="checkbox"/>	<input type="checkbox"/>
Is the person acting in a bizarre manner or are there reports about hallucinations or delusions?*	<input type="checkbox"/>	<input type="checkbox"/>
Does the person feel controlled or influenced by external forces or is there evidence of psychosis?*	<input type="checkbox"/>	<input type="checkbox"/>
Is there a history of suicide amongst family or friends?*	<input type="checkbox"/>	<input type="checkbox"/>
Is there a history of chronic illness or pain?	<input type="checkbox"/>	<input type="checkbox"/>
<b>If yes to any of the above, record details below:</b>		
<b>4. Current Presentation</b>		
Why is the person presenting now?		
What recent event(s) precipitated or triggered this presentation?		

<b>5. Self Harm</b>	<b>YES</b>	<b>NO</b>
Does the person have a past history of overdose, poisoning or self harm?* (Dates if possible)	<input type="checkbox"/>	<input type="checkbox"/>
Previous use of violent methods of self harm?*	<input type="checkbox"/>	<input type="checkbox"/>
Does the person have access to lethal means of harm?	<input type="checkbox"/>	<input type="checkbox"/>
Did the person present with self harm?*	<input type="checkbox"/>	<input type="checkbox"/>
If yes, did they intend to die?*	<input type="checkbox"/>	<input type="checkbox"/>
Was there evidence of planning?*	<input type="checkbox"/>	<input type="checkbox"/>
Was there evidence of suicide note/text/email etc?*	<input type="checkbox"/>	<input type="checkbox"/>
Were precautions taken to prevent rescue?*	<input type="checkbox"/>	<input type="checkbox"/>
<b>If yes to any of the above, record details below:</b>		
<b>6. Alcohol and Substance Misuse</b>	<b>YES</b>	<b>NO</b>
Is there a history of alcohol or substance misuse?	<input type="checkbox"/>	<input type="checkbox"/>
Is the person currently under the influence of alcohol or substances?	<input type="checkbox"/>	<input type="checkbox"/>
<b>If yes to any of the above, record details below:</b>		
<b>7. Social History</b>	<b>YES</b>	<b>NO</b>
Male gender?	<input type="checkbox"/>	<input type="checkbox"/>
Is the person aged 65 or older?*	<input type="checkbox"/>	<input type="checkbox"/>
Is the person separated, widowed or divorced?	<input type="checkbox"/>	<input type="checkbox"/>
Is there a lack of social support or live alone?	<input type="checkbox"/>	<input type="checkbox"/>
Is the person unemployed or retired?	<input type="checkbox"/>	<input type="checkbox"/>
Is there a current personal crisis e.g. legal / financial / family?	<input type="checkbox"/>	<input type="checkbox"/>
Are family concerned about the risk?*	<input type="checkbox"/>	<input type="checkbox"/>
<b>If yes to any of the above, record details below:</b>		
<b>8. Does the patient have capacity to make decisions regarding treatment and assessment?</b>	<input type="checkbox"/> YES	<input type="checkbox"/> NO
You must only regard a patient as lacking capacity once it is clear that, having been given all appropriate help and support, they cannot understand, retain, use or weigh up the information needed to make that decision, or communicate their wishes. <i>Good Medical Practice 2013</i>		
<b>If you feel this patient does not have capacity please give details:</b>		

<b>Summary of Assessment</b>
<b>Action plan</b>
<b>Assessment completed by:</b> _____ <b>Time:</b> _____ <b>Date:</b> _____

Name and Signature:

Designation:

## MENTAL HEALTH ORDER (ni) 1986

THE MENTAL HEALTH ORDER ONLY APPLIES TO CONDITIONS THAT ARE CAUSED BY MENTAL ILLNESS. IT DOES NOT PERMIT YOU TO DETAIN PATIENTS IN ANTRIM HOSPITAL OR TO TREAT PATIENTS WITHOUT CONSENT. IF YOU DECIDE THAT A PATIENT DOES NOT HAVE THE CAPACITY TO CONSENT AND THAT IT IS IN HIS/HER BEST INTERESTS TO RESTRAIN AND TREAT THEM YOU ARE RELYING ON COMMON LAW.

(see GMC Publication "Seeking Patient's consent: the ethical considerations" 1998, available online at [www.gmc-uk.org](http://www.gmc-uk.org))

### 1. Use of the Mental Health Order

**Mental illness** is defined as a "state of mind which affects a person's thinking, perceiving, emotion or judgement to the extent that he requires care or medical treatment in his own interests or the interests of other persons."

**Compulsory admission for assessment** of a patient can only occur when:

1. He or she is suffering from a mental disorder of a nature or degree which warrants detention in hospital for assessment (or for assessment followed by medical treatment)

*AND*

2. Failure to detain the patient would create a substantial likelihood of serious physical harm to him or herself or to other persons

**Criteria for likelihood of serious physical harm** are evidence of one of the following:

1. The patient has inflicted, or threatened or attempted to inflict, serious physical harm on him/herself
2. The patient's judgement is so affected that he or she is, or would soon be, unable to protect him/herself against serious physical harm and that reasonable provision for his/her protection is not available in the community or
3. The patient has behaved violently towards other persons or so behaved him or herself that other persons are placed in reasonable fear of serious physical harm to themselves

## **2. How to Arrange a Mental Health Assessment**

Always discuss with the ED consultant first. When the patient is in the ED they are not considered admitted and therefore the “community setting” forms are to be used. A Form 1 or 2 AND a Form 3 must be completed.

### **a) Form One / Two**

An application for compulsory admission needs to be made by either the *nearest relative* (on Form 1) OR preferably an *Approved Social Worker* (ASW) (on Form 2). The ASW can be contacted through switchboard (or Dal Doc for the number). If no ASW is available then it may be necessary for the nearest relative (guidance on who is considered to be the "nearest relative" is on the back of the Form). Please consider the implications of asking a relative to detain a family member.

### **b) Form Three**

There must also be a *Medical Recommendation* for psychiatric assessment made on Form 3 either by the patient's GP or someone acting on behalf of the GP. Form 3 is the only Doctors' form that applies in the Emergency Department setting and when you complete it you are acting in place of the patient's GP (always try to contact the GP or OOH GP first). Note that this only applies to patients with mental illness, not organic psychosis, intoxication, drug abuse and so on.

The application is usually addressed to the Northern Trust, The Cottage, Ballymena (Holywell Hospital is part of this Trust). Your application on the form

must include the following information: the grounds (including a clinical description of the mental condition of the patient) for the opinion that the detention is warranted; the evidence for the opinion that failure to detain the patient would create a substantial likelihood of serious physical harm.

A diagnosis of the specific form of mental disorder is not required.

When a patient is detained via Mental Health Order Forms, they are legally binding documents, they cannot be disregarded. They can only be “cancelled” after an assessment by a *psychiatrist*. YOU MUST NEVER DISREGARD, TEAR UP OR LOSE A COMPLETED MENTAL HEALTH ACT APPLICATION.

### c) Form Five

A Form 5 may be completed on an inpatient e.g. a patient admitted to the Obs Ward, to hold the patient until formal psychiatric assessment. There does not need to be a Form 1 or 2 completed.

N.B.: patients should NOT be admitted to the Obs ward for the sole purpose of facilitating completion of MHO forms. A Form 5 does not allow the patients to be transferred to a Mental Health Unit – use a Form 3 and 1/2 for this.

## DRUG AND SOLVENT ABUSE (SEE POISONING, LEGAL ISSUES)

This may present with acute poisoning or with the consequences of chronic abuse. Children as young as 10 have presented to this department with drug related symptoms. Substance abuse is often concealed by the patient and you have to have a high index of suspicion.

### Look out for the following:-

- muscle twitching & jaw spasm, tachycardia - Ecstasy
- peri-oral rash - glue sniffing
- minor psychiatric illness - any
- panic attacks/palpitations – any
- pin point pupils/marks on forearms etc - opiate

Acute presentations of non-opiate drug abuse do not automatically require admission, even if the patient is distressed. Admit if significantly altered vital signs and/or mental state. A responsible adult must supervise discharges.

All patients who have collapsed/overdosed on Heroin or other opiates must be admitted even if apparently recovered.

### Chronic Substance Misuse

The signs of **opiate withdrawal** include agitation, nausea & vomiting, diarrhoea, shivering & “goosebumps”, muscle cramps and dilated pupils. Oral benzodiazepines are the sedation of choice. You should seek advice from the addiction team at Holywell hospital urgently.

Patients who do not require admission for their substance misuse may still benefit from review by the Alcohol and Substance Misuse Nurse

**Have a high suspicion of atypical infections in patients with sepsis who are IV drug users. Be aware of current alerts for the Department of Health particularly when there are spikes in deaths or evidence of contaminated drugs.**

## Substance Misuse

Access to help with patients presenting with substance misuse problems will be through the RAID service. Phone extension 336208 with patient details and reason for referral and the team will provide a timely response or advice on how best to manage your patient.

## THE VIOLENT PSYCHOTIC PATIENT

- Diffusion techniques should normally be attempted first – give patient space, “drop authority”, talk quietly, listen, reassure, offer the opportunity to “go out and have a smoke” with supervision.
- Rapid Sedation is only appropriate when *necessary* for the safety of the patient or others *and when there is evidence of mental impairment* (toxic confusion or psychosis)
- Hospital *staff should not be put at risk*. Consideration should be given to obtaining urgent assistance from the police or security prior to restraining the patient for the purpose of rapid sedation.
- **The drug of choice is HALOPERIDOL 5-10mg intramuscularly. This can be treated if ineffective**
- **You must take reasonable steps to exclude a physical cause for violence/confusion – consider hypoxia, metabolic upset, CNS lesion etc**

## ALCOHOL WITHDRAWAL

Alcohol withdrawal syndrome (AWS) is a set of symptoms caused by ABRUPTLY stopping drinking after prolonged heavy consumption. Because of its affect on the brain and autonomic nervous system, it carries the risk of death or permanent neurological disability so it requires careful management. Unfortunately, most patients who are problem drinkers are difficult to assess and very difficult to manage. Their relatives and GPs are often at their wits’ end, adding to the pressure on you.

Some patients who require admission for another condition develop AWS in the ward necessitating treatment–this is *secondary* detox. This section

considers *primary* detox only i.e. patients for whom AWS or a detox request is the presenting problem.

Medical Evidence now suggests that

- Reducing intake gradually rather than total abstinence may be more effective for many patients and it should avoid AWS
- Repeated failed detox (often requested impulsively by patients due to psychosocial pressures) is harmful to the patient leading to seizures and more severe AWS in the future
- Most patients requiring detox can be managed solely in the community
- Those patients not suitable for community management require medical admission (do not admit to the Observation Ward).

### **Guideline for the Community Management of AWS**

- Document baseline examination for WKS: confusion?, ataxia?, ophthalmoplegia?: if present admit medically
- Carry out brief intervention using FRAMES method (box below)
- Dispense maximum of chlordiazepoxide 30mg qid for two days, chlordiazepoxide 20mg tid for two days pending GP assessment
- Dispense Thiamine 100mg bd
- Advise that some sleep disturbance is inevitable during the recovery process
- Advise NOT to drink while taking chlordiazepoxide!
- Advise to see GP at first available appointment
- Advise to re-attend Emergency Department for re-assessment if becomes acutely unwell on this regime

### **Initial Management in the Emergency Department for Patients to be Admitted**

- Chlordiazepoxide 40-60mg stat dose
- Pabrinex (1+2) x 2 doses IV
- IV fluid rehydration if necessary

### **FRAMES BRIEF INTERVENTION**

- FEEDBACK: of your assessment of the situation
- RESPONSIBILITY is the patient's alone
- ADVICE to stop drinking
- MENU of options to help
- EMPATHY i.e. Show warmth and understanding
- SELF-EFFICACY i.e encourage the patient to believe that abstinence or reduction is achievable

## CLINICAL INSTITUTE WITHDRAWAL ASSESSMENT OF ALCOHOL SCALE, REVISED (CIWA-AR)

Patient: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ (24 hour clock, midnight = 00:00)

Pulse or heart rate, taken for one minute: \_\_\_\_\_ Blood pressure: \_\_\_\_\_

**NAUSEA AND VOMITING** — Ask "Do you feel sick to your stomach? Have you vomited?" Observation.

- 0 no nausea and no vomiting
- 1 mild nausea with no vomiting
- 2
- 3
- 4 intermittent nausea with dry heaves
- 5
- 6
- 7 constant nausea, frequent dry heaves and vomiting

**TACTILE DISTURBANCES** — Ask "Have you any itching, pins and needles sensations, any burning, any numbness, or do you feel bugs crawling on or under your skin?" Observation.

- 0 none
- 1 very mild itching, pins and needles, burning or numbness
- 2 mild itching, pins and needles, burning or numbness
- 3 moderate itching, pins and needles, burning or numbness
- 4 moderately severe hallucinations
- 5 severe hallucinations
- 6 extremely severe hallucinations
- 7 continuous hallucinations

**TREMOR** — Arms extended and fingers spread apart. Observation.

- 0 no tremor
- 1 not visible, but can be felt fingertip to fingertip
- 2
- 3
- 4 moderate, with patient's arms extended
- 5
- 6
- 7 severe, even with arms not extended

**AUDITORY DISTURBANCES** — Ask "Are you more aware of sounds around you? Are they harsh? Do they frighten you? Are you hearing anything that is disturbing to you? Are you hearing things you know are not there?" Observation.

- 0 not present
- 1 very mild harshness or ability to frighten
- 2 mild harshness or ability to frighten
- 3 moderate harshness or ability to frighten
- 4 moderately severe hallucinations
- 5 severe hallucinations
- 6 extremely severe hallucinations
- 7 continuous hallucinations

**PAROXYSMAL SWEATS** — Observation.

- 0 no sweat visible
- 1 barely perceptible sweating, palms moist
- 2
- 3
- 4 beads of sweat obvious on forehead
- 5
- 6
- 7 drenching sweats

**VISUAL DISTURBANCES** — Ask "Does the light appear to be too bright? Is its color different? Does it hurt your eyes? Are you seeing anything that is disturbing to you? Are you seeing things you know are not there?" Observation.

- 0 not present
- 1 very mild sensitivity
- 2 mild sensitivity
- 3 moderate sensitivity
- 4 moderately severe hallucinations
- 5 severe hallucinations
- 6 extremely severe hallucinations
- 7 continuous hallucinations

**ANXIETY** — Ask "Do you feel nervous?" Observation.

- 0 no anxiety, at ease
- 1 mild anxious
- 2
- 3
- 4 moderately anxious, or guarded, so anxiety is inferred
- 5
- 6
- 7 equivalent to acute panic states as seen in severe delirium or acute schizophrenic reactions

**HEADACHE, FULLNESS IN HEAD** — Ask "Does your head feel different? Does it feel like there is a band around your head?"

- Do not rate for dizziness or lightheadedness. Otherwise, rate severity.
- 0 no present
- 1 very mild
- 2 mild
- 3 moderate
- 4 moderately severe
- 5 severe
- 6 very severe
- 7 extremely severe

**AGITATION** — Observation.

- 0 normal activity
- 1 somewhat more than normal activity
- 2
- 3
- 4 moderately fidgety and restless
- 5
- 6
- 7 paces back and forth during most of the interview, or constantly thrashes about

**ORIENTATION AND CLOUDING OF SENSORIUM** —

- Ask "What day is this? Where are you? Who am I?"
- 0 oriented and can do serial additions
- 1 cannot do serial additions or is uncertain about date
- 2 disoriented for date by no more than 2 calendar days
- 3 disoriented for date by more than 2 calendar days
- 4 disoriented for place/or person

The CIWA-Ar is not copyrighted and may be reproduced freely.  
Sullivan, J.T.; Sykora, K.; Schneiderman, J.; Naraino, C.A.; and Sellers, E.M.  
Assessment of alcohol withdrawal: The revised Clinical Institute Withdrawal  
Assessment for Alcohol scale (CIWA-Ar). *British Journal of Addiction* 84:1353-1357, 1989.

Patients scoring less than 10 do not usually need additional medication for withdrawal.

Total CIWA-Ar Score \_\_\_\_\_

Rater's Initials \_\_\_\_\_

Maximum Possible Score 67

## ALCOHOL AND THE LAW

Not infrequently, patients with alcohol withdrawal syndrome or other alcohol-related disorder will try to leave hospital or will refuse treatment. For example, during rapid sedation of the agitated patient some level or temporary restraint is often employed. It is important for staff who treat such patients to understand both their duty of care and their legal position in relation to these issues.

**Firstly, doctors should be aware that the Mental Health (NI) Order 1986 can NOT be used to detain patients with alcohol problems for compulsory assessment unless they have an intercurrent mental illness that mandates compulsory assessment**

**Secondly, the law presumes that all registered medical practitioners are qualified to make an assessment of a patient's capacity to consent or refuse medical treatment.**

Patients with alcohol-related problems MAY have impaired capacity (see capacity checklist below) and in this event a doctor may impose restraint or treatment under the authority of Common Law providing that all the following stringent conditions apply:

- That there is the *urgent necessity* for treatment
- That the intervention is in the patient's *best interests*
- That the doctor is acting in *good faith* in line with what a responsible body of medical opinion would do in the situation

### **Capacity Checklist**

- Patient understands what the proposed treatment is and its purpose
- Patient understands the main risks, benefits and alternatives
- Patient understands the consequences of refusing treatment
- Patient believes the information
- Patient can retain the information long enough to make a judgement

If a patient has the capacity to withhold consent for treatment (this includes leaving the hospital contrary to advice), treatment MUST not be imposed on the patient irrespective of the consequences. The practice of notifying PSNI that a patient has left contrary to advice is rarely appropriate and a medical practitioner should always be involved in this decision for the reasons explained above.

## ED MANAGEMENT OF SUSPECTED BODY PACKERS / BODY STUFFERS

**Bodypacker** - *An individual who ingests wrapped packets of illicit drugs such as cocaine, heroin, amphetamines, ecstasy or marijuana to transport them. A person who transports illicit drugs by internal concealment.*

**Bodystuffer** - *also known as mini-packers, are generally small scale traffickers or users who, when they come into contact with police or customs officials, immediately swallow the drug in secretly prepared wrappings in order to avoid arrest.*

The majority of these patients will be suspected Bodypackers and will be under arrest, and accompanied by UKBA (UK Border Agency) Staff. It is important to have a high index of clinical suspicion with these patients as they can abruptly become extremely unwell.

Please refer to TOXBASE “Bodypacker” for further clinical information  
90% of previous admissions here have been carrying Cocaine. 10% ingested marijuana packages.

### Clinical Management

- ALL SUSPECTED/ACTUAL BODYPACKERS REQUIRE ADMISSION FOR OBSERVATION (see Toxbase advice)
- Inform Consultant on-call or Registrar in Emergency Department
- Regular observations
- Imaging – plain x-ray useful, USS useful if available, CT Abdomen/Pelvis can help if equivocal plain films.
- Bowel prep will decrease transit time for packages and decrease risk to patient – Moviprep/Kleen Prep treatment to be initiated in the ED.
- Patients who do not consent to imaging/bowel prep/admission should be discussed with a senior ED Doctor
- Be aware that UKBA staff require to be present AT ALL TIMES during history / examination / imaging / admission. This is for your own safety.
- Admission should be to the Obs Ward

## THE UNCONSCIOUS PATIENT

- Assess and treat ABC
- Measure temperature and test glucose with BM stick (treat hyperpyrexia or hypoglycaemia immediately)
- Get as much information as possible (from ambulance crew, relatives, old notes etc.)
- Do a full clinical assessment (including fundoscopy, search for injuries/rashes and neurological exam.)
- Assess depth of coma using Glasgow Coma Scale. Involve anaesthetist if GCS<11 and inform senior ED doctor.
- Causes to consider:
  1. **Brain:**
    - Head injury
    - CVA
    - Fits
    - Meningitis/ encephalitis
  2. **Outside brain**
    - Hypoglycaemia
    - DKA
    - Other metabolic
    - Renal failure
    - Hepatic failure
    - Respiratory failure
    - Cardiac failure
  3. **Outside body**
    - Drugs (especially Ecstasy if hyperpyrexia)
    - Alcohol
    - Carbon monoxide poisoning
  4. **Environment**
    - Hypothermia
    - Hysteria
- If no diagnosis after clinical examination, blood tests and x-rays, or if focal neurology consider urgent CT scan

**Pupils**

Pupil size and reactivity	Cause
Small reactive pupils	Metabolic disorders Medullary lesion
Pinpoint pupils	Metabolic disorders Narcotic/organophosphate ingestions
Fixed midsize pupils	Midbrain lesion
Fixed dilated pupils	Hypothermia Severe hypoxia Barbiturates (late sign) During and post seizure
Unilateral dilated pupil	Anticholinergic drugs Rapidly expanding ipsilateral lesion Tentorial herniation Third nerve lesion Epileptic seizures

**Signs of Raised ICP**

1. Abnormal oculoccephalic reflexes (avoid in head injury)
  - When head is turned to left or right a normal response is for eyes to move away from the head movement; an abnormal response is no or random movement
  - When the head is flexed, a normal response is deviation of the eyes upward; a loss of conjugate upward gaze is a sign suggestive of raised ICP
2. Abnormal posturing
  - Decorticate (flexed arms, extended legs)
  - Decerebrate (extended arms. Extended legs)
3. Abnormal pupillary responses
  - Unilateral or bilateral dilation suggests raised ICP
4. Abnormal breathing patterns
  - Cheyne-Stokes
  - Apnoea
5. Cushing's triad:
  - Slow pulse
  - Raised BP
  - Abnormal breathing pattern

## STATUS EPILEPTICUS

### *Ask for senior advice*

- ABC + oxygen by NRRM
- Check blood glucose
- IV diazepam up to 10 mg slowly iv
- Phenytoin 15mg/kg by iv infusion (unless patient is on this already) (max. 1g)
- Consider 'Pabrinex' slow iv if history/suspicion of chronic alcohol excess

- Seek anaesthetic help
- Consider paraldehyde
- Consider phenobarbitone

Seek an underlying cause especially:

- Focal neurology – CT
- Injury – CT
- Fever or sepsis – consider acyclovir + cefotaxime
- Poisoning – try to get more history

One of the commonest causes of non-responding status is pseudoseizures – this diagnosis should only be considered by a very experienced doctor – seek help

## FITS, FAINTS AND FUNNY TURNS (SEE STATUS EPILEPTICUS, STROKE, TIA AND TLOC)

*Many will require outpatient investigation but few require admission, although patients who live alone should not be discharged alone; family help or a care package should be sought. Although alarming for patients, carers and doctors, most have a benign prognosis.*

“Funny turn” describes an ill-defined episode of impaired consciousness from which the patient has more or less recovered by the time they reach Emergency Department. This is an extremely common presentation to Emergency Department so you must develop a good system for rapidly evaluating these patients. The cause for the funny turn is usually cardiovascular or neurological. A meticulous history including an eyewitness account is the single most important aid to diagnosis. What was the patient

doing just before the attack? Ascertain whether or not consciousness was lost. If it was, rapid recovery suggests CVS cause, while more gradual recovery suggests NS. Was there injury, tongue biting or incontinence? Is there a history or family history of heart disease or epilepsy?

(Contrary to popular belief, TIA is an uncommon cause for transient loss of consciousness.)

A full history is imperative to include pre-morbid history, prodromal symptoms, length of time unconscious, degree of amnesia and confusion on recovery.

- A neurological cause, for example, epilepsy, SAH, can often be identified by the history, examination and the appropriate referral made.
- 50% of all cases have a cardiac cause and again, these can be determined by history, examination and ECG. Investigate and treat accordingly.

### **The remaining cases can be classified under five categories**

#### **1. Simple Faint**

Definite provocational factors with associated prodromal symptoms and which are unlikely to occur whilst sitting or lying. Benign in nature.

These patients can often be discharged home from the ED without follow-up.

If recurrent, will need to check the 3 “Ps” apply on each occasion

Provocation Prodrome Postural

(If not see Number 3 below).

#### **2. Loss of consciousness/ loss of or altered awareness likely to be unexplained syncope and low risk of re-occurrence**

These have no relevant abnormality on CVS and neurological examination and normal ECG.

Consider the TLOC guidelines

#### **3. Loss of consciousness/ loss of or altered awareness likely to be unexplained syncope and high risk of re-occurrence**

Factors indicating high risk:

- abnormal ECG
- clinical evidence of structural heart disease
- syncope causing injury, occurring at the wheel or whilst sitting or lying
- more than one episode in previous six months.

These patients usually need admitted under cardiology team, especially if first occurrence. Further investigations such as ambulatory ECG (48hrs), echocardiography and exercise testing may be indicated after specialist opinion has been sought.

#### 4. Presumed loss of consciousness/loss of or altered awareness with seizure markers

The category is for those where there is a strong clinical suspicion of epilepsy but no definite evidence.

The seizure markers act as indicators and are not absolutes

- a) unconsciousness for more than 5 mins.
- b) amnesia greater than 5 mins
- c) injury
- d) tongue biting
- e) incontinence
- f) remain conscious but with confused behaviour
- g) headache post attack

For patients presenting with first (possible) seizure consider Observation Ward pathway, if multiple episodes admit under medical team. Discharged patients should be referred to neurology OPD if not already under their care.

#### 5. Loss of consciousness/loss of or altered awareness with no clinical pointers

This category will have had appropriate neurology and cardiac opinion and investigations but with no abnormality detected. These patients should be admitted under appropriate team as clinically indicated.

##### All patients should have:

- Their medication list scrutinised (check ECR)
- Thorough CVS examination including erect & supine BP (wait 1 min and 3 mins to check erect BP) and auscultation of the neck.
- Thorough NS examination including fundoscopy
- An ECG – any arrhythmia or a  $QT_c > 460$  mseconds is an indication for cardiac referral.

The term “**Faint**” should be reserved for a vasovagal episode, usually in younger patients. It is usually preceded by nausea, vomiting, and sweating and often relates to some kind of situational stress. Some patients who faint will have a very brief convulsion especially if not allowed to lie flat.

A “**Drop Attack**” is a sudden falling to ground without loss of consciousness. Usually caused by a balance problem or postural hypotension.

A **seizure** may be ‘generalised’ or ‘partial’ (+/- complex). A change to fit pattern usually merits admission to the medical ward. Beware of the post-ictal patient who has not fully recovered - always observe for a while and mobilise prior to discharge. Don’t forget to exclude injury - skull fracture and dislocated shoulder are the commonest.

## HEADACHES (SEE MENINGOCOCCAL DISEASE)

Be careful of this presentation to Emergency Department. All patients (including those who have had a CT scan) should be reviewed by GP, if not admitted. Temp, fundoscopy and BP are always mandatory.

### Red flag symptoms

- Worst ever headache
- Sudden onset - maximum intensity within one hour
- Prolonged headache
- Vomiting more than once
- Fainting/collapse
- New neurological deficit
- New cognitive dysfunction
- Headache with pyrexia

These 'Red Flag' symptoms are very significant – CT Scan is usually required.

### Don't miss:

- Sub-arachnoid haemorrhage (usually sudden onset; reaches maximum intensity within 60 mins)
- Meningitis (fever and/or rash)
- Encephalitis (fever, ataxia, drowsiness/confusion)
- Raised ICP (CNS signs or papilloedema, typical symptoms)
- Temporal arteritis (older patients -check ESR if age >60)
- Acute closed angle glaucoma (headache, red eye, visual disturbance, nausea)

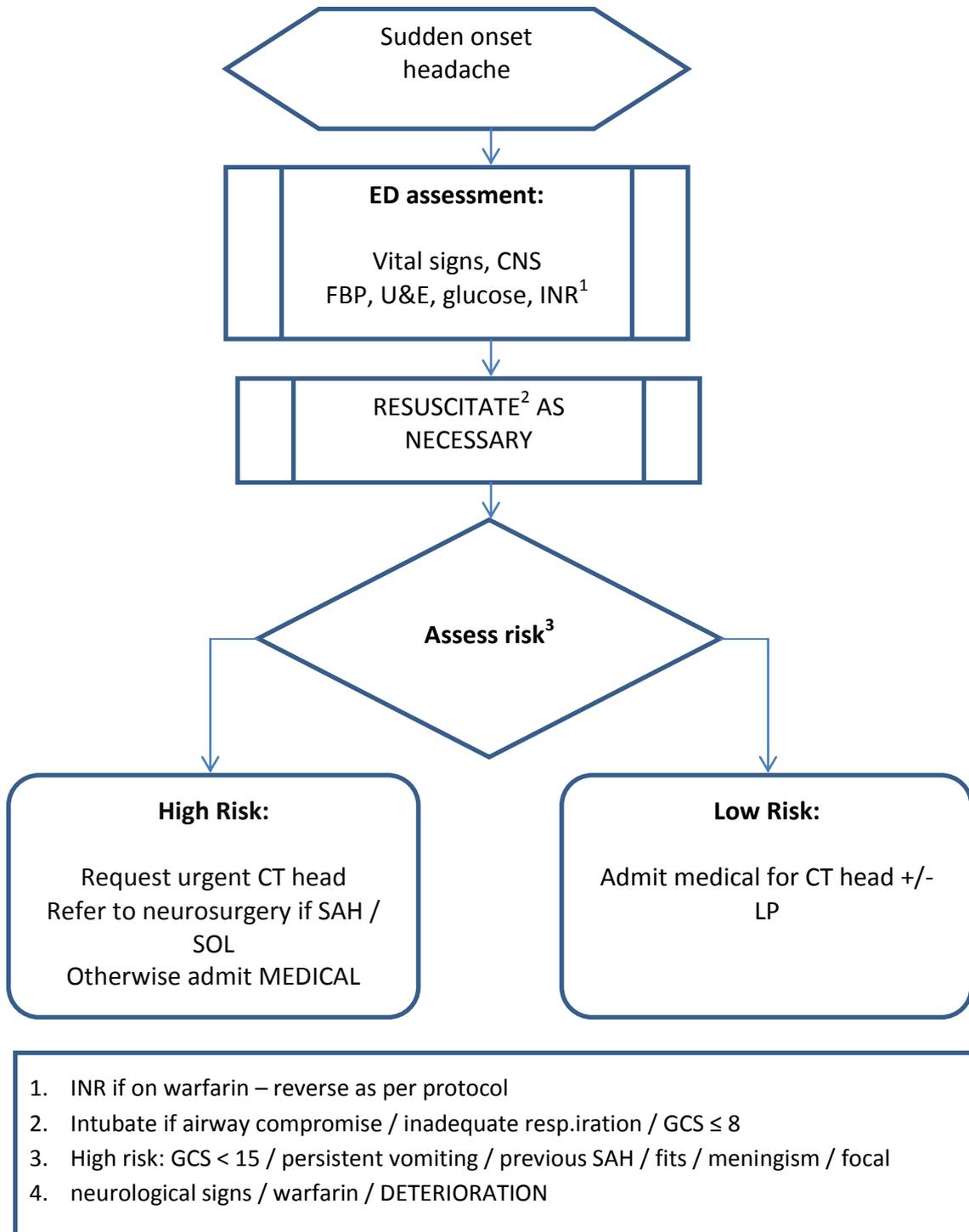
Common causes are migraine, neck problems and "tension". If a patient has symptoms suggesting **migraine** and there are no contra-indications, use "Imigran" subcutaneously and re-evaluate after 30 mins. Alternatively a combination of IV fluids, high flow oxygen, aspirin 900mg PO, chlorphenamine 10mg IV and antiemetic can be useful. Todd's paresis is a senior clinician diagnosis.

For patients with **cluster headaches** (severe migraine-type headaches with nasal stuffiness and lacrimation that come in "clusters" lasting several days) 100% oxygen via NRRM may produce a dramatic improvement.

A normal CT scan does not rule out sub-arachnoid haemorrhage and sensitivity decreases with time – Day 1 95% sensitivity, day 7 50% sensitivity.

If sub-**arachnoid haemorrhage** is the working diagnosis then the patient will need to be admitted medically for lumbar puncture.

### Sudden Onset Headache Pathway



## STROKE

- Consider all patients who present within 3.5 hours from onset of stroke symptoms for lysis

### **1. Hyperacute Stroke**

There is now good evidence that emergency lysis of hyperacute THROMBOTIC stroke within 3.5 hours of onset of attack is of significant benefit to SELECTED patients.

This makes assessment of suspected acute stroke a top priority medical emergency.

The steps below should be taken SIMULTANEOUSLY as far as possible:

#### **Emergency Management of Suspected Hyperacute Stroke**

- Pre- alert the stroke team (bleep 6000) if standby call or alert if Rosier positive (see below)
- Resuscitation (ABC including 100% O<sub>2</sub> and iv fluids, urinary catheter. Urgent Coag, FBP and U&E )
- Consider / correct reversible causes e.g. hypoglycaemia that may be mimicking a stroke
- Identify cause of stroke i.e. Ischaemic or Haemorrhagic? (emergency CT scan phone ROD – ask about warfarin, heparin/ bleeding disorders )

#### **a) Stroke Team**

- Contact via fast bleep 6000 and ask for stroke lysis team (24 hours a day)
- In hours this service is provided by a dedicated stroke team.
- Out of hours this will initially be the Medical SpR who will liaise with the on-call stroke consultant
- The stroke team will determine appropriateness of lysis

**b) Rosier Score**

- |   |            |
|---|------------|
| 1. Has there been loss of consciousness or syncope? | Y(-1) N(0) |
| 2. Has there been seizure activity?                 | Y(-1) N(0) |

Is there is a NEW ACUTE onset (or on awakening from sleep)

- |                               |            |
|-------------------------------|------------|
| i. Asymmetric facial weakness | Y(+1) N(0) |
| ii. Asymmetric arm weakness   | Y(+1) N(0) |
| iii. Asymmetric leg weakness  | Y(+1) N(0) |
| iv. Speech disturbance        | Y(+1) N(0) |
| v. Visual field defect        | Y(+1) N(0) |

\*Total score \_\_\_\_\_ (-2 to +5)

If score is +1 or above assess suitability for Thrombolysis and complete the assessment overleaf.

*N.B. Stroke unlikely but not completely excluded if total scores are below 0.*

**c) Stroke Lysis**

Consent should be gained by the stroke team and lysis given by the stroke team. The dose of rt-PA (alteplase) for acute stroke is 0.9mg/kg, maximum 90mg. 10% of the dose is given by i.v. bolus injection and the remainder by iv infusion over 60 minutes. See BNF – not recommended for patients aged 80 and over.

**e) After care**

Patients require close observation and nursing and continuous monitoring following lysis. They should be moved to an appropriate bed in CCU as soon as possible. If any deterioration, contact the stroke team/medical SpR.

**2. Other stroke patients**

Even if they are not eligible for lysis, stroke patient will benefit from the other evidence based interventions

- iv fluids/Fluid Balance Chart and nil orally until swallowing has been assessed
- temperature regulation- paracetamol if temp>37.5
- blood glucose regulation- sliding scale insulin

- blood pressure control- over next 24hrs (*not acutely*)
- early admission to a Stroke Unit

### When to order an urgent CT scan?

- Diagnosis in doubt
- Suspected SAH
- Suspected hydrocephalus 2<sup>o</sup> to CVA
- On warfarin or heparin (or coagulopathy)
- Acutely deteriorating
- >48 hours since onset

## TRANSIENT ISCHAEMIC ATTACK

Like stroke, TIA is the result of carotid- or vertebro-basilar territory ischaemia. It is common in older patients but it can occasionally occur in the young, usually due to an undiagnosed cardiac lesion or thrombophilia. Migraine or Todd's paresis can mimic stroke but this is a diagnosis for a senior clinician only.

TIA is abrupt in onset, focal and completely resolved within 24hours. The signs fall within a vascular territory such that there are negative symptoms i.e. something is absent.

Patients who have persistent neurology and signs, new AF or cardiac murmurs, significant hypertension or are high risk should be admitted.

### a) Risk Assessment 'ABCD<sup>2</sup> score'

Indicator	2	1	0
Age	-	> 60 yrs	-
BP	-	SBP >140 or DBP >90	-
Clinical features	Unilateral weakness	Speech disturbance alone	other
Duration	> 60 mins	10 – 59 mins	< 10 mins
Diabetes	-	Present	-

### **b) Admission**

- ABCD<sup>2</sup> score greater than 6 or if weekend
- Patients who still have symptoms
- Patients who have had a number of resolving TIA's in the days prior should be CT scanned and admitted.
- Patients on Warfarin should be admitted.

**c) TIA Clinic**

Fax the referral to Consultant Physician c/o Mrs Kathryn Williamson at --- 02825635237, marking it "TIA CLINIC".

Commence ASPIRIN and STATIN

Advise the patient they are NOT allowed to drive until seen in clinic (and document in notes)



**CREST SUMMARY OF MANAGEMENT OF TRANSIENT ISCHAEMIC ATTACK (TIA) IN PRIMARY CARE\***

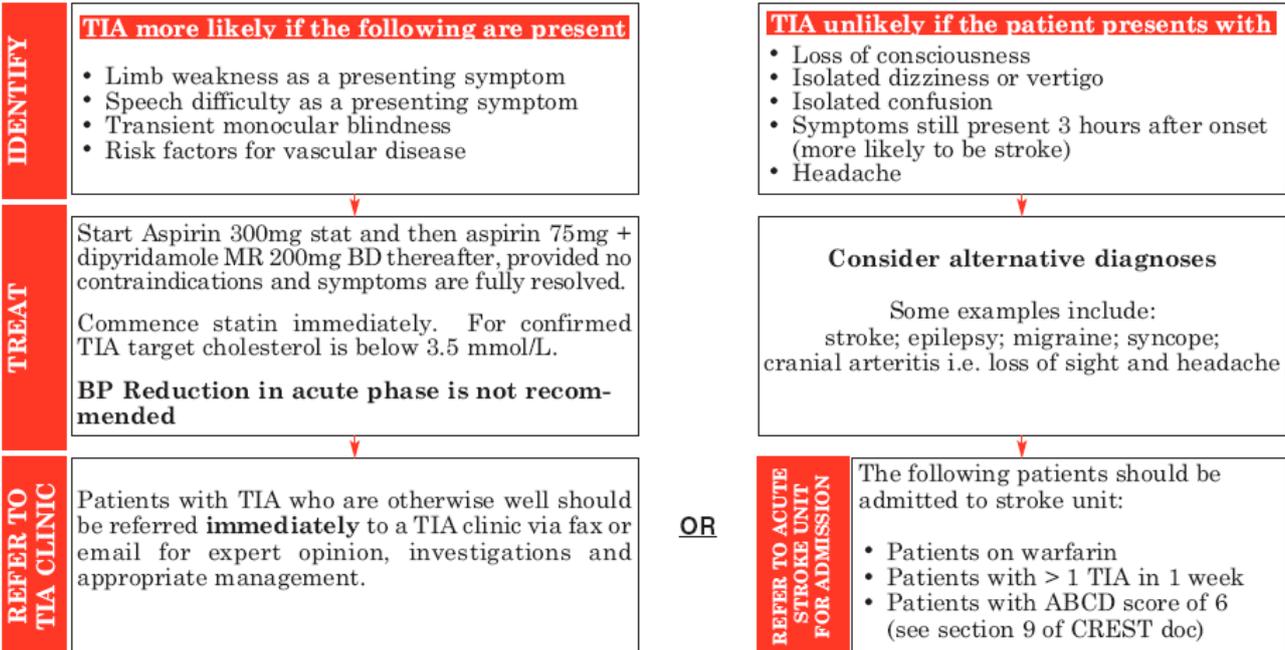
**Definition**

A transient ischaemic attack is a clinical syndrome characterised by an acute loss of focal cerebral or monocular function with symptoms usually lasting less than 30 minutes and attributable to inadequate blood supply.

**Risk of Stroke after TIA**

8% of patients with TIA will have a stroke within 7 days of event, half of these occur within the first 48 hours.  
**Urgent intervention is necessary to reduce the risk.**

**THE HISTORY OF THE EVENT IS CRUCIAL IN MAKING THE DIAGNOSIS**



\*Adapted from EHSSB stroke strategy implementation project guidance

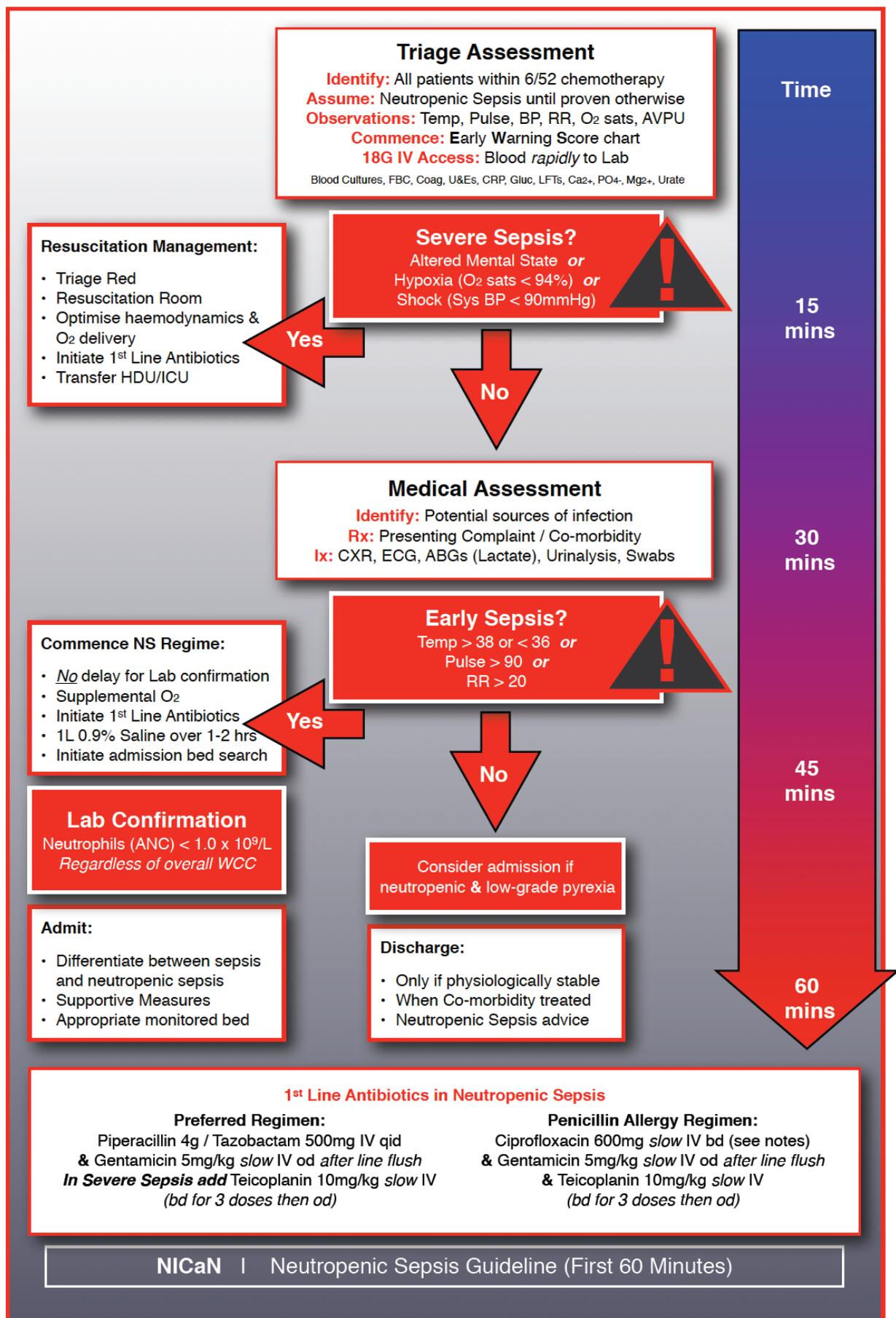
## CANCER PATIENTS & CHEMOTHERAPY

***All patients who develop illness post chemotherapy should be directly admitted to either a medical or surgical ward; they should not come through the Emergency Department UNLESS REQUIRING RESUSCITATION***

**The commonest oncologic emergencies are:-**

- *Neutropenic-induced sepsis* –GUIDELINE ON FOLLOWING PAGE
- *Hypercalcaemia* – rehydration with iv saline and administration of iv Frusemide.
- *Renal failure* –check U&E, ECG, renal consult.
- *Cardiac or GI toxicity post chemo*– treat according to presentation.
- *SVC obstruction* (presenting with upper airway obstruction, jugular venous distention, dilated veins in the upper body, cyanosis, cough, chest pain) – emergency oncology consult re DXRT.
- *Spinal cord compression* – emergency oncology consult who will guide you to the next appropriate steps

The regional handout on management of common post -chemotherapy symptoms is available in the computer room. You can also ask for advice from the oncology trainee-on call in Belfast City Hospital or from the on-call Emergency Department consultant. Some patients are transferred direct to BCH following consultation with them.



## METASTATIC SPINAL CORD COMPRESSION

**For patients with known history of cancer contact oncology registrar 02890329241 in the Cancer Centre**

**For patients with no known history of cancer, for a surgical opinion phone Fracture Clinic 02890632925 / 08290633133 and ask for ortho SHO**

### **Assessment**

1. History:
  - Malignancy
  - Time of onset of symptoms
2. Examination:
  - Walking – normal / unsteady / non-ambulant
  - Incontinence – urinary / faecal
  - Sensory level
  - Motor deficit
  - Able to lift leg off bed – right / left
3. Spinal instability – markers of potential spinal instability include:
  - Severe pain at site of lesion
  - Worsening neurology
  - > 50% collapse of vertebral body
  - Destruction of odontoid process

### **Management**

1. Bed rest and log roll all patients in the ED with possible or confirmed MSCC
2. Contact oncology SpR / fracture SHO as appropriate (see above for details)
3. Admit under medical team if out of hours

## PALLIATIVE CARE

You can obtain help with any aspect of a complex palliative care problem by calling the out-of-hours on-call Consultant in Palliative Medicine (24/7 via switchboard) or by bleeping the Macmillan nurses who are available 9am to 5pm Mon-Fri.

Guidance on the management of breakthrough symptoms in the terminally ill patient

FIRST EXCLUDE A TREATABLE CAUSE (see previous page)!

All are given by subcutaneous injection unless otherwise stated.

DRUG	DOSE	SYMPTOMS
Diamorphine	<i>On diamorphine:</i> 1/6 of total 24hr dose (max: 25mg) <i>On morphine:</i> 1/18 of total 24hr dose (max: 25mg) <i>On fentanyl patch:</i> (patch dose)/ 5 mg = dose of diamorphine (max 25mg) Not on an opiate: 5-10mg	Pain
	2.5-5mg	Breathlessness
Midazolam	2.5-5mg 5-10mg 5-20mg 5-20mg (iv titrate) 30mg/24hrs (sc infusion)	Breathlessness + anxiety Myoclonic jerks Terminal agitation Severe haemorrhage Seizures
Diazepam	10mg (rectal)	Seizures
Haloperidol Cyclizine Metoclopramide Levomepromazine	1-2.5mg 50mg 10-20mg 12.5-25mg	Nausea/vomiting
Hyoscine	0.4-0.6mg	"Death rattle"

## POISONING (SEE ALSO DELIBERATE SELF HARM, LEGAL ISSUES)

- **Always** check Toxbase for the most up to date information in managing specific poisonings.
- <https://www.toxbase.org/>

User name: **H175**  
Password: **88WMEG**

- *Many common poisons can be screened for by the Lab – be specific in your request.*

### General Management

- Activated charcoal should be given to patients presenting within 1 hour of ingesting drugs unless unable to protect their airway (e.g. decreased GCS) or drugs not affected by charcoal (petroleum distillates, corrosive substances, alcohol, Malathion, heavy metals)
- Toxbase printout for every patient
- Bloods and ECG as per Toxbase guideline
- Consider context: industrial hazard vs accidental vs deliberate and manage accordingly

### Paracetamol

- Paracetamol poisoning has a significant mortality and morbidity.
- Check levels at 4 hours (or on presentation if after this)
- Treat according to graph in BNF or Toxbase – note: there has been a change in recent years and there is no longer a distinction between high or low risk patients, the treatment line has been adjusted to account for this.
- If patients present after 8 hours with a significant paracetamol overdose or after a staggered overdose should have acetylcysteine commenced immediately while waiting on blood results.
- Acetylsyteine dose is dependent on patient's weight & is prescribed in mls of solution to avoid prescription errors.
- These patients should be admitted to the Obs ward for treatment unless there is evidence of liver damage clinically or on bloods in which case admit medically.

**Cyanide**

Cyanide is produced in a local factory and may also contaminate ships' cargoes etc. Cyanide poisoning presents with agitation, headache, coma, pulmonary oedema, arrhythmias and shock. There is no time to lose. Use the Cyanide treatment kit that is kept in resuscitation, starting with inhaled amyl nitrate to buy a few extra moments – Get senior help AT ONCE. Consider in cardiac arrest following smoke inhalation.

An exhaustive list of poisons management is beyond the scope of this book – this is available to you on Toxbase ([www.toxbase.org](http://www.toxbase.org))

**IMMEDIATELY LIFE-THREATENING POISONS**

Life-threatening Ecstasy Poisoning presents with hyperpyrexia(>39) and collapse. Be vigilant about this diagnosis – there will often be muscle rigidity and hyper-reflexia as well. Get Consultant/senior anaesthetic help immediately. Start vigorous cooling measures immediately.

**DIABETIC PATIENTS**

**1. DKA and HONK**

- *These notes are from the Trust Adult DKA and HONK protocol - use the Intranet and follow the TRUST PROTOCOL (this is a treatment pathway and prescription)*
- *Patients under 18 years MUST be treated using the Paediatric DKA guidelines*

**Diagnostic Criteria**

<b>Diabetic Ketoacidosis</b>	<b>Hyperosmolar non-ketotic state</b>
<ul style="list-style-type: none"> <li>• Venous bicarbonate &lt;15 mmol/L * (bicarbonate can be requested on U&amp;E form)</li> <li>• Urine ketones ++ or more</li> </ul> <p>* measure arterial blood gasses if patient has reduced conscious level or respiratory distress.</p>	<ul style="list-style-type: none"> <li>• Serum osmolality &gt;350 mosmol (2 [sodium+potassium] + blood glucose)</li> <li>• Venous bicarbonate &gt;15 mmol/L</li> <li>• Urine ketones + or less</li> </ul>

**Early management – intravenous infusion fluids / potassium / insulin****Infusion fluids (prescribe on fluid balance chart)**

- Give 1 litre sodium chloride 0.9% immediately during the first hour.
- If hypotension does not respond to sodium chloride 0.9%, give a plasma expander.
- Rate of fluids thereafter depends on age / fitness / dehydration of patient, consider central venous pressure line,  
Rate typically:     1 litre over next hour  
                          2 litres over next 2-4 hours  
                          then 1 litre 4-6 hourly
- Reduce rate in elderly/cardiac disease/mild DKA (bicarbonate >10). More rapid infusion increases risk of pulmonary oedema.
- Switch to glucose 5% 1 litre 8 hourly once blood glucose <15 mmol/L. Continue simultaneous sodium chloride 0.9% if still volume depleted.
- If serum sodium rises above 155 mmol/L, switch to sodium chloride 0.45% (of glucose 5% if blood glucose <15).

**Potassium (prescribe on fluid balance chart)**

- Serum potassium is often normal or high initially but total body potassium is low.
- Anticipate fall in potassium and replace by switching infusion fluid to a potassium containing infusion, once first plasma potassium result is known.
- Administer potassium containing infusion as follows:
  - Serum potassium >5.5mmol/L:   no additional potassium required, check in 2 hours
  - Serum potassium 4-4.5mmol/L:   20mmol potassium in each litre of infusion fluid
  - Serum potassium <4mmol/L:     40mmol potassium in each litre of infusion fluid

**Insulin**

- Insulin must be referenced on the main Kardex by prescribing Actrapid infusion 'as per chart'.
- Commence soluble insulin infusion (50 units/50 ml) via syringe driver, starting at 6 units/hour.
- Measure capillary blood glucose hourly using blood glucose meter. Once glucose <16, adjust insulin infusion rate according to algorithm overleaf.
- Check laboratory venous blood glucose result at 2 hours. If blood glucose has not fallen, check pump working and intravenous connections secure, then increase insulin infusion to 10 units/hour. Discontinue previous column and prescribe alternative algorithm.

**Other measures**

- Consider urinary catheter if no urine passed after 2 hours or incontinent.
- Consider nasogastric tube and aspiration if patient not responded to commands (NDB protect airway, discuss with ICU).
- Prescribe thromboprophylaxis on Kardex unless contraindicated.
- Screen for infection and other precipitating factors.
- Continue intravenous insulin and fluids until acidosis reversed and patient ready to eat and drink. Discontinue intravenous insulin and then re-start subcutaneous insulin according to guidelines.
- Long acting analogue insulin should not be omitted.

**Intravenous bicarbonate**

- In most cases administration of intravenous bicarbonate is not helpful and is potentially dangerous.
- Only consider if pH <6.9 and poor response to fluid resuscitation; refer to ICU.

**Intravenous insulin infusion**

Capillary blood glucose (mmol/L)	Standard insulin infusion rate (units/hr)
>16	6
12.1 – 16	4
10.1 – 12	3
7.1 – 10	2
4 – 7	1
<4	0.5

**Administration and monitoring record**

- Start recording at the start time of the infusion. Protocol chart is valid from 9am until 9am the following day.
- Measure capillary blood glucose every hour. Capillary blood glucose results must also be recorded on the observation chart.
- Measure U&E, pH and venous bicarbonate at 2 hours, then 2-4 hourly until bicarbonate >15

Don't forget that DKA may present as a hyperventilation attack or abdominal pain in adults or children with no history of Diabetes.

**2. Hyperglycaemia without impaired consciousness**

Patients (either newly or previously diagnosed DM) who present with hyperglycaemia +/- symptoms but with normal level of consciousness and no acidosis do not have DKA or HONK! They do not require admission unless

there is an intercurrent illness or some specific problem with diabetic control. They should be booked into next diabetic clinic (within one week). Review and manage their insulin therapy before discharge – seek help if necessary.

### **3. Hypoglycaemia**

Nowadays most cases come by ambulance and will have received im Glucagon that usually works within 15 mins (if you are sending bloods tell lab that Glucagon has been given!). If the patient presents in coma/unable to take glucose by mouth give 50mls of 50% dextrose (5ml/kg of 10% dextrose for children). Can be discharged if able to eat and social support. Consider cause and give advice or review and manage their insulin therapy.

#### Special pitfalls for diabetic patients

- All diabetic patients with foot wounds or minor sepsis must be reviewed at treatment room or ARC. High risk of osteomyelitis. Consider immediate / early referral to podiatrist.
- Remember silent myocardial infarction – check ECG in diabetic patients with non-specific illness
- All diabetic patients with acute abdominal pain should be admit

## EAR CONDITIONS

- **Foreign body in child's ear -**  
It's tempting to try but only remove if visible and child co-operative. Check TM afterwards.
- **Otitis externa**  
Often requires strong analgesia  
Insert pope ear wick for 24-48hrs  
Antibiotic/steroid drops e.g. Betnesol-N for 7 days only (risk of ototoxicity if use prolonged in presence of TM perforation).  
Refer severe cases to ENT for aural toilet.  
Review by GP.
- **Otitis media**  
Strong analgesia.  
Oral antibiotics (see protocol).  
Always review by GP to ensure resolution.
- **Traumatic TM perforation**  
Keep ear dry.  
No antibiotics required.  
GP to arrange ENT review within a few weeks.

## BELLS PALSY

*i.e., idiopathic LMN VIIth (facial) nerve palsy involving entire half of face*

Examination:

- Exclude other cranial nerve involvement.
- Examine throat and ear for herpetic vesicles or middle ear infection.
- Examine for serious underlying pathology e.g. Lyme disease, parotid tumour

Treatment:

- Prednisolone 40mg daily and 5 day course of oral Acyclovir
- Eye protection with artificial tears or Lacrilube gel and eye patch at night (if unable to close eye).
- Discuss with ENT doctor for review in 3-5 days and
- 80-90% full recovery expected for uncomplicated Bell's.
- Refer to ENT clinic for review in 5-6 weeks (this can be arranged by ED reception staff)

## NASAL CONDITIONS

### Displaced nasal fractures

- Clinical diagnosis – X-rays not indicated
- Refer to ENT clinic by giving appointment card marked “ENT appointment in 5-7 days” to the patient and send them to the ED reception.
- Look for septal haematoma and refer urgently if present.

### Epistaxis

- Pack nose lightly with 4% Lignocaine/Adrenaline (bottle in fridge) on ribbon gauze for 5-10 mins.
- Remove pack and examine nose; if bleeding point seen, apply silver nitrate cautery stick 10-15 secs to that area.
- **Children (anterior bleeds more common)**  
Children with recurrent minor nose bleeds often respond to a 7 day course of antibiotic cream, e.g., Naseptin.
- **Elderly patients (posterior bleeds more common)**  
Those on Warfarin/Aspirin and those with prolonged or recurrent bleeds, require definitive treatment, i.e., cautery. Check BP, FBP and INR when indicated.

Refer to ENT on-call (not clinic) as necessary.

## THROAT CONDITIONS

**Partial upper airway obstruction (stridor). DON'T TOUCH!** Notify both anaesthetist and ENT. (Simple Croup is an exception – give a ‘Pulmicort’ nebuler and refer to paediatrics).

**Patients with quinsy** have severe pain, trouble with swallowing or opening mouth. Give im Voltarol and contact ENT.

**Tonsillitis** – see antibiotic protocol, may benefit from steroids +/- Obs ward admission.

**FB in throat.** Check back of throat for visible FB. X-ray for opaque FB. If clinical suspicion or positive x-ray, speak to ENT.

**Bleeding post-tonsillectomy** -Resuscitate and refer to ENT for ADMISSION IV antibiotic, e.g., Co-Amoxiclav.  
Do not remove clot in tonsil bed!

**Ludwigs angina-** bilateral cellulitis of the submandibular space. Painful oedema progressing to trismus, dysphagia, drooling and subsequent airway obstruction. Treatment requires Analgesia, Antibiotics (high dose) and Airway Assessment if severe. ADMIT.

**Children who swallow coins etc.** Do Chest and neck x-ray. If coin (or other inert F.B.) above diaphragm speak to ENT. If coin below diaphragm, reassure and discharge. No review unless abdominal symptoms (rare). Patients who have ingested batteries or other corrosive items should be referred urgently.

- Always check visual acuity
- Apply amethocaine 1% drops for corneal discomfort
- Slit lamp examination for all suspected corneal problems
- Examine using ophthalmoscope any patients with visual disturbance
- X-ray of orbits for all patients with a history of potential penetrating intra-ocular (small F.B. striking eye at high velocity). N.B.: steel striking steel (e.g. hammer and chisel) is particularly hazardous.

## EYE PROBLEMS

### Patients requiring immediate ophthalmic assessment

- Significant visual loss
- Severe eye pain
- Penetrating ocular trauma and lid lacerations
- Post-operative red or painful eye

These patients should be referred to the ophthalmology SHO on-call or eye casualty in RVH **Phone 90634706**

### Patients requiring early (within 24 hrs) referral to the Eyes Clinic:

- Iritis (pain, photophobia, circumcorneal red eye, cloudy cornea)
- Retinal detachment (flashes, curtains, post-traumatic visual upset)
- Hyphaema
- Dendritic ulcers (pain, photophobia, staining lesion on cornea)
- Alkali chemical burns

Contact RVH ophthalmology SHO for appointment in Eye Casualty

**Conditions suitable for ED management:**

- Corneal foreign body (remove with cotton bud or orange needle, don't forget to evert upper lid)
- Conjunctivitis (chloramphenicol ointment four times daily for five days)
- Corneal abrasion including abrasions caused by foreign body removal (cyclopentolate, chloramphenicol and voltarol drops applied stat, then eye pad)
- Non-alkali Chemical burn (check pH, irrigate immediately with several litres of normal saline until pH returns to neutral, remembering to evert upper lid. Refer to ophthalmology SHO if unable to normalise pH)
- Welder's flash (amethocaine 1%, cyclopentolate and voltarol drops, chloramphenicol, double eye pad and bandage)

**Conditions that should be reviewed at the Emergency Department:**

- Corneal abrasion causing reduced visual acuity (5 days)
- Rust ring if over the pupil (5 days)
- Non-alkali chemical burn (next day)
- Welder's flash if not settling

## INFECTIOUS DISEASES

### Antimicrobial Treatment

This Trust operates Antimicrobial cycling. Please refer to the Empirical Antimicrobial Guidelines for hospitalised adults. It does not apply to oral medication or patients discharged from the ED.

### Isolation

- **SARS and FLU EPIDEMICS:**

Any patient presenting with respiratory symptoms, flu-like symptoms or diarrhoea and who has been in an affected area during the ten days prior to attending must be isolated and treated according to the current protocol held in ED. (Vigilance is essential)

- **VIRAL HAEMORRHAGIC DISEASE:**

There has been a recent outbreak of Ebola in Guinea, Liberia and Sierra Leone. It is unlikely, but not impossible, that travellers could arrive in the UK while incubating the disease (incubation period 2 to 21 days). Suspect if symptoms of fever, headache, sore throat or general malaise within 21 days of visiting affected area (or caring for high risk person). The patient must be isolated and treated as per the HPA algorithm (see next page).

- **Isolation of other infections you may encounter in the ED:**

- Diarrhoea and/or vomiting
- Undiagnosed rashes & fevers as well as measles, rubella, mumps
- Newly diagnosed or suspected “open” TB
- Suspected Group A strep infection
- Patients shredding antimicrobial resistant microorganisms: e.g. MRSA, GRE, aminoglycoside-resistant Gram-negative organisms
- Inter-hospital transfers known to be colonised with resistant bacteria
- Bronchiolitis
- Chicken pox and shingles
- This is not an exhaustive list – refer to *The Northern Ireland Regional Infection Prevention and Control Manual*.  
[www.infectioncontrolmanual.co.ni](http://www.infectioncontrolmanual.co.ni)

- *Use standard precautions for all patients – this includes good hand hygiene and use of protective clothing (e.g. gloves and aprons)*



## MENINGOCOCCAL DISEASE - ADULTS

### Presentation

Can be divided into four groups:

- Meningococcal Septic Shock
- Meningitis
- Both of above
- Non-specific: arthralgia, rash, collapse or confusion/psychosis

The typical rash is non-blanching but there may be any or no rash!

### Treatment

- ABC – O<sub>2</sub> NRRM
- Vigorous resuscitation with IV crystalloid + colloid
  
- Meningitis with typical rash  
= Benzylpenicillin 2.4g IV 4 hourly
  
- Meningitis without typical rash < 55 yrs old  
= cefotaxime 2g IV 6 hourly OR Ceftriaxone 2g IV 12 hourly  
Add Amoxicillin 2g IV 4 hourly if > 55 yrs, immunocompromised or pregnant
  
- Meningitis with clear history of anaphylaxis to penicillin/cephalosporin  
= chloramphenicol 25mg/kg IV 6 hourly + co-trimazole 1.44g IV 12 hourly if > 55 yrs old.
  
- Notify Anaesthetist and inpatient medical team
  
- Ensure that Public Health are notified (immediate family will need prophylaxis). Ciprofloxacin stat dose recommended.

## TOXIC SHOCK SYNDROME

Organisms:	Gram positive bacteria - Usually Staphylococcal. Occasionally streptococcal
Presentation:	Fever >38.9 Hypotension Macular Rash (mucous membrane involvement) Diarrhoea Cardiovascular Collapse
Treatment:	supportive and high-dose flucloxacillin

## SEPTIC SHOCK - SEE ALSO RESUSCITATION

Organisms:	Usually caused by pneumococci or gram negative organisms.
Presentation:	Focus of infection (may not be apparent initially) SIRS: Temp >38.3 or <36 HR >90 RR >20 WCC >12, 000 or < 4,000 /mm <sup>3</sup>
Management:	Recognise early & seek advice Give oxygen 100% via NRRM Give N saline 1 litre rapidly and monitor response – (repeat further fluids if necessary) Check Blood Cultures Give empiric antibiotics (see Trust Policy) Catheterise bladder and measure urine output FBP, coag, ABG, U&E, glucose, lactate, CRP, LFT Perform ECG and CXR Refer to medical team for ADMISSION +/- ICU

## CELLULITIS - LOWER LEG

Organisms:	<i>Usually streptococcal</i> Occasionally staphylococcal More rarely may involve gram negative organisms if complicating a significant wound May be polymicrobial if occurring in patients with diabetic foot disease
Risk Factors:	<i>Athlete's foot (recurrent disease)</i> Lymphoedema Varicose eczema Obesity Diagnosis Malaise and fever
Presentation:	Progressive painful swelling and erythema Usually unilateral but can be bilateral
Differential:	Lower leg eczema – itchy, non tender Acute oedema/blisters – usually bilateral Chronic lymphoedema – usually bilateral, well DVT – see earlier section on DVT Peripheral vascular disease – delayed CRT Compartment syndrome – sharply localised and extreme tenderness Vasculitis – usually bilateral, mainly anterior shin Necrotising fasciitis – severe pain, toxic

- Investigation: FBP, ASOT(if present>10days), Blood cultures (if Temp >38.5)  
U&E, LFTs if unwell and Streptococcal Toxic Shock Syndrome suspected
- Treatment: Admission rarely required unless severe, antibiotic resistant or co-morbidity  
Ceftriaxone via HDT for 48 hours if non-responding to oral antibiotics or severe at presentation  
Affected areas should be elevated if possible  
Failed treatment with above -seek senior advice  
Consider admission to Obs ward for overnight Abx and senior review if concerned about patient  
Avoid NSAIDs (associated with higher incidence of Necrotising Fasciitis)

*Refer suspected Necrotising Fasciitis to surgeons immediately: ill septic patient, rapidly progressive skin change and severe pain are all pointers to this diagnosis*

## MANAGEMENT OF SUSPECTED INFECTIVE GASTROENTERITIS

This applies to all adult patients with non-specific vomiting and/or diarrhoea. C Difficile Toxin should be checked and if positive (or has been positive within 12 weeks of presentation) must be isolated according to Trust Protocol.

1. Assessment should take place in the isolation room unless definitely not a gastroenteritis case (e.g. vomiting due to MI)
2. The patient should have a full doctor's assessment to exclude surgical/non-infective cause for symptoms (i.e. pancreatitis, obstruction etc).
3. Faeces should be sent to lab urgently for C/S if possible
4. If a surgical cause for the illness is excluded the patient's state of hydration should be assessed (including U&E) *and*
5. Re-hydration using dioralyte or IV fluids as tolerated.

### **Patient can be discharged if**

- tolerating oral fluids,
- mobile,
- passing urine
- suitable home circumstances

give infection precaution advice if discharging (if employed in food -handling refer to GP)

## IMMUNISATION ENQUIRIES AND INFECTION EXPOSURE (SEE ALSO NEEDLESTICK INJURIES, TETANUS)

*Don't guess the answer - You must check the Green Book ("Immunisation against Infectious Diseases" 2006) every time.*

### Post Vaccination Problems

Usually affect children and may present to the Emergency Department or helpline. Specific guidelines are given in the Green Book and in the BNF.

### Requests for emergency immunisation

Patients may present to the Emergency Department or phone on helpline. Check green book and get senior advice (e.g. Rabies, Hep B, usually from travellers or Varicella Zoster following exposure during pregnancy).

Urgent active +/- passive immunisation may be required. Blood titres may need to be taken.

Northern Ireland's Public Health Supplies are accessed via the on-call microbiologist at BCH.

## Tetanus Prophylaxis

Table 30.1 Immunisation recommendations for clean and tetanus-prone wounds

IMMUNISATION STATUS	CLEAN WOUND	TETANUS-PRONE WOUND	
	Vaccine	Vaccine	Human tetanus immunoglobulin
Fully immunised, i.e. has received a total of five doses of vaccine at appropriate intervals	None required	None required	Only if high risk (see p 379)
Primary immunisation complete, boosters incomplete but up to date	None required (unless next dose due soon and convenient to give now)	None required (unless next dose due soon and convenient to give now)	Only if high risk (see p 379)
Primary immunisation incomplete or boosters not up to date	A reinforcing dose of vaccine and further doses as required to complete the recommended schedule (to ensure future immunity)	A reinforcing dose of vaccine and further doses as required to complete the recommended schedule (to ensure future immunity)	Yes: one dose of human tetanus immunoglobulin in a different site
Not immunised or immunisation status not known or uncertain	An immediate dose of vaccine followed, if records confirm the need, by completion of a full five-dose course to ensure future immunity	An immediate dose of vaccine followed, if records confirm the need, by completion of a full five-dose course to ensure future immunity	Yes: one dose of human tetanus immunoglobulin in a different site

**Tetanus-prone wounds include:**

- wounds or burns that require surgical intervention that is delayed for more than six hours
- wounds or burns that show a significant degree of devitalised tissue or a puncture-type injury, particularly where there has been contact with soil or manure
- wounds containing foreign bodies
- compound fractures
- wounds or burns in patients who have systemic sepsis.

**Management:**

Prevention is key – clean and debride wound

Vaccine +/- immunoglobulin as in table above.

Antibiotics as required

## MANAGING SUSPECTED EXPOSURE TO HIV AND HEPATITIS VIRUSES

*Each case of suspected Blood Borne Virus (BBV) exposure is different – judgement and experience are essential. Contact an experienced Emergency Department doctor or the Occupational Health nurse for advice.*

The commonest scenarios that you will encounter will be:

- **Healthcare workers** – usually after needlestick injury. ALL should be followed up by OCCUPATIONAL HEALTH. Follow the Trust Sharps Injuries Policy found on the intranet.
- **Other occupational exposure** – eg police, council workers (“binmen” etc) who should all be followed up at their employer’s Occupational Health Department or GP to refer to GUM for follow-up.
- **General Public** – eg children playing with needles (iv drug abuse is common in this area), people who have sustained bites and scratches. All should be followed up by their GP who should receive a detailed discharge letter from you.

**Step One: Immediate Action**

- First aid measure: wash wound well and encourage free bleeding, irrigate affected mucous membrane with water
- Reporting: Sharps injury should be reported to the person in charge / line manager. Within normal working hours it should then be reported via telephone to Occupational Health. Outside normal working hours the health care professional will report to the ED after risk assessment has been completed at source.

## Step Two: Risk Assessment – information gathering

- Risk Assessment: risk assessment of the source patient (if known) must be carried out as soon as possible, ideally within 30 minutes of the incident. This should be carried out by a clinician with clinical responsibility for the patient (inpatient team or GP if in community) – NOT the ED staff.

### 1. Assess the risk of the Source patient:

The donor is classified as high risk if he/she is in one of the following categories -

- known seropositive Hepatitis or HIV
- history of IV drug abuse
- homosexual, bisexual or sex industry worker
- from an endemic area (e.g. South East Asia - hepatitis B, parts of the African Continent - HIV)
- sexual contact with a high risk person

### 2. Assess the risk of the fluid or tissue

The following contaminating fluids or tissue are classified as high risk-

- blood or any blood-stained fluid
- breast milk, amniotic fluid, vaginal secretions or semen
- peritoneal, pericardial or pleural fluid
- synovial fluid or CSF
- saliva in association with dentistry
- any tissue (unless already “fixed”)

### 3. Assess the risk of the exposure

The following types of exposure are classified as high risk -

- needlestick or other percutaneous exposure (3 in 1,000 for HIV)
- exposure to broken skin
- mucous membrane (<1 in 1,000 for HIV)

### 4. Recipient factors

Previous immunisation status

Known Hep B Vaccine non-responder

### 5. Unknown source

If there has been a significant exposure and a source patient cannot be identified, risk assessment should be on an individual basis. This will be decided by a consideration of the circumstances of the exposure, and the epidemiological likelihood of BBV in the source. In the vast majority of such exposures, it would be difficult to justify the use of HIV PEP. (UK Health Departments, 2004).

### Step Three: Risk Assessment – Determining Overall Risk

You now have a picture of the relative overall risk. Unfortunately there are no hard and fast guidelines but some situations - e.g. percutaneous needlestick with a cannula which had been placed in a HIV positive patient's vein - are clearly very high risk compared to others. Try to place the patient into either 'very high risk', 'moderate risk' or 'low risk'.

Discuss all patients with the ED consultant / Occupational Health unless clearly high risk requiring immediate treatment. In general most exposure is not of sufficient risk of HIV to warrant post-exposure prophylaxis (PEP). There is however a significant risk of hepatitis.

The clinician in charge of the source patient should consent the patient and obtain blood to test for blood borne virus using the consent form Annex B in the Trust Policy.

Occupational Health / ED if OOH, should obtain 4mls clotted blood sample to send to virology in RVH marked "recipient blood for storage"

High Risk <input type="checkbox"/>	Known HIV patient give PEP within one hour, and contact Occupational Health / ED.  <b>Specialist advice can be obtained from the Regional Genito-urinary Medicine Consultants for high-risk incidents, through switchboard at the Royal Victoria Hospital Belfast on 028 90240503.</b>
Moderate risk <input type="checkbox"/>	Some risk factors may have been identified e.g. lived or travelled in HIV endemic area – Urgent discussion with Occupational Health/ Emergency Medicine Consultant.
Low risk <input type="checkbox"/>	No risk factors identified – routine management

### Step Four: Treatment

#### 1. HIV prophylaxis

- Give recipient post-exposure prophylaxis starter pack, which is kept in the ED. *The recipient should take the first dose immediately*
- Obtain sample from recipient for baseline HIV analysis
- Refer to Occupational Health/GP

## 2. Hepatitis-B prophylaxis

HBV status of person exposed	Significant exposure			Non-significant exposure	
	HBsAg positive source	Unknown source	HBsAg negative source	Continued risk	No further risk
≤1 dose HB vaccine pre-exposure	Accelerated course of HB vaccine* HBIG x 1	Accelerated course of HB vaccine *	Initiate course of HB vaccine	Initiate course of HB vaccine	No HBV prophylaxis Reassure
≥2 doses HB vaccine pre-exposure (anti-HBs not known)	One dose of HB vaccine followed by second dose one month later	One dose of HB vaccine	Finish course of HB vaccine	Finish course of HB vaccine	No HBV prophylaxis Reassure
Known responder to HB vaccine (anti-HBs > 10 miU/ml)	Consider booster dose of HB vaccine	Consider booster dose of HB vaccine	Consider booster dose of HB vaccine	Consider booster dose of HB vaccine	No HBV prophylaxis Reassure
Known non-responder to HB vaccine (anti-HBs <10 miU/ml 2-4 months post-immunisation)	HBIG x 1 Consider booster dose of HB vaccine	HBIG x 1 Consider booster dose of HB vaccine	No HBIG Consider booster dose of HB vaccine	No HBIG Consider booster dose of HB vaccine	No prophylaxis. Reassure

### 3. For exposure to Hepatitis-C etc

- Obtain sample from recipient for baseline analysis
- Refer to Occupational Health/GP

## POST EXPOSURE PROPHYLAXIS AFTER SEXUAL EXPOSURE

You may be asked for PEPSE by a patient who is concerned about infection after risky sexual behaviour. It is important first to determine the risk of exposure to HIV/HEP B. The Trust has developed a policy along with the GUM department in Causeway Hospital for the assessment and management of these patients. Prescribe PEPSE as per this policy. All patients should be referred to GUM for follow-up.

## MAJOR TRAUMA TRIAGE PROTOCOL

### Trauma Team Call

**Bleep 6000 and ask for Adult / Paediatric / Obstetric Trauma Team if any of the following criteria are met.**

Trauma team consists of senior ED doctor/consultant, surgical SHO and reg, anaesthetic SHO and reg +/- paediatric team +/- Obstetric team

Physiology Factors	Anatomy Factors	Mechanism of Injury	Co-morbidity Factors
Adult: <ul style="list-style-type: none"> <li>• Systolic BP &lt; 90</li> <li>• RR &lt;10 or &gt; 29</li> <li>• GCS &lt; 13</li> </ul> Paediatric: <ul style="list-style-type: none"> <li>• Respiratory distress</li> <li>• Cap Refill &lt; 2</li> <li>• Tachy / Bradycardia</li> <li>• Inappropriate behaviour</li> </ul>	<ul style="list-style-type: none"> <li>• Penetrating injury</li> <li>• High energy blunt injury</li> <li>• Flail chest</li> <li>• Associated burns</li> <li>• ≥ 2 long bone #s</li> <li>• Unstable pelvis</li> <li>• Skull #</li> <li>• Associated paralysis</li> <li>• Crushed, degloved, mangles or amputated extremity</li> </ul>	<ul style="list-style-type: none"> <li>• Ejection from vehicle</li> <li>• Fall &gt; 6m (20ft)</li> <li>• Death of an occupant</li> <li>• Delayed extraction</li> <li>• Vehicle rollover</li> <li>• High speed crash</li> <li>• Large animal injury</li> <li>• Pedestrian / cyclist thrown or run over</li> </ul>	<ul style="list-style-type: none"> <li>• Pregnancy</li> <li>• Age &lt; 5 or &gt; 65</li> <li>• Anticoagulants</li> <li>• Bleeding disorder</li> <li>• IDDM</li> <li>• Immuno-compromised</li> <li>• Other significant organ impairment</li> </ul>

## MAJOR TRAUMA – ADULTS (SEE ALSO TRIAGE, ‘ABC’, BURNS, HEAD INJURY, FRACTURES

This term refers to patients who have been injured and who are either very ill *or who may become very ill later*. The patients are identified using the triage protocol in Section One.

Assess patients using recognised ATLS principles.

## MAJOR TRAUMA

### AMPLE history

Allergies  
 Medications  
 Past medical history  
 Last meal  
 Events leading

### Primary Survey

- A: Ensure patent airway, airway adjunct or intubate if necessary  
 Protect neck with 'stiffneck' collar, sandbags and tap on a trauma mattress
- B: Assess breathing – check for chest wall trauma, auscultate, sats RR  
 Apply 100% oxygen  
 Ventilate if inadequate respiration
- C: Assess circulation and cardiovascular status  
 Haemorrhage control  
 2 large bore IV access – send bloods for FBC / U+E / Cross match  
 Fluid resuscitation with 0.9% normal saline +/- O neg blood – permissive hypotension  
 Pelvic binder if potentially unstable fracture
- D: Mini-neurological assessment to include AVPU / GCS, pupils, posture, log roll (include PR exam if any spinal tenderness)
- E: Expose patient to identify obvious injuries, cover up to prevent heat loss
- Request imaging as indicated:
    - CT head and C-spine
    - CT chest / abdo / pelvis
    - Trauma series x-rays if no indication for CT – c-spine / chest / pelvis
  - Analgesia as required e.g. aliquots of morphine 5-10 mg IV +/- antiemetic

### Secondary Survey

Keep re-assessing 'ABC'

Do a secondary survey:   Head  
                                   Chest  
                                   Abdomen  
                                   Pelvis  
                                   Limbs  
                                   Reflexes

Do not delay unstable patients with uncontrolled haemorrhage from going to theatre for definitive or damage control surgical treatment

## BURNS (SEE ALSO MAJOR TRAUMA & TRIAGE)

*The patient deteriorates as the inflammation progresses*

*Discuss with Burns Unit if:*

- Potential airway burns (signs of smoke inhalation at nose or mouth)
  - >20% BSA involved (>15% in children)
  - Burns in difficult areas (hand, perineum)
  - Circumferential, deep or full thickness burns (check sensation & appearance)
- 
- Apply water gel (beware hypothermia) and give 100% oxygen
  - Give iv Morphine at once – large doses often required. In severe burns a morphine infusion may be required
  - ABC – remember that burned patients have often sustained other injuries. Shock in first few hours is not due to burns
  - You must ask for an early anaesthetic assessment if any suspicion of airway burns - they will get worse.
  - Think of inhaled poisoning – CO or cyanide\*. Measure COHb if consciousness is in any way impaired. If elevated COHb discuss hyperbaric oxygen with Craigavon Hospital
  - Have another look at burns- superficial or deep? Estimate % BSA using Lund and Browder Chart (below)
  - Give if >20% BSA give iv fluids to prevent the onset of burns shock –

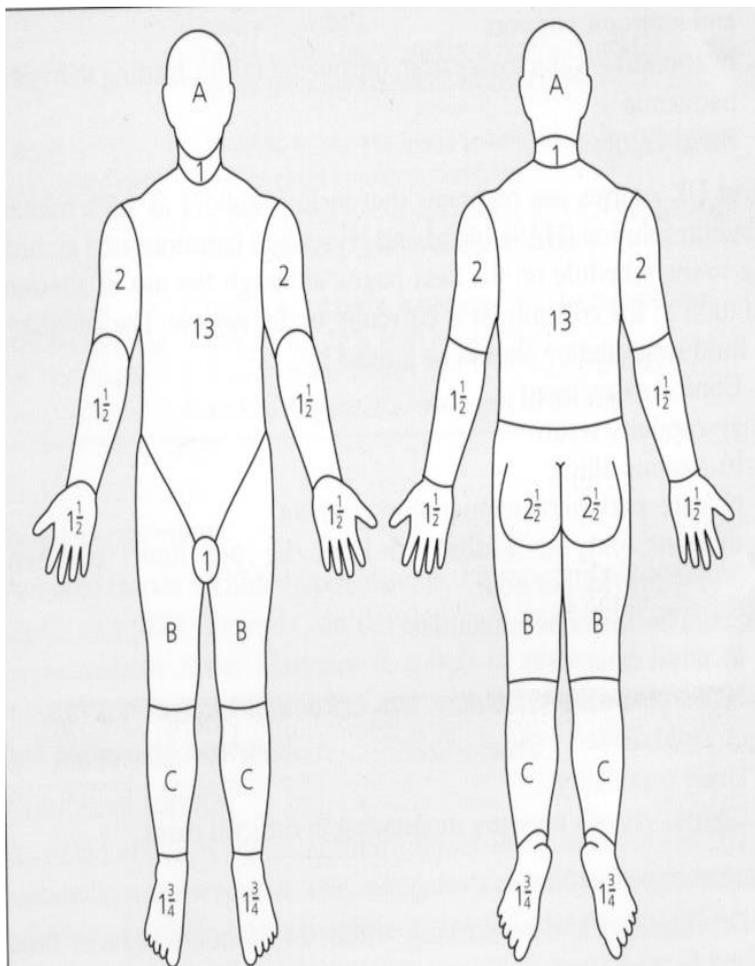
Volume in mls = wt(kg) x %BSA x ½ in first four hours from time of burn

- TREAT ALL VICTIMS OF FIRE IN UNEXPLAINED CARDIAC ARREST FOR CYANIDE POISONING ---THERE IS A CYANIDE TREATMENT PACK IN RESUS.

### Lund and Browder Chart

	Age in years					
	<1	1	5	10	15	Adult
A = ½ head (%)	9.5	8.5	6.5	5.5	4.25	3.5
B = ½ thigh (%)	2.75	3.25	4	4.25	4.5	4.75
C = ½ leg (%)	2.5	2.5	2.75	3	3.25	3.5

Classification of burn depth	
Classification	Features
First Degree (superficial, partial)	Limited to epithelial layer of the skin . Very painful and erythematous. Excluded from estimates of % burns Heals well
Second Degree (deep, partial)	Extends to dermis Painful Heals more slowly
Third Degree (full thickness)	Analgesic Full-thickness burn tissue is unable to stretch in response to underlying oedema, and circumferential full-thickness burns thereby exert a tourniquet effect that may compromise tissue perfusion and require urgent release or 'escharotomy'



## HEAD INJURY (SEE ALSO MAJOR TRAUMA)

This is a high-risk injury!

Follow the 2014 NICE guidelines given on the next two pages to help you manage head injuries.

As well as acutely injured patients, you will often see patients attending “minors” a few days after the event complaining of persistent headache etc.

*Late-presenting head injury symptoms and patients on Warfarin have a strong association with CT abnormality – discuss with a senior doctor.*

### **Safe discharge and Admission**

Do not send home patients with head injury if GCS less than 15

Do not send home patients with head injury if no one at home

Patients can be admitted to the Observation ward if GSC 15 or have a normal CT (performed as per the guidelines) and GCG 14 or 15

Patients should be admitted under the surgical team if GCS 13 or less, abnormal CT, polytrauma patient or no Observation beds available.

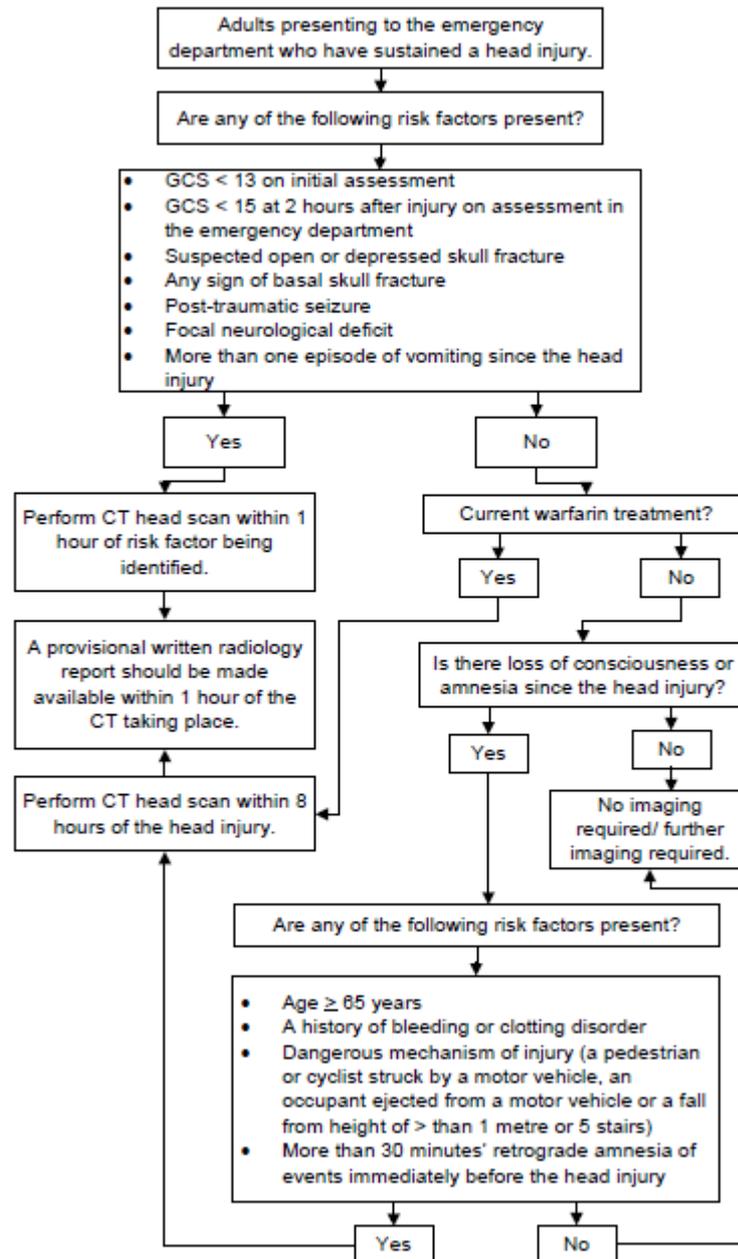
Written and verbal discharge advice should be given to all patients / relatives. These are found on Symphony.

### **Referral to Neurosurgical Team**

All patients with abnormalities on CT Head scan should be referred to the Neurosurgical SpR in RVH #6124. Remember to document in the notes the times and name(s) of the doctor(s) you discussed the case with. Clearly document any advice given, especially if the patient is likely to be admitted under another team.

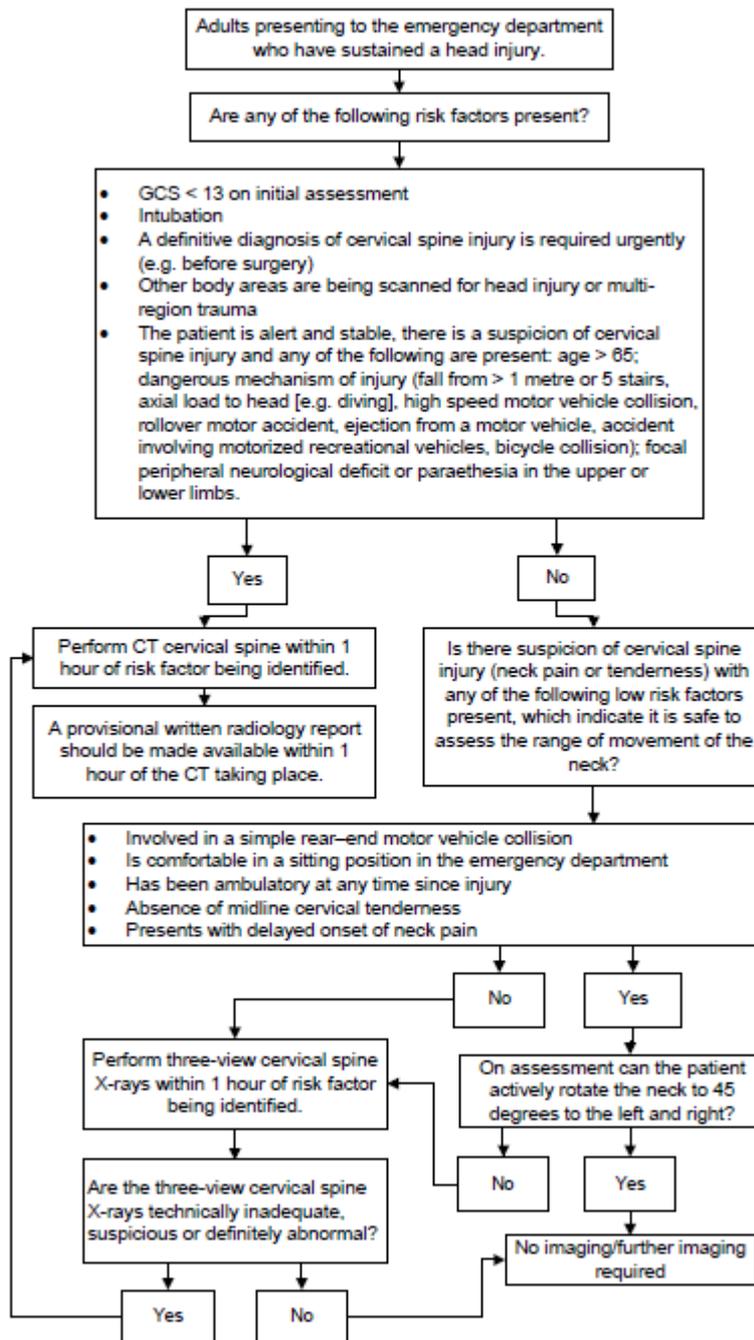
## Summary of 2014 NICE Head Injury Guidelines

**Algorithm 1: Selection of adults for CT head scan**



If patients are anti-coagulated (warfarin, NOAC) with a significant head injury, reversal should be given immediately and an urgent CT performed as above. NICE recommends CT head imaging within 8 hours for patients with head injury on anticoagulant and without indicators for urgent CT scan but regionally it has been recommended that these scans are performed within 1 hour and urgent consideration is given to reversal of the warfarin (or NOAC).

**Algorithm 3: Selection of adults for imaging of the cervical spine**



## CONCUSSION AND RETURN TO SPORT

Concussion is a common injury, especially in young people playing sports. Significant harm can be caused by a second head injury in a patient with concussion. This is taken very seriously in professional sports such as rugby but non-professionals are at risk too. The following is taken from the Observation Ward discharge advice for return to sport and should be explained to the patient should be followed.

- ☑ Prior to fully returning to sport/ strenuous activity, it is important that you follow the 'step-wise' system overleaf to allow you to return safely.
- ☑ It is likely that you may experience a number of symptoms as a result of your head injury (listed below). **These are different to the immediate return indications listed on the Head Injury Advice Sheet**
- ☑ It is vital that your symptoms have completely cleared at each level for a minimum of 24 hours before you progress to the next level.
- ☑ You should not return to any full sporting activity in less than 1 week.
- ☑ Where any unconsciousness or significant loss of memory after the injury (post traumatic amnesia) has occurred there should be no full contact activity (Level 5) within 3 weeks. In these circumstances a medical review by your GP or your professional medical advisor should be undertaken before any full contact activity.

### Possible Symptoms after a head injury

Mild headache	Poor concentration
Tiredness	Irritability
Dizziness	Memory problems
Sleep disturbance	

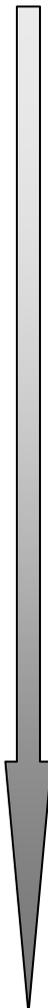
If symptoms develop at any exercise level then you should return to Level One (i.e. 24 hours rest).

Contact your GP if your symptoms are persistent and/or not improving  
On discharge

### Second Impact Syndrome

Second Impact Syndrome is a rare condition which occurs when a person with symptoms related to their recent head injury (concussion) suffers a second head injury. Second impact syndrome may occur days or weeks after the initial concussion. This second injury may be relatively minor but it can lead to collapse and death. For this reason we do not recommend full contact

in sports for at least three weeks and only after medical advice. It is also important to inform your doctor of your initial head injury.



<b>LEVEL 1</b>	No physical activity /complete rest
<b>LEVEL 2</b>	Low levels of physical activity i.e. <i>symptoms do not come back during or after the activity.</i> e.g. walking, light jogging, light stationary biking, light weightlifting (lower weight, higher reps, no bench, no squat).
<b>LEVEL 3</b>	<i>Sport specific training or Moderate levels of physical activity with body/head movement</i> e.g. running in football, moderate jogging, brief running, moderate-intensity stationary biking, moderate-intensity weightlifting (reduced time and/or reduced weight from your typical routine).
<b>LEVEL 4</b>	<i>Heavy non-contact physical activity / training drills</i> e.g. sprinting/running, high-intensity stationary biking, regular weightlifting, routine non-contact sport-specific drills
<b>LEVEL 5</b>	<i>Full contact in controlled training/practice.</i>
<b>LEVEL 6</b>	Full contact in games/ Return to competition.

Adapted from McCrory P, et al. Br J Sports Med 2013;47:250–258.

doi:10.1136/bjsports-2013-092313

## FRACTURES (SEE ANKLE AND FOOT, SHOULDER AND CLAVICLE, KNEE, NECK, WRIST, SEDATION, FALLS AND HAND INJURIES)

*This handbook cannot give an exhaustive account of fracture management, however guidelines about the management of common fractures can be found later in this section. As well as this, McRae provides easy-to-follow guidelines in the department's copy of "Practical Management of Fractures". Consult these first but ask for advice if in doubt.*

Here is some general information about fracture management:-

*Our Specialist Fracture Service is provided by RVH Fracture Clinic RBHSC Children's Fracture Clinic*

### **Adult Fractures**

- Patients who may require urgent operative treatment should be referred to the fracture clinic immediately; this includes all compound fractures (except finger tip injuries. These can be managed in the Emergency Department)
- Fractures that are badly displaced/angulated, intra-articular or comminuted should be discussed with RVH (excluding elderly patients with Colles fractures)
- All ankle fractures that are bi-malleolar, medial malleolar or associated with talar shift should be discussed with RVH
- Acute tense haemarthrosis should be discussed with the fracture clinic. Fractures around the tibial plateau (condyles) are easily missed – be vigilant; all should be referred
- All fractured neck of femurs should be referred to RVH for admission.
- All consults with the RVH should be recorded on the Emergency Department notes and fracture doctor's name recorded
- NSAIDs may inhibit fracture healing and should NOT be prescribed.
- All patients over 18 with lower limb fractures should undergo VTE assessment. There is a specific form for this assessment in Antrim and should be followed until the regional assessment form becomes available later this year.
- For all patients diagnosed with a fracture not requiring urgent intervention, tell patients that we have requested # clinic follow up but that the date will be dependent on the triage system in Whiteabbey Hospital.

### **Looking after Children's Fractures**

- Children's fractures are hard to see - when in doubt plaster!
- When children fall onto their outstretched hand while roller-blading, biking etc, they usually sustain a greenstick fracture distal radius at least. Use a Futuro Splint if you can't see a fracture. Check elbow!
- Refer torus (buckle fracture no displacement) fractures to the Fracture clinic.
- Children under three can remove short arm pops - use long arm pop with this age group. If slightly older children return with short arm plaster problems then place in a long arm pop.
- If you discharge a child with a diagnosis of soft tissue injury, tell parents to return the next day if their child still has significant pain - soft tissue injuries in children clear up very quickly.

- Significant displacement or angulation and all compound fractures should be discussed with RBHSC

### **Liaison with Plastic Surgery (UHD)**

Hand fractures that may require internal fixation are usually referred to Plastic Surgery. These include all unstable/rotated finger fractures. Assume this if oblique or spiral on x-ray, displaced on x-ray, malrotation or deformity clinically or complete inability to flex. Fractures involving more than one third of IPJ surface should be referred. Fractures of distal phalanx are managed at the Review Clinic.

### **Older patients**

- Elderly patients with fractures often require a care package via the social worker because of a short term increase in dependency (e.g. reduced mobility due to # vertebrae, pubic rami or loss of independence due to an upper limb fracture). Hospital admission shouldn't be required for nursing needs alone.
- Always look out for unexplained or recurrent falls – more about this under "Falls" in clinical section.

### **Query fractures, small avulsion fractures**

- If you aren't sure about these, treat with sling, backslab, non weight – bearing etc. Explain that there may be a "minor injury to the bone" but that the diagnosis will not be certain until a second x-ray is taken after ten days. Refer to the Emergency Department Review Clinic for this.
- Don't put a leg in plaster if the patient is over 45 or has other risk factors for DVT unless there is a definite fracture. Use strapping and crutches.
- The management of clinical scaphoid fractures is important (see wrist injuries).
- Look out for the 'fat pad sign' in the elbow as a pointer to radial head # (this is the most commonly missed fracture). Treat with collar + cuff and x-ray at ARC day 7-10. A clinically fractured elbow will not have a normal range of movement. Treat if in doubt.

### **Reductions in the Emergency Department**

- Only uncomplicated wrist fractures (such as Colles Fractures) should be reduced in the Emergency Department
- Analgesia / sedation options include:
  - Entonox
  - Haematoma block
  - Conscious sedation (assess suitability using sedation proforma, also use this to facilitate safe sedation practice – MUST have senior ED doctor signed off to perform sedation and separate procedure doctor)

- A post –reduction plaster should be A SPLIT FULL CAST (never unsplit POP).
- POP advice must be given - all patients re-attending with symptoms suggesting a tight plaster should have their cast opened immediately after triage.
- Need fracture clinic appointment within 1 week
- Failed reductions should be discussed with RVH
- Fracture reductions may be deferred until next day if no neurovascular compromise is found. Admit these patients to the Obs ward overnight for analgesia and fast from 6am.
- Reduction of dislocations must be performed in a timely fashion.

## **SOFT TISSUE INJURIES (SEE ALSO FRACTURES, NECK, ANKLE AND FOOT, SHOULDER AND CLAVICLE, KNEE, LOW BACK PAIN)**

It is often minor injuries that present doctors new to the Emergency Department with the most difficulty.

Soft tissue injuries are satisfying to treat – they often happen to active, healthy people, especially sportsmen and women who are highly motivated to recover.

- (dolor, rubor, tumour, calor) so the injury will look and feel progressively worse over the next 2-5 days. This process responds to rest – ice (15 mins with frozen peas qid!)-compression bandage – elevation and non-steroidal drugs help also.
- Regain NORMAL MOVEMENT. After the inflammatory phase, gradual return to normal movement is encouraged. Patients must return to normal activities as soon as possible or stiffness and wasting will deteriorate. Often this is just a matter of common sense but for more complicated injuries, physiotherapy may help. This phase may take several weeks.
- Return to SPORT. Sports people or manual labourers will need further rehabilitation to regain the muscle strength and proprioception that they will have lost during phases one and two of recovery. Failure to follow a rehabilitation programme at this stage will cause injury.
- Physios (either hospital or club) can supervise this. There is also information on the internet about self help for various sports and injuries.

Here are a few commonly encountered soft tissue injuries - all of them are suitable for referral to physiotherapy, especially if severe:

A “**contusion**” is a bruising injury to soft tissue generally caused by a direct blow (e.g. multiple contusions after an RTA). More extensive bleeding leads to a haematoma that may be localised, leading to a fluctuant swelling or diffuse, leading to an area of woody-hard muscular induration.

A “**sprain**” is a ligament injury, e.g. ankle sprain, acute neck sprain. The commonest sprains involve the lateral ligaments of the ankle and the medial collateral ligament of the knee.

Ligament Injuries are often classified according to severity

Grade One: Pain on stressing but no laxity (no significant tear)

Grade Two: Laxity with an end-point (partial tear)

Grade Three: Laxity with no end point (complete tear )

A “**strain**” is a muscle tear, either intrinsic e.g. an acute lumbar strain may be “intrinsic” (sudden stooping) or “extrinsic” (falling from a height). This can result in diffuse or discrete bleeding, loss of power or function, a palpable gap and spasm/pain.

Explain the natural history of soft tissue injury (above) and advise that symptoms may last for months although they should not get worse. Patients should return immediately if worse or after ten days if not improving at all – this suggests a missed fracture etc. The appropriate advice sheet should be given (a selection of these are available).

## NECK (SEE ALSO SOFT TISSUE INJURIES, FRACTURES)

### **Pain without injury:**

- Usually muscular (Wry Neck)  
NSAID, massage, heat, very urgent physiotherapy  
Consider ENT cause in kids
- Occasionally caused by Cervical disc prolapse  
Severe pain with nerve root pain +/- signs  
If neurology, discuss with on-call orthopaedics

### **Suspected Neck Injury**

- Patients who may have thoracic or lumbar injury should lie flat on a trolley  
(*never a long board - this is for transport & lifting only*)
- Cx spine x-ray unless no mechanism for spinal injury, full range of movement and no tenderness
- Acute Neck Sprain – tends to get worse over a few days - NSAID, mobilise, reassure

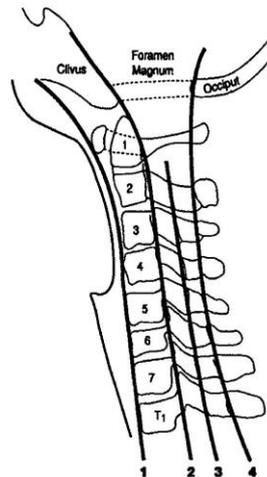
- Spinal Fractures-Patients who may have cervical spine injury should lie flat on a trolley with neck immobilised in cervical collar, sandbags and tape until x-ray and examination exclude this. The first (lateral) x-ray will require traction on the arms so that C7/T1 can be seen.  
Do not accept non-diagnostic x-rays – seek senior advice.
- When x-rays discuss spinal injury, seek advice

### Cervical spine x-rays

Cervical spine x-rays do not need to be ordered if all the following are met (NEXUS criteria):

- No posterior midline tenderness
- No evidence of intoxication
- Normal level of consciousness
- No focal neurological deficit
- No painful distracting injuries

If continuing concerns re. unstable neck injuries **Continue** spinal



Cervical spine review alignment  
The cord lies between 2 and 4

1. Anterior vertebral line.
2. Posterior vertebral line (anterior wall of the spinal canal).
3. Facet line.
4. Spino-laminar line (posterior wall of the spinal canal).

immobilisation & x-rays. Link with senior ED clinician. For further reading

<http://www.fphc.co.uk/>

**Penetrating Neck Wounds**

- All penetrating wounds require exploration in theatre
- Never probe, cover –Air embolism!!
- Think of impending airway obstruction. Anaesthetic assessment.

## FACIAL INJURIES

*The airway is a risk with major facial injuries – request anaesthetic assessment!*

### **Malar Fractures**

- Blow to the cheek
- Tender, limited upgaze, numbness.
- Facial X-rays will confirm diagnosis (sinus is cloudy compared to other side)

### **Maxillary fractures**

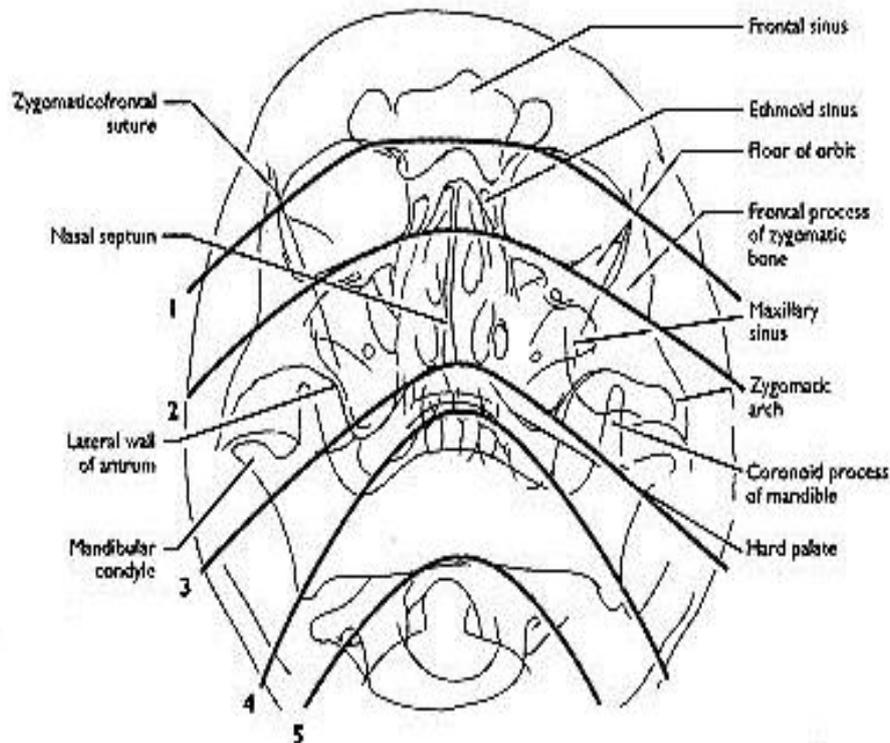
- Usually high energy impact
- Facial swelling
- Malocclusion
- Epistaxis
- Facial X-rays should be taken but may not help
- Facial bone instability may be found on examination

### **Mandibular Fractures**

- Assault or RTA
- Malocclusion
- Pain on clenching teeth
- OPG shows fracture (often bilateral) if you look carefully

### **Blow-out fracture**

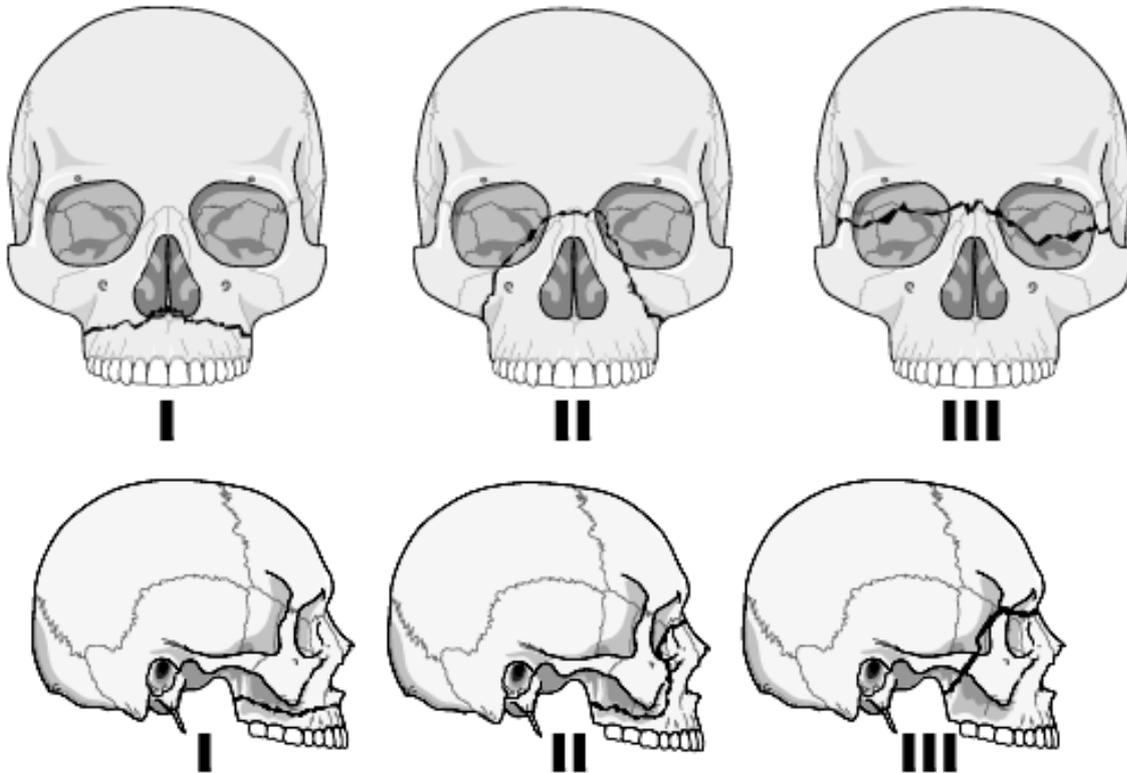
- Blow to eyeball
- Limited upgaze +/- diplopia
- Soft tissue (teardrop) visible on Facial x-ray



### ABCs of the Facial X-ray

- A: Adequacy  
Alignment - Check lines 1-5 (see above)
- B: Bones
- C: Cartilage and joints  
Zygomaticofrontal suture
- S: Sinuses - Opacification and air-fluid levels  
Soft tissue - Swelling and Foreign bodies

## Le Fort's Fractures of the Face



### Orbital Fracture



#### Indirect signs of maxillary fracture

- \* Soft tissue swelling
- \* Opacification of the maxillary sinus is usual in fractures which affect its wall and an air-fluid level is usually seen
- \* Soft tissue emphysema is a rare but useful sign. It provides positive evidence of a fracture of the nasal cavity or one of the paranasal sinuses. It may show as multiple small radiolucent areas in the soft tissues. Alternatively air may enter the orbit to outline the eyeball

All definite or suspected facial bone injuries should be discussed with the maxfax SHO in the Ulster hospital urgently (NOT the patient's own dentist)

## DENTAL EMERGENCIES (SEE ALSO FACIAL INJURY)

There is a very limited emergency dental service for patients. The details of this are kept in the Triage cubicle. Dentists are supposed to provide emergency cover for their patients but some of their answer-phones advise patients to attend Antrim Emergency Department! You must be able to provide basic emergency care. Advise patients with a non-traumatic dental problem to contact their own dentist to arrange follow-up.

### Dental pain

Give strong analgesia. Clove oil may be of benefit. Patients are advised to attend their dentist.

Out of hours relief of dental pain clinic **phone 25663500**. There is also a clinic in BCH.

### Dental Infection

Give strong analgesia and antibiotics (check BNF)  
NB LUDWIG'S ANGINA, AN INFECTION CAUSING SWELLING OF THE FLOOR OF THE MOUTH AND POTENTIAL SUDDEN-ONSET UPPER AIRWAY OBSTRUCTION – ADMIT – CONTACT ENT!

### Dental Haemorrhage

Patient should bite on a roll of gauze

Consider coagulopathy

Follow BNF guidelines for bleeding in warfarinised patients where relevant

Seek advice from Maxfax SHO in the Ulster Hospital

### Trauma

Dental trauma can be referred to RBHSC (under thirteens) or UHD (any).

Avulsed second teeth should be replaced in Triage prior to seeking dental advice. If this is impossible, keep tooth in N Saline.

## SHOULDER AND CLAVICLE

### Non-Traumatic Shoulder pain

*Septic arthritis must be excluded in all atraumatic joint pain – temp + ESR.*

“Frozen shoulder” is caused by a variety of pathologies all characterised by pain (especially at night) and restriction of movement at the shoulder joint. The two commonest causes are (a) Capsulitis, involving the rotator cuff muscles, characterised by equal restriction of abduction, internal & external rotation and (b) Supraspinatus tendonitis with pain on restricted abduction only.

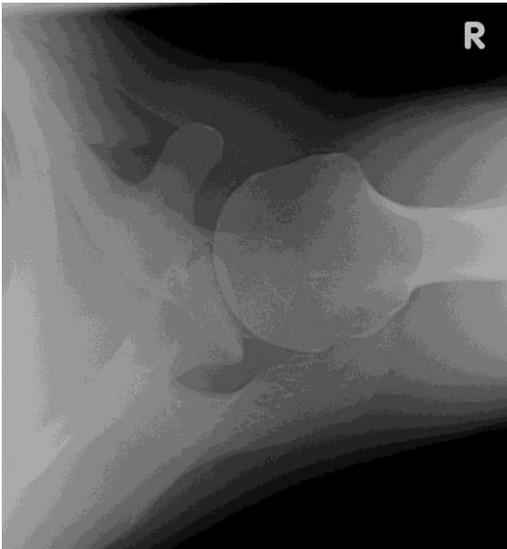
Use collar & cuff + NSAD and physio referral. Evidence for injection now inconclusive. Shoulder pain may be referred from the neck – examine as well.

## **Injury around the Shoulder**

### **Dislocated Shoulder**

Commonly anterior but can be posterior (x-ray looks fairly normal but light-bulb shaped humerus and clinical suspicion). Can occur as the result of seizure/collapse. Always ask for a glenoid view. Normal glenoid view is below.

Shoulder may be reduced under self-administered N<sub>2</sub>O from entonox bottle OR iv sedation (not both!). Consent must be obtained. Sedation must be performed in resus by senior doctor with airway and sedation competencies. Aftercare – inside-clothes collar & cuff or polysling and FC review.



**Consider Cunningham's technique which is rapidly being adopted by many ED consultants:**

<http://lifeinthefastlane.com/cunninghams-shoulder-relocation/>

### **Clavicle Fracture**

Inside-clothes sling or C+C, analgesia and fracture clinic 7-10 days.

Tell patient that they will have a permanent bump on their shoulder but that these are rarely troublesome.

Don't panic about marked deformity unless a spike of bone is tenting skin or there is a neurovascular problem (discuss the latter with RVHFC)

## WRIST INJURIES (SEE ALSO FRACTURES, SEDATION, SOFT TISSUE INJURIES, FALLS)

### Colles' Fracture

*Did you remember that Abraham Colles described dorsal angulation, impaction and rotation of the distal radius + ulnar styloid avulsion? Strictly speaking all distal radial fractures are not Colles' Fractures!*

Emergency Department treatment is only suitable for low-impact fractures without comminution or joint involvement –other distal radial fractures should be discussed with RVH FC.  $>15^{\circ}$  angulation and/or impaction of the distal radius usually requires reduction. You will be taught how to assess, reduce and discharge patients with this injury – do not undertake this procedure unsupervised unless a consultant has told you that you are competent to do this procedure unsupervised.

### Haematoma Block

This procedure can be used to manipulate closed Colles'-type fractures in over 45yo

This procedure should not be performed by a solitary doctor; a qualified nurse or plaster technician must be present and a second doctor rapidly available.

#### **Method**

1. The fracture must be a less than 24 hours old, no signs of infection.
2. Patient should be monitored (in case of inadvertent IV injection of lignocaine).
3. Prepare the patient, explain the procedure, and obtain consent.  $<1\%$  (1 in 1000) chance of osteomyelitis
4. The forearm should be prepped with iodine. The operator must wear surgeon's sterile gloves.
5. Prepare 10ml 2% lignocaine in a 10ml syringe and green (21G) needle.
6. The anaesthetic should be injected directly into the fracture haematoma: Locate the fracture site by palpation. You should feel the needle coming into contact with the jagged bone ends as it passes between them to a depth of 3-4cm. Aspirate some of the haematoma from the fracture site (but be aware that it is not possible to be certain that you are not in a vein rather than the haematoma!).. IF done under bright light, the fat globules will be visible streaming up centre of syringe barrel. Barbotage increases efficacy.
  - a. Inject- $\frac{1}{2}$ volume
  - b. Aspirate-fully
  - c. Repeat-(upto7times).

This ensures good mixing across all sides of # & does not make the bone edges less distinct during manipulation.

Cont ...

7. **Inject VERY SLOWLY to minimise the risk of complication.** The wrist will become tight. Put a sterile dressing (e.g. mepore) over puncture site(s)

8. Wait for block to take effect - on average 5-10 minutes. Check analgesia before proceeding to manipulate. Supplement with "Entonox" if necessary but if patient complains of persistent pain, get senior help; do not proceed with manipulation.

9. The patient can be mobilised after their check x-ray if they feel ready to get up.

### **Smith's Fracture**

"Upside-down Colles". If you don't view all your lateral wrist x-rays thumb-down you will miss this! Discuss with RVHFC –should be immobilised in split LAPOP post reduction but this should only be undertaken by experienced doctors.

### **Scaphoid Injury**

Clinical: All painful wrists following trauma with any scaphoid signs must have wrist and 'scaphoid views'. You must always examine for scaphoid injury in all the following ways:

- ASB tenderness or swelling
- Pain on telescoping and impinging thumb vs 1<sup>st</sup> MC
- Pain on flexion + ulnar deviation
- Pain over palmar scaphoid

Management: 1. Clinical Scaphoid (i.e. signs but no x-ray changes).  
If there is strong suspicion (more than 1 sign) –SAPOP and bring back to nurse practitioner day 14.  
If there is mild-moderate suspicion (1 sign) – Thumb-oprene splint and bring back to nurse practitioner day 14.  
2. Radiological scaphoid fracture.  
If you see a fracture SAPOP and FC – they are usually six-eight weeks in plaster.

### **Other Fractures**

- Undisplaced wrist fractures and greensticks = POP, sling and FC
- Other wrist fractures should be discussed with RVHFC.

## **HAND INJURIES AND INFECTIONS (SEE ALSO FRACTURES)**

All hands should be examined for tendon function, sensation (pin-prick) and joint swelling. Record **occupation and dominant hand**. Uniquely, hand

injuries should be x-rayed even if fracture unlikely - if only one finger involved ask for finger XR rather than hand. Most significant hand injuries benefit from elevation in a volar slab and high sling for a few days (i.e. until the next Review Clinic).

Flexor tendon injuries, significant amputation or degloving, nerve damage, high-pressure injection injuries and suppurative tenosynovitis or multiple hand fractures should be referred to the Plastics Registrar (Ring UHD).

### **Mallet Finger**

Where the ability to extend the distal phalanx is lost. X-ray and if there is a fracture involving more than one third of the joint surface refer to Plastics. Otherwise treat with a well-fitting “mallet splint” and next ARC appointment. The patient must not remove the splint. Six weeks’ treatment is usually required

### **Finger Sprains and volar plate injuries**

These generally affect PIP joints - any swelling here, treat as sprain. If hyper-extension (“staving”) injury treat as VPI.

Improper immobilisation leads to a chronic spindle-finger and a disgruntled patient. All with swelling should have x-ray then neighbour strapping and next ARC. NSAIDs may help.

### **Extensor tendon injuries**

These may be referred to the General Surgeons or Plastic surgeons for repair.

### **Flexor tendon injuries**

Don't forget to test both FDS and FDP - check flexion at DIPJ for profundus and flexion with uninjured fingers hyperextended for superficialis. Refer to Plastic Surgery in UDH

### **Hand Infections**

- acute paronychia - incise around the cuticle and nail-fold in the shape of the nail until pus expressed.
- Pulp (finger tip) abscesses should be drained by twirling a sharp-pointed scalpel round on them.
- suppurative tenosynovitis is a very serious condition which usually follows a trivial or forgotten finger prick. The finger is swollen, stiff and very painful - especially when bent back. –REFER TO PLASTICS
- Deep palmar infection – systemic upset, redness and swelling, pain when fingers are straightened – REFER TO PLASTICS

## **Finger tip injuries (FTI)**

These tend to look worse than they are. Providing no bone is exposed they can be dressed, immobilised and reviewed at next Emergency Department Clinic.

Leave children's nails in situ. Adults' nails should generally be removed if injured but this can be done next day if you are not sure what to do. Antibiotics are often indicated. If bone is exposed and you are unfamiliar with management, contact surgical SHO. Finger terminalisation is not an ED procedure.

- **Amputation.** Providing no bone is exposed the finger can be dressed with "mepitel", immobilised and reviewed at the next Emergency Department clinic. If bone is visible refer to plastics. Refer to plastics also if amputated part is available to assess possibility of re-implantation (usually not feasible).
- **Partial amputation (Adults).** This presents as a crush, a laceration or an avulsion of the nail. Primary repair of nail bed required if significant laceration. Refer to plastics if bone visible. Follow-up in ED if no bone visible – dress with mepitel and immobilise
- **Partial amputation (Child).** Primary repair is rarely necessary – you should consult a senior doctor or the plastics SHO if there is a deep nail bed laceration. Other cases treated conservatively (as described above).
- Antibiotics (Co-amoxiclav) are indicated if there is a compound fracture or if you suspect that the bone is exposed.

Patients/parents will be particularly anxious about fingertip injuries. You must explain the prognosis and management plan very carefully to them. Advice is usually along the lines given below:

- FTIs are generally not as bad as they look and, although slow to heal, the final result is usually much better than they expect.
- In the case of complete amputation, the finger will be treated conservatively at first but, if it does not respond, amputation of a small section of their finger may be required subsequently.
- In the case of Partial amputation (Adults), you can discuss the options of nail removal and meticulous nail bed repair versus conservative treatment which will almost certainly result in permanent deformity of the nail. Many patients prefer to risk the latter!
- If you are dealing with partial amputation in a child you must explain that conservative management is usually as successful as primary repair but

that dressings must be looked after carefully and that very occasionally the fingertip will eventually be lost because of the nature of the injury.

FTIs generate a lot of complaints so if a patient/parent expresses concern about your management plan you should discuss the case with an Emergency Department consultant or plastic surgeon.

## **KNEES (SEE ALSO LIMPING CHILD, FRACTURES, SOFT TISSUE INJURIES)**

### **1. Trauma**

#### **Red Flags – refer to RVHFC**

- Fractured Tibial Plateau
- Displaced fracture patella
- Acute Haemarthrosis
- Penetrating injury
- True locking
- Dislocated Knee (not patella!)

#### **Key Points in History**

- Mechanism is important: Direct blow (muscles and bones), stretch (ligaments) and/or twist (cartilage)?
- True locking or giving way are the key symptoms of loose body or cartilage tear
- Rapid swelling = haemarthrosis; gradual swelling = effusion
- Dislocations may relocate spontaneously so history may be the only remaining clue – patient may recognise description of patella or knee joint dislocation

#### **Rapid Examination**

- Look and feel for swelling, inflammation or wounds
- Palpate along the joint line for specific areas of tenderness (menisci)
- Test movement, especially extension – can the patient lift their knee off the bed (ie test extensor mechanism) ?
- Stress the ligaments (mainly ACL and MCL) for any sign of a tear (see Soft Tissue Injury)

#### **Management**

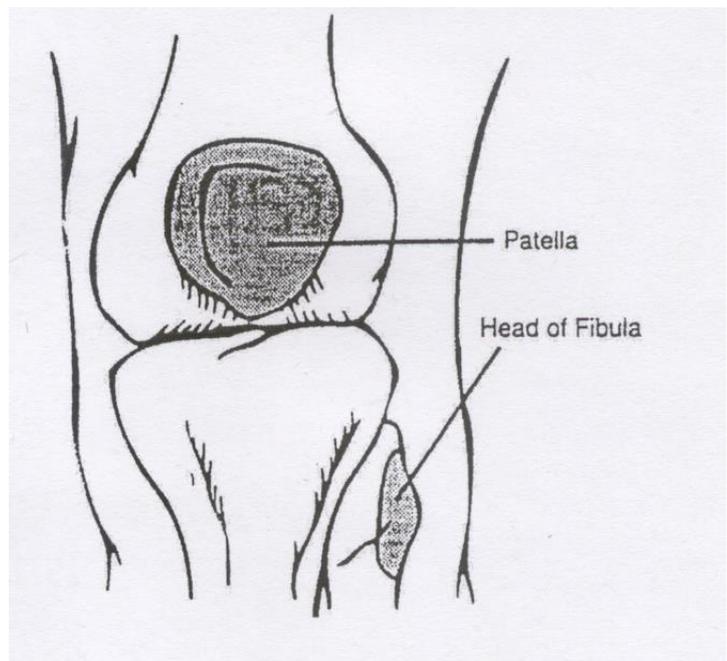
- Significant haemarthrosis should be discussed with RVHFC
- Suspected rupture of extensor mechanism; x-ray patella and discuss with RVHFC

- Dislocated patella can be reduced immediately with entonox and immobilised in POP cylinder. Refer to Fracture Clinic
- Dislocated knee must be reduced immediately – entonox and morphine if not able to quickly and safely sedate. Even if reduced pre-hospital, urgent vascular assessment is indicated - discuss with RVHFC
- Suspected cartilage or ligament tear without haemarthrosis; Torn ligament cannot be excluded in the acutely painful knee because ligaments cannot be adequately stressed. Explain this to the patient. NWB crutches and urgent physio. Ask GP to consider urgent orthopaedic referral if patient does not respond.
- All suspected penetrating trauma should be referred to RVHFC
- Fractures around the knee are rare but commonest after RTA. They can involve tibial plateau, patella, neck of fibula – discuss with RVHFC

### **Ottawa Knee Rules**

A knee X-ray series is only required for knee injury patients with *any* of these findings:

1. Age 55 or older
2. Isolated tenderness of the patella (that is, no bone tenderness of the knee other than the patella).
3. Tenderness at the head of the fibula.
4. Inability to flex to 90 degrees.
5. Inability to bear weight both immediately and in the emergency department (4 steps; unable to transfer weight twice onto each lower limb regardless of limping).



### **2. Non-traumatic knee pain**

KNEE X-RAYS ARE NOT INDICATED FOR ATRAUMATIC KNEE JOINT PAIN BUT REMEMBER THAT HIP PAIN MAY BE REFERRED TO THE KNEE.

### Pre-patellar Bursitis

Learn to distinguish *bursitis*, which is obviously red and well demarcated, from a *joint effusion* which is more diffuse and associated with greater reduction in movement. *Bursitis* can be inflammatory or infective (less common) and can be treated expectantly with anti-inflammatories +/- antibiotics unless severe. Severe or non-responding bursitis may require I&D – discuss with senior ED doctor.

### Knee joint effusions

The following knee effusions require immediate aspiration to exclude septic arthritis:

- All recently injected/aspirated joints
- All warm, tender joints with effusion
- All effusions if WCC or ESR raised
- Suspicion of TB
- All effusions in immuno-compromised patients (ADMIT)

A hot joint may be due to septic arthritis, Reiter's disease, unexpected haemarthrosis or crystal arthropathy but you have to assume sepsis if the aspirate is cloudy-looking until negative cultures obtained. If the joint aspirate is straw-coloured, treat with NSAIDs and rest. Patient must be reviewed by GP. Blood usually follows forgotten minor trauma in a patient with degenerative disease and can be treated in the same way. Turbid joint fluid requires admission/discussion with a Rheumatologist.

### Anterior knee pain

Causes include chondromalacia patellae (quads wasting), recurrent lateral dislocation of patella (apprehension test), patellar tendonitis (localized to tendon), Osgood Schlatter's ("sporty kids" + swelling and tenderness over tibial tubercle), Osteochondritis Dissecans (locking joint – do an x-ray!).

Rest, NSAID, Physio opinion, back to GP!

### Locked Knee

- Inability to extend knee beyond a certain point.
- Pseudo-locking (esp. children and young adults) responds to iv Pethidine followed by slow and gentle sustained pushing downwards into full extension.
- True Locking (usually older patient or known loose body / meniscus tear) does not usually respond to iv pethidine. *Must be discussed with RVHFC urgently.*

## ANKLE AND FOOT (SEE ALSO FRACTURES, SOFT TISSUE INJURIES)

### 1. Ankle Injuries

History:

- Snap, crack or pop? – suggests significant bone or ligament injury

Examination:

- Deformed or dislocated? Give entonox/IV morphine and pull straight at once or get help at once, then apply backslab POP – x-ray comes afterwards!
- Compound fracture? –Iodine, gauze and tape, iv Co-Amoxiclav, describe wound to fracture unit (Wound >1cm? contused, dirty or neurovascular complications?)
- Other cases- Ottawa ankle rules to decide if x-ray is needed (usually not needed). Next page.

First Aid

- Ice in a glove for ten minutes + analgesia

Management of sprains and fractures

- All fractures (except \*) - SL backslab POP and discuss with RVH urgently
- If extremely swollen, can't weight bear at all or small avulsion-type fracture\*(<0.5cm) use dynacast splint and review at ARC/CRC
- Vast majority – RICE advice (see soft tissue injuries) and DTG. Mobilise and self care for up to six weeks unless problems. Decision flow chart:

Is imaging appropriate?

If NO bony injury:

Grades of ankle sprain			
Sign/symptom	Grade I	Grade II	Grade III
Ligament tear	None	Partial	Complete
Loss of functional ability	Minimal	Some	Great
Pain	Minimal	Moderate	Severe
Swelling	Minimal	Moderate	Severe
Ecchymosis	Usually not	Common	Yes
Difficulty bearing weight	None	Usual	Almost always

**GRADE I**

- Analgesia
- PRICE advice
- Double Tubigrip
- NSAIDS x 72 h if no contra-indications
- Patient advice leaflet

**GRADE II**

- As per Grade I PLUS:
- Crutches?
- Need for physio?
- Recurrent? Need for orthopaedic review?

**GRADE III**

- Analgesia
- PRICE advice
- NSAIDS x 72 h if no contra-indications
- Patient advice leaflet
- Crutches
- Supervised physiotherapy
- Need for cast/ Aircast brace?
- R/W 10 days

**2. Foot Injuries****Fractures**

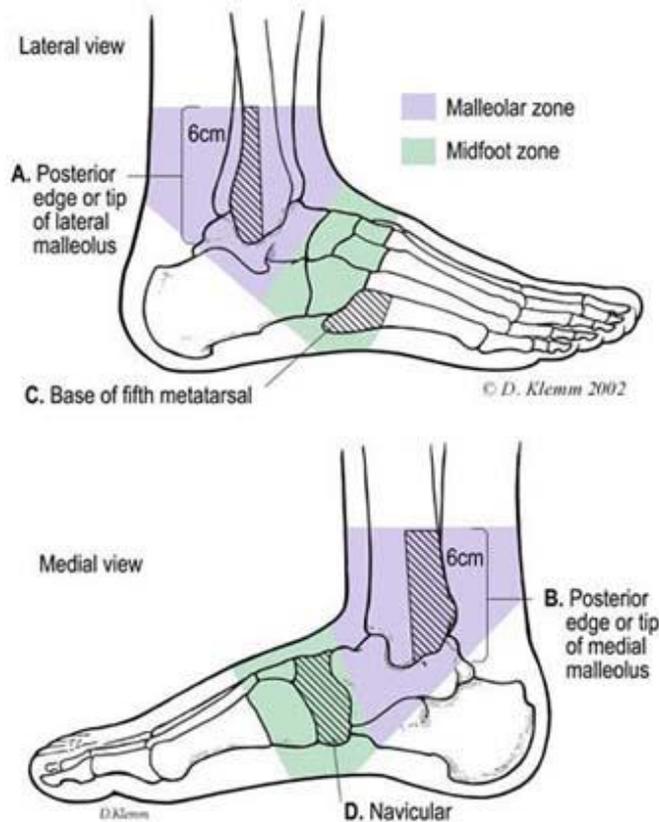
- Avulsion fracture 5<sup>th</sup> MT base and isolated metatarsal fractures – Strapping and crutches if minor or POP if major. Refer to FC. Transverse (non-avulsion) fractures of 5<sup>th</sup> MT are an exception – discuss with RVHFC.
- Other foot fractures or abnormal separation of metatarsals – discuss with RVH FC
- Calcaneal fractures are serious and very easily missed- always look at the calcaneus on the x-ray and examine it clinically. There may be no fracture line, just a flattened appearance. Os calcis x-rays are indicated if suspicion.

**Non –traumatic foot pain***This is a high risk symptom*

- *Septic arthritis must always be excluded – temp and ESR*
- Careful vascular assessment of whole leg (+capillary refill time)

- Focal bone tenderness + raised ESR – consider osteomyelitis
  - Non-specific cases – Footwear advice, NSAID, crutches, GP review
- Foot pain without evidence of serious underlying cause usually responds to a change of footwear

## Ottawa Ankle and Foot Rules



Ankle X-ray required if:

1. Pain in malleolar zone and
2. Bony tenderness at A or B
3. or an inability to weight bear immediately

Foot X-ray required if:

1. Pain in mid-foot zone and
2. Bony tenderness at C or D
3. or an inability to weight bear immediately

## WOUNDS (SEE HAND INJURIES, IMMUNISATION, SUSPECTED EXPOSURE TO BBV)

### General Facts about Wound Care

- Tetanus +/- hepatitis, anti-bacterial prophylaxis should be considered
- Profuse bleeding can be controlled by a direct pressure dressing – consider underlying arterial damage even if pressure has arrested haemorrhage. Seek senior advice if necessary. Bleeding scalp wounds usually respond to skin suture and a temporary pressure dressing.
- Wounds must be thoroughly cleaned and explored (tourniquet if necessary)
- Where primary closure is planned, lacerations that are not right through dermis and less than 1cm long may be suitable for steri-strips or tissue adhesive glue. Larger or deeper wounds require suture or staples. Steri-strips or tissue adhesives should not be used across joints or Langer's lines
- Lacerations crossing the vermilion border of the lip must be sutured meticulously –seek senior advice

### Wound Breakdown

- Infection, ischaemia and foreign body prevent wound healing – if these are likely, suturing may not be the best option or delayed primary suture may be considered. Seek senior advice.
- All wounds caused by glass (including by mirrors) must be x-rayed (FB)
- Pre-tibial wounds should not be sutured (ischaemia)
- Seek senior advice before suturing flap lacerations (ischaemia)
- Grossly contaminated wounds and most bites should not be sutured –seek advice (infection)

**Some common wounds / injuries and treatments are shown below.**

Condition	Site	Treatment	Healing Time
Laceration	Face	Glue - superficial, <3 cm, straight, tension free)	5 days
		Steristrips - straight, tension free	
	Scalp	Sutures - 6'0, non-absorbable	3-5days
		Glue - superficial, <3 cm, straight, tension free	
Over joints	Sutures - 3'0 non-absorbable	7 days	
	Staples	7 days	
Hands	Sutures - 3'0 and 4'0	10-14 days	
	Sutures – 4'0 and 5'0	10 days	

	Trunk	Sutures – 3'0 or staples	10 days
	Limbs	Sutures – 3'0 or staples	10 days
Sprains	Ankle	DTG for 2-3 days Dynacast / elastoplast strapping for 2-3 days	6-8 weeks 2-3 mths
	Knee	Grade 1 tear - DTG / Arthropad (2-3 days) Grade 2 tear - DTG / Arthropad (consider physio) Grade 3 tear - cast/ knee brace & d/w RVH	6-8 weeks
	Wrist	DTG for 4-6 weeks Futuro splint for 2 weeks then DTG	6-8 weeks
Volar Plate Injuries	Fingers	Dorsal Blocking Splints/Neighbour strapping for 3 weeks	6 weeks
Mallet finger	Fingers	Mallet splint, review clinic	6 weeks
UCL Sprains		Thumb spica. Review clinic(2 weeks) If opening, to plastics ASAP	2-4 weeks
Tenosynovitis		Futuro/ SAPOP (2 wks) +/- NSAIDS	2-6 weeks

## FALLS (SEE ALSO FITS, FAINTS AND FUNNY TURNS)

*It is negligent to ignore unexplained or recurrent falls!*

One third of elderly patients who present to the Emergency Department after a fall have an underlying cause for it (usually gait disturbance, visual impairment or cardiovascular disorder including drug effects). All patients aged 65+ who have fallen should be screened for *unexplained or recurrent falls* by taking a careful history of the event. NICE Falls: assessment and prevention of falls in older people 2013 gives further advice.

Patients with unexplained or recurrent falls who are fit for discharge must have:

- CVS and CNS examination
- a sight test(fields and acuity)
- a gait assessment (in hours this is carried out by physio, other times doctor & nurse. Don't forget Parkinson's disease!)
- an ECG, + BP erect and supine, interpreted in conjunction with their full medication list.

They can be followed up in community by the GP or community rehab team.

## HIP FRACTURES

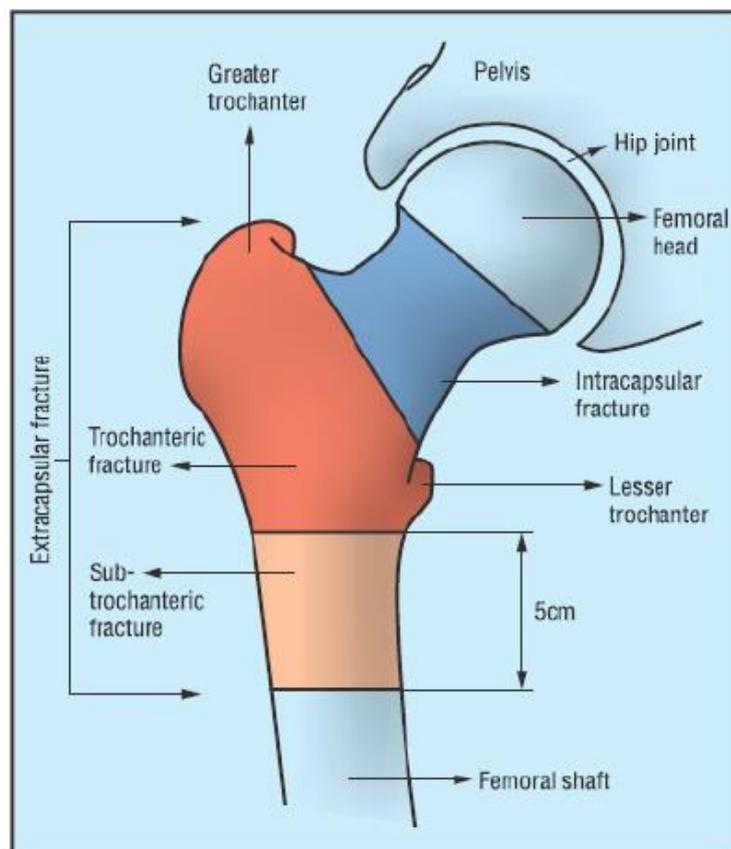
Patients with possible hip fractures are usually managed through minors. They need timely assessment to provide adequate pain relief as soon as they arrive in hospital – consider morphine 5-10mg IV given in aliquots. Reassess pain 30 mins after administration of initial analgesia.

Femoral nerve block is a useful adjunct to pain relief but should only be performed if competent.

Typically there is a history of fall with a shortened, rotated e.g. Check neurovascular status of limb. Do not forget to assess why the patient fell – this often includes ECG, FBC / U+E and other investigations as clinically indicated.

Once diagnosed, liaise with orthopaedic SHO in RVH to arrange transfer of the patient to RVH. Antrim Hospital does not have fracture beds and patients should not be boarded in Antrim awaiting a fracture bed. Treat and stabilise any life threatening medical conditions prior to transfer.

Figure 1: Types of hip fracture (Parker M & Johansen A, 2006)<sup>259,270</sup>



Classification of hip fractures. Fractures in the blue area are intracapsular and those in the red and orange areas are extracapsular

## DOMESTIC VIOLENCE

- *Abuse can be experienced by*
  - *Children*
  - *Spouses / partners*
  - *The elderly and vulnerable adults (elder abuse)*

You need to have a high index of suspicion to identify this. Patients require privacy for this kind of conversation and sometimes a member of the nursing staff may be more appropriate to explore this possibility with the patient.

“Suspicious Seven” of domestic violence -

- all women with injuries due to assault arriving by ambulance after midnight
- all women with the combination of defensive arm injury with scalp/facial injuries
- all women presenting with a more than two hour delay from the time of injury particularly those presenting more than 24 hours after loss of consciousness
- all women with a history of a “fall” downstairs and injuries above the waist
- all pregnant women with abdominal injuries
- all women injured by weapons
- all women with multiple attendances due to trauma

We can help women by offering to contact the police, careful documentation of their injuries so that they can contact a solicitor regarding a civil action and/or giving them our written literature about the Domestic Helpline. Ensure that someone discusses a “crisis plan” with the patient, giving advice about how they should prepare in advance for a sudden departure with their children.

## OSTEOPOROSIS

Low impact fractures are those associated with minor trauma. In post-menopausal women such fractures occur in the wrist, spine and neck of femur. Please also consider pathological fractures. Remember if the bone is tender following a fall, you must x-ray the painful bone. Not all fractures show on x-ray, therefore clinical suspicion must be low for a fracture. Once treated please advise them to attend their GP for further advice re osteoporosis. After diagnosis of the first osteoporotic vertebral fracture, x-rays are not indicated to diagnose further osteoporotic fractures in the appropriate clinical context.

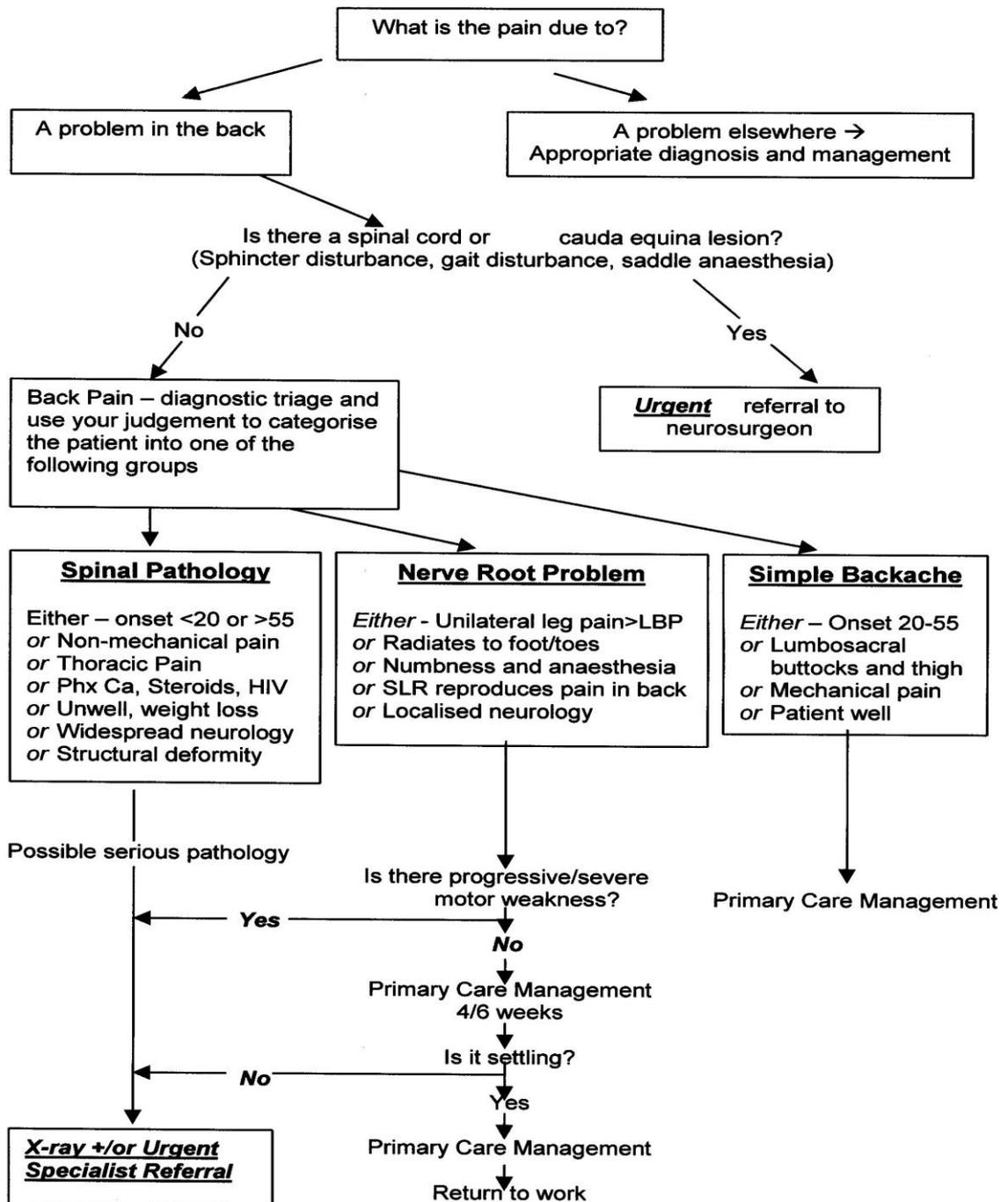
## LOWER BACK PAIN

Current national guidelines for the management of lower back pain are given on the next page. Get into the habit of using this diagnostic triage system as it will greatly improve your own efficiency and satisfaction in dealing with these patients.

You must be familiar with the criteria for urgent referral to a neurosurgeon.

The primary care management of simple backache is the responsibility of the patient and their GP. Note that patients should be advised to rest in bed for no more than two days after which they should gently mobilise, ideally with the assistance of a physiotherapist. Stress that medical research has shown that patients who resume normal activities (e.g. work, hobbies, sport) get better more quickly than others. Patients should be asked to attend their GP for follow-up. Patients should never be admitted to Antrim Hospital for the treatment of low back pain. GPs will frequently refer patients with intractable back pain to the Emergency Department, not because of “red flags” but because of intolerable pressure from patients and relatives. Be patient in this situation – the whole family are often at their wits’end. Take a full history and listen to the carer as well as the patient. Ascertain what social support is available. Perform a meticulous examination. Medical management decisions should be made according to the diagnostic triage protocol. *If no red flags exist you cannot arrange emergency admission to hospital.* Explain this to the patient and warn them about red flag symptoms such as bladder upset or weakness. Tell patient that their GP is the only person who can refer them to the Orthopaedic service urgently and that you will contact the GP to advise this. Maximise analgesia and social support. If they remain very dissatisfied, speak to a senior Emergency Department doctor.

**DEPARTMENT OF A&E MEDICINE  
DIAGNOSTIC TRIAGE OF A PATIENT PRESENTING WITH LOW BACK PAIN**



## CAUDA EQUINA SYNDROME (CES)

*Remember that patients with CES may have no leg signs*

This is a very difficult diagnosis.

2 categories

1. CESI- an incomplete lesion

Impairment of bladder/saddle sensation and difficulty with micturition, but the patient remains continent

2. CESR- a complete lesion

The patient has painless urinary retention with dribbling overflow incontinence

At the outset the patient will be constipated through loss of the parasympathetic innervation to the descending colon, even although anal tone is lax. Faecal incontinence is a very late sign.

The patient in pain who is having difficulty with voiding purely for mechanical reasons is aware that the bladder is full, retains the desire to micturate, has normal sensation in the saddle region, and a tender bladder.

In contrast, the patient developing CES will develop some or all of the following:

- Altered saddle and/or urinary sensation
- Perineal/rectal pain
- Reduced awareness of bladder filling
- The need to strain to maintain urine flow

It is important that the diagnosis is considered, ask appropriate questions and record them and finally give good advice about the development of such symptoms and to seek urgent medical attention.

Such cases should be discussed with the appropriate middle grade or on-call consultant.

## PROBLEMS IN EARLY PREGNANCY AND GYNAE EMERGENCIES (SEE MORNING AFTER PILL)

*The Emergency Department is not a suitable venue for Gynae assessment unless emergency admission may be required. GPs have been advised that patients who do not require admission should not be referred to the Emergency Department for a “Gynae opinion”. General practitioners can access the Consultant of the week via a DECT phone for urgent advice. Patients being sent to ED to “shortcut waiting times” should be discharged back to their General Practitioner unless clinically unstable or becoming symptomatically anaemic*

Patients commonly self refer or come with GP letter because of bleeding in early pregnancy. GPs also have direct access to the on call O+G team for gynae review in the assessment area. If they have heavy bleeding, are shocked or have passed products of conception the gynae SHO must be contacted and you should commence basic treatment in the resuscitation area until help arrives.

### IN AN EMERGENCY FULL O&G TEAM CAN BE CALLED BLEEP 6000.

(Consider in pregnant patient in trauma or life threatening emergency / cardiac arrest in pregnant patient.

Triage nurses may be able to directly access the EPAC service or O&G team depending on the presenting complaint using a new gynae referral pathway. For conditions not suitable for this pathway the patient will wait to be seen by the ED team.

- Take Gynae (including sexual, pregnancy and contraceptive) history
- Ask about amount of blood loss, passage of clots or products of conception (“tissue”) and abdominal cramps
- Check urine HCG –if negative, send Serum HCG (but remember that serum HCG may not be elevated in very early pregnancy). *Ectopic pregnancy is exceptionally unlikely if serum HCG is negative.* The most likely diagnosis with amenorrhoea, PV bleeding and negative HCG is “normal” late period, dysfunctional bleeding, completed abortion. Perimenopausal women may have a similar presentation and occasionally a false positive urine HCG; speak to the gynae SHO if in doubt.
- If a patient with PV bleeding or a history of abdominal or pelvic trauma is HCG positive, rhesus status should be checked in case anti-D is required
- Examine abdomen for tenderness, guarding, rebound
- Check vital signs and general appearance for evidence of shock

The potential loss of a pregnancy, including ectopic pregnancy, is usually an extremely distressing experience, although you should not assume that you know how an individual patient feels. Great sensitivity is required in handling patients and with threatened or completed miscarriage and their partners (it is often a good idea to ask one of the senior female nursing staff to spend some time alone with the patient). Most patients without evidence of heavy bleeding, pain, abdominal signs or shock can be given qualified reassurance, advised to rest and booked into the next EPC.

### **Potential indications for admission to Obs & Gynae**

1. Positive urine or serum HCG AND any of the following
  - a. Heavy PV bleeding and/or products of conception passed
  - b. PV bleeding with abdominal cramps
  - c. PV bleeding with shock
  - d. PV bleeding in mid-trimester
2. Post Partum or post-op/post-laparoscopic complications
3. Severe PID, non-responding to GP treatment
4. Very heavy vaginal bleeding
5. Vaginal foreign body that cannot be removed in ED
6. Suspected torsion, bleeding or rupture of ovarian cyst (acute abdomen)
7. Suspected placental abruption, labour, prom or pre-eclampsia
8. Hyperemesis gravidarum with ketonuria

## **ECTOPIC PREGNANCY**

Consider ectopic pregnancy in any woman of child bearing age with abdominal pain, shoulder tip pain, PV bleeding or syncopal episode / dizziness – always check urine hCG.

In patients with haemodynamic compromise resuscitate with 0.9% normal saline, obtain 2 large bore cannula, cross match, fast bleep gynae SHO **bleep 6000** to resus.

In patients with positive hCG, abdominal pain but no haemodynamic compromise, refer to the on call gynae SHO bleep 5666 for assessment, ideally on the ward and not in the ED as we have no scanning facilities.

**Patients with ? ectopic should not be discharged home without gynae review.**

## ANTI – D RHESUS IMMUNOGLOBULIN

Development of anti-D antibodies usually occurs as a result of foetomaternal haemorrhage in a rhesus negative woman with a rhesus positive foetus.

For successful immunoprophylaxis, anti-D Ig should be given as soon as possible after potentially sensitizing event but always within 72 hours. There is some protection if given within 10 days so it should be administered even if a delay in presentation. Do not give if already sensitised to RhD.

Give IM into deltoid (unless bleeding disorder: then give SC).  
 250 iu before 20 weeks gestation  
 500 iu from 20 weeks gestation

Potentially sensitising events:

- Spontaneous or threatened miscarriage at or after 12 weeks gestation
- Therapeutic termination of pregnancy
- Antepartum haemorrhage
- Any abdominal trauma
- Foetal death

## EARLY PREGNANCY ASSESSMENT CLINIC

Stable patients up to 20 weeks gestation can be referred to EPAC. Often directly from triage. This facility is midwife lead and to be used for those patients with a positive hCG and PV loss (less than normal menstruation) or after minor abdominal trauma.

At 5 ½ weeks it may be possible to see the foetal sac but heart beat may not be detectable yet.

By 6-7 weeks the foetus is clearly seen on transvaginal USS and heart beat can be detected.

By 8 weeks foetus and heart beat should be visible on transabdominal scan.

Scanning before 5 ½ weeks is unlikely to yield useful clinical data and this should be considered before referring patient to EPAC. A conservative wait and see approach with repeat hCG in 7 – 10 days may be considered.

**Phone EPAC 336520** in hours

**Phone ward C1 334198** out of hours for next day appointment

**Criteria for EPAC:**

- Women **must** have had a positive pregnancy test
- Must not be less than 6 weeks gestation or more than 20 weeks gestation

**And**

- Presenting with mild PV bleed and/or abdominal pain
- History of previous ectopic pregnancy
- History of previous Molar pregnancy
- History of previous Tubal pregnancy
- History of 2 or more miscarriages
- Complications of pregnancy requiring ambulatory care

**Unsuitable for EPAC:**

- Women presenting with profuse vaginal bleeding or acute severe abdominal pain.
- Women who are haemodynamically unstable
- Women with strong clinical suspicion of having an underlying ectopic pregnancy
- Women presenting with Pain and Bleeding with a negative pregnancy test
- Women with complications of pregnancy who require IP admission

## **POST COITAL CONTRACEPTION ('MORNING AFTER PILL')**

Post-coital contraception must only be prescribed within 72 hours of unprotected sex. Later cases must be referred to the GP to discuss IUCD.

Patients requesting PCC should be advised to attend the GP/OOH for a prescription or to attend a pharmacy where they can buy the medication after assessment by a pharmacist. Advise the patient also to attend the GUM clinic or GP for investigation of STIs.

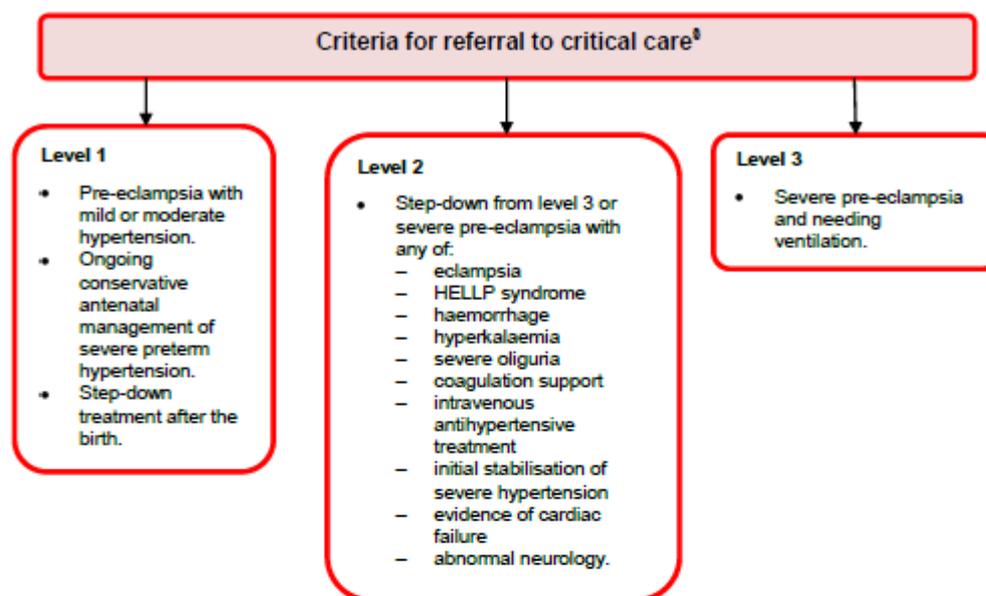
## PRE-ECLAMPSIA AND ECLAMPSIA

Check BP and urine for proteinuria in all pregnant women, especially if present with headache

Admit all patients with BP  $\geq$  140/90 and proteinuria via the Gynae SHO **Bleep 5666**

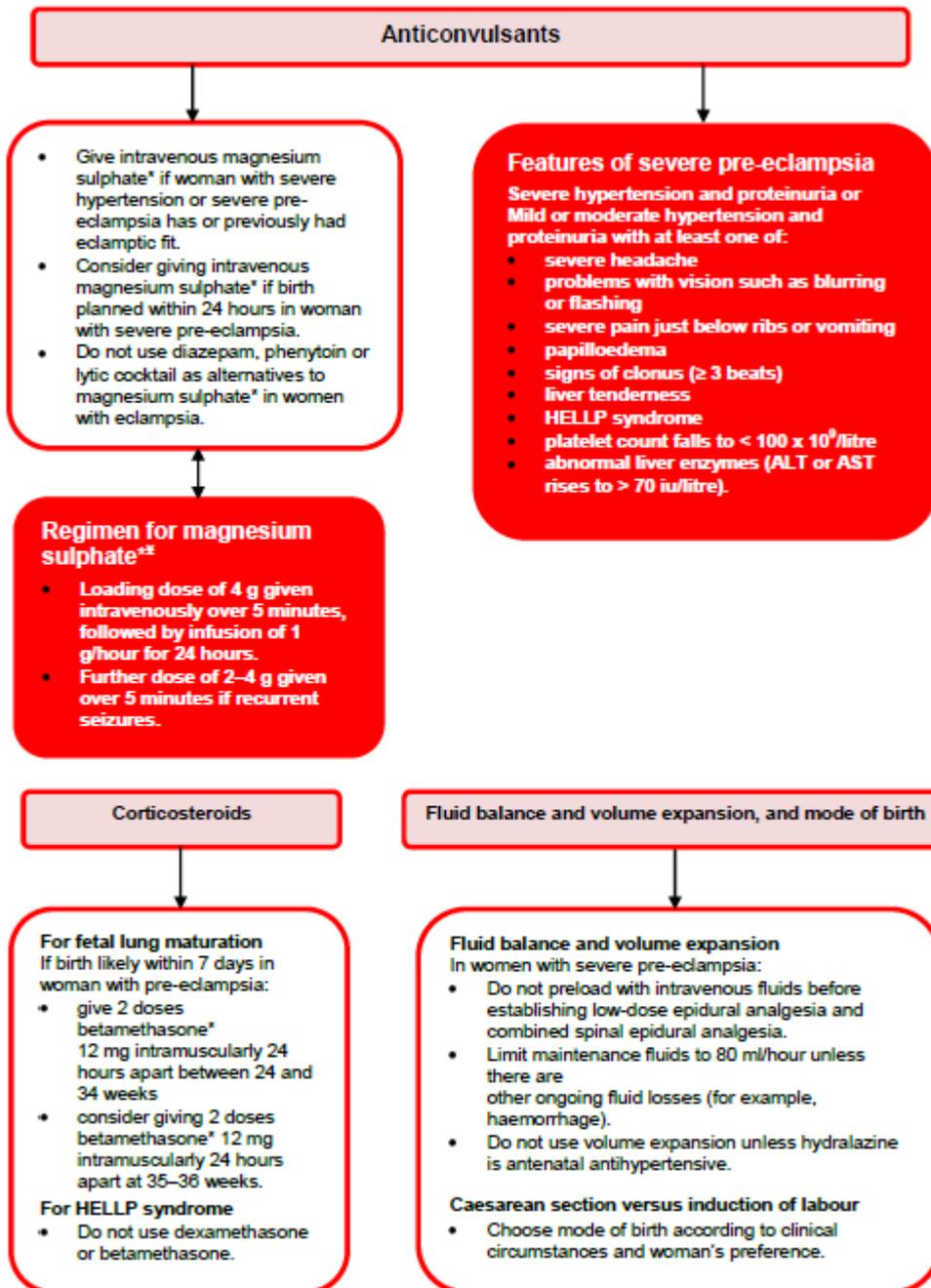
Refer all patients with BP  $\geq$  140/90 to gynae SHO for assessment

Severe hypertension, severe pre-eclampsia  
and eclampsia in critical care



### Management of severe hypertension

- Measure BP continually.
- Continue antenatal hypertensive treatment.
- If BP controlled within target ranges, do not routinely limit duration of second stage of labour.
- If BP does not respond to initial treatment, advise operative birth.
- Treat women admitted to critical care during pregnancy or after birth immediately with one of:
  - labetalol<sup>†</sup> (oral or intravenous)
  - hydralazine (intravenous)
  - nifedipine<sup>†</sup> (oral).
- Monitor response to treatment to:
  - ensure blood pressure falls
  - identify adverse effects for woman and fetus
  - modify treatment according to response.
- Consider using  $\leq$  500 ml crystalloid fluid before or at same time as first dose of hydralazine in antenatal period.
- Aim to keep BP < 150/80–100 mmHg.



## PAIN RELIEF FOR ADULTS

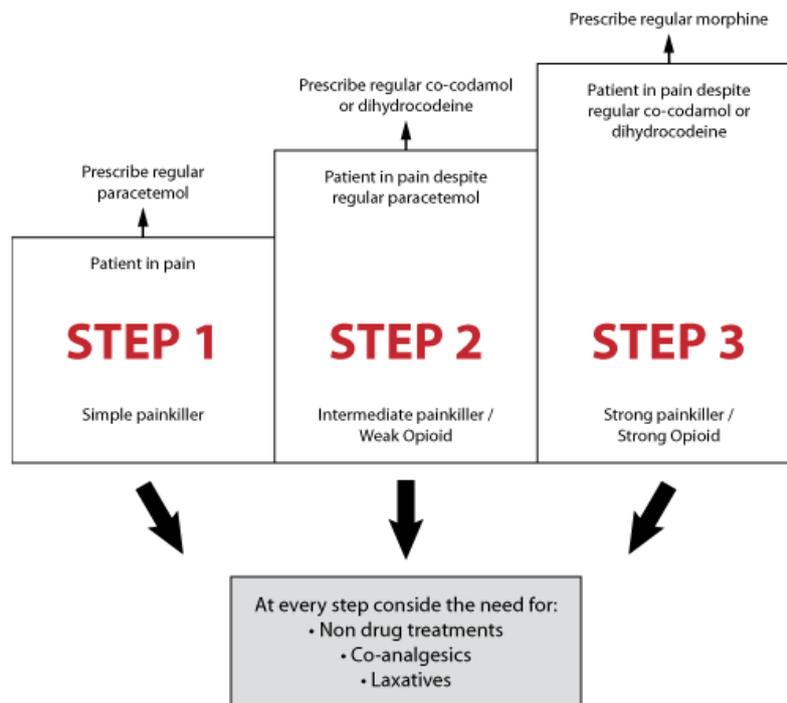
Pain scoring can help assess the need for analgesia and the patient's response. In general:

Mild:	3
Moderate:	6
Severe:	9

Reassess pain score 30 minutes after initial analgesia to ensure effective pain relief achieved in all patients with moderate and severe pain.

## PAIN RELIEF PRESCRIBING

The World Health Organization (WHO) has produced an analgesic ladder to be used as a guide for prescribing analgesics. Analgesics are staggered according to pain severity: mild, moderate and severe pain. If a patient does not experience pain relief on one step of the analgesic ladder, they should progress to the next step.



- Mild pain: Step 1: Simple analgesics (non-opioid)
  - Initiate topical and/or simple oral non-opioid analgesics (e.g. paracetamol, NSAIDs)
  - ± Adjuvant e.g. tricyclic antidepressants, anticonvulsants (pregabalin or gabapentin) for neuropathic pain.
- Moderate pain: Step 2: Weak opioid

- Weak opioid (e.g. tramadol, codeine phosphate or dextropropoxyphene)
- ± adjuvant e.g. tricyclic antidepressants, anticonvulsants
- Severe pain: Step 3: Strong opioid
  - Opioids (e.g. morphine, oxycodone)
  - ± adjuvant e.g. tricyclics, anticonvulsants

### **Alternative Methods of Pain Relief**

Distraction techniques

Immobilisation of injured limb e.g. splinting, sling, POP

Local Anaesthetic e.g. ametop, local infiltration of wound

Nerve block e.g. femoral nerve block, digital nerve block, haematoma block.

## **PROCEDURAL INTRAVENOUS SEDATION**

- *All doctors wishing to perform procedural sedation must be signed off by an ED consultant first. The list will be kept in the sedation folder.*

### **Indications**

Manipulation of simple fractures

Reduction of dislocations

### **Sedation Proforma**

Use the ED Sedation Proforma to assess a patient's suitability for sedation and to help formulate a sedation plan.

Key points:

- One signed off doctor to perform sedation
- One competent procedure doctor / nurse practitioner (cannot be the same as person as sedation doctor!)
- Nurse to monitor patient throughout and after procedural sedation
- The aim is *conscious sedation* not general anaesthesia
- Need to maintain safety in the rest of the department – it is unlikely that there would be enough doctors out of to achieve this, *contact the ED consultant on-call* (may be appropriate to admit to Obs Ward for procedural sedation the following day)
- If procedure successful admit to the Obs Ward to recover and arrange necessary follow-up.
- If procedure unsuccessful, refer to appropriate inpatient team / fractures. It is usually inappropriate to attempt to repeat the procedure unless there are clear and amenable reasons for initial failure. Always discuss this with the ED consultant.

# Paediatric



# Pages

## ABCDE – HOW TO RECOGNISE AND TREAT THE SERIOUSLY ILL CHILD

	Possible Problems	Management Options
<b>A</b>	<p>Airway obstruction</p> <ul style="list-style-type: none"> <li>• Partial or complete</li> <li>• Foreign body</li> <li>• Secretions/blood/vomit</li> <li>• Infection</li> <li>• Swelling e.g. anaphylaxis</li> <li>• trauma</li> </ul> <p>Loss of airway reflexes due to decreased LOC</p>	<p><b>OXYGEN</b></p> <p><b>Airway positioning</b></p> <ul style="list-style-type: none"> <li>• Neutral position in infant</li> <li>• Sniffing position in children</li> </ul> <p><b>Clearance of secretions / FB</b> e.g. suctioning</p> <p><b>Airway adjuncts</b></p> <ul style="list-style-type: none"> <li>• oropharyngeal, nasopharyngeal, Advanced airway e.g. intubation</li> </ul> <p>In awake child, let them adopt their own position of comfort</p>
<b>B</b>	<p>Respiratory failure</p> <ul style="list-style-type: none"> <li>• Inadequate oxygenation</li> <li>• Inadequate ventilation</li> </ul> <p>Look for increased work of breathing, signs of respiratory failure (decreased LOC, hypotonia, cyanosis, bradycardia)</p>	<p><b>OXYGEN</b></p> <p>Treatment of underlying condition e.g. infection, asthma, pneumothorax</p> <p>Manual ventilation if poor effort e.g. BVM</p>
<b>C</b>	<p>Shock</p> <ul style="list-style-type: none"> <li>• Hypovolaemia e.g. haemorrhage</li> <li>• Distributive e.g. sepsis</li> <li>• Cardiogenic e.g. myocarditis</li> <li>• Obstructive e.g. tension PTX</li> <li>• Dissociative e.g. CO poisoning</li> </ul> <p>Remember ↓BP is a late sign</p>	<p><b>OXYGEN</b></p> <p><b>IV/IO access</b></p> <p><b>Fluid bolus of 0.9% NS</b></p> <ul style="list-style-type: none"> <li>• 10mls/kg in trauma / DKA</li> <li>• 20mls/kg in other medical conditions</li> </ul>
<b>D</b>	<p>Decreased LOC</p> <ul style="list-style-type: none"> <li>• check AVPU</li> <li>• check pupils for size + reactivity</li> <li>• posture</li> </ul> <p>Localising signs e.g. complex seizure, meningitis</p>	<p><b>OXYGEN</b></p> <p><b>CHECK BM</b></p> <p>Protect airway and breathing</p> <p>Consider recovery position</p> <p>Treat underlying condition</p> <p>Consider CT Brain</p>
<b>E</b>	<p>Assess for other signs of illness e.g. rash</p> <p>Assess for other signs of injury e.g. long bone fractures</p>	<p><b>KEEP WARM</b></p> <p>Preserve dignity</p>

Notes:

1. Get senior EM doctor and paediatric team early
2. Children are more likely to have a primary respiratory arrest than a primary cardiac arrest. The cause is often **HYPOXIA – GIVE OXYGEN**

**Contacting Paediatric team in an emergency**

1. Fast bleep 6000 and ask for **PAEDIATRIC TEAM** if urgent help needed
2. Bleep 6666 and ask for **PAEDIATRIC ARREST TEAM** if cardiac arrest

**TRAFFIC LIGHT SYSTEM**

The Traffic light system should be used to assess serious illness (NICE).

**Table 1 Traffic light system for identifying likelihood of serious illness**

	Green – low risk	Amber – intermediate risk	Red – high risk
Colour	<ul style="list-style-type: none"> <li>• Normal colour of skin, lips and tongue</li> </ul>	<ul style="list-style-type: none"> <li>• Pallor reported by parent/carer</li> </ul>	<ul style="list-style-type: none"> <li>• Pale/mottled/ashen/blue</li> </ul>
Activity	<ul style="list-style-type: none"> <li>• Responds normally to social cues</li> <li>• Content/smiles</li> <li>• Stays awake or awakens quickly</li> <li>• Strong normal cry/ not crying</li> </ul>	<ul style="list-style-type: none"> <li>• Not responding normally to social cues</li> <li>• Wakes only with prolonged stimulation</li> <li>• Decreased activity</li> <li>• No smile</li> </ul>	<ul style="list-style-type: none"> <li>• No response to social cues</li> <li>• Appears ill to a healthcare professional</li> <li>• Unable to rouse or if roused does not stay awake</li> <li>• Weak, high-pitched or continuous cry</li> </ul>
Respiratory		<ul style="list-style-type: none"> <li>• Nasal flaring</li> <li>• Tachypnoea:                             <ul style="list-style-type: none"> <li>– RR &gt; 50 breaths/minute age 6–12 months</li> <li>– RR &gt; 40 breaths/minute age &gt; 12 months</li> </ul> </li> <li>• Oxygen saturation ≤ 95% in air</li> <li>• Crackles</li> </ul>	<ul style="list-style-type: none"> <li>• Grunting</li> <li>• Tachypnoea:                             <ul style="list-style-type: none"> <li>– RR &gt; 60 breaths/minute</li> </ul> </li> <li>• Moderate or severe chest indrawing</li> </ul>
Hydration	<ul style="list-style-type: none"> <li>• Normal skin and eyes</li> <li>• Moist mucous membranes</li> </ul>	<ul style="list-style-type: none"> <li>• Dry mucous membrane</li> <li>• Poor feeding in infants</li> <li>• CRT ≥ 3 seconds</li> <li>• Reduced urine output</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced skin turgor</li> </ul>
Other	<ul style="list-style-type: none"> <li>• None of the amber or red symptoms or signs</li> </ul>	<ul style="list-style-type: none"> <li>• Fever for ≥ 5 days</li> <li>• Swelling of a limb or joint</li> <li>• Non-weight bearing/ not using an extremity</li> <li>• A new lump &gt; 2 cm</li> </ul>	<ul style="list-style-type: none"> <li>• Age 0–3 months, temperature ≥ 38°C</li> <li>• Age 3–6 months, temperature ≥ 39°C</li> <li>• Non-blanching rash</li> <li>• Bulging fontanelle</li> <li>• Neck stiffness</li> <li>• Status epilepticus</li> <li>• Focal neurological signs</li> <li>• Focal seizures</li> <li>• Bile-stained vomiting</li> </ul>

CRT: capillary refill time  
RR: respiratory rate

## SUMMARY OF BASIC LIFE SUPPORT

	Infant (<1 year)	Child (1 year to puberty)
<b>Airway</b>		
Head-tilt position	Neutral	Sniffing
<b>Breathing</b>		
Initial slow breaths	Five	Five
<b>Circulation</b>		
Pulse check	Brachial or femoral	Carotid
Landmark	Lower half of sternum	Lower half of sternum
Technique	Two fingers or two thumbs	One or two hands
CPR ratio	15:2	15:2



Figure 4.3 Head tilt and chin lift in infants



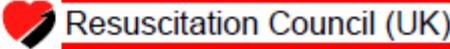
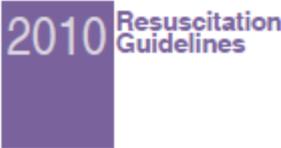
Figure 4.4 Head tilt and chin lift in children



### Vital Signs: Normal Ranges

Age (years)	Respiratory rate (breaths/min)	Systolic BP (mmHg) 5th centile	Systolic BP (mmHg) 50th centile	Pulse (beats/min)
<1	30–40	65–75	80–90	110–160
1–2	25–35	70–75	85–95	100–150
2–5	25–30	70–80	85–100	95–140
5–12	20–25	80–90	90–110	80–120
>12	15–20	90–105	100–120	60–100

# PAEDIATRIC LIFE SUPPORT: CHOKING CHILD



## Paediatric Choking Treatment Algorithm

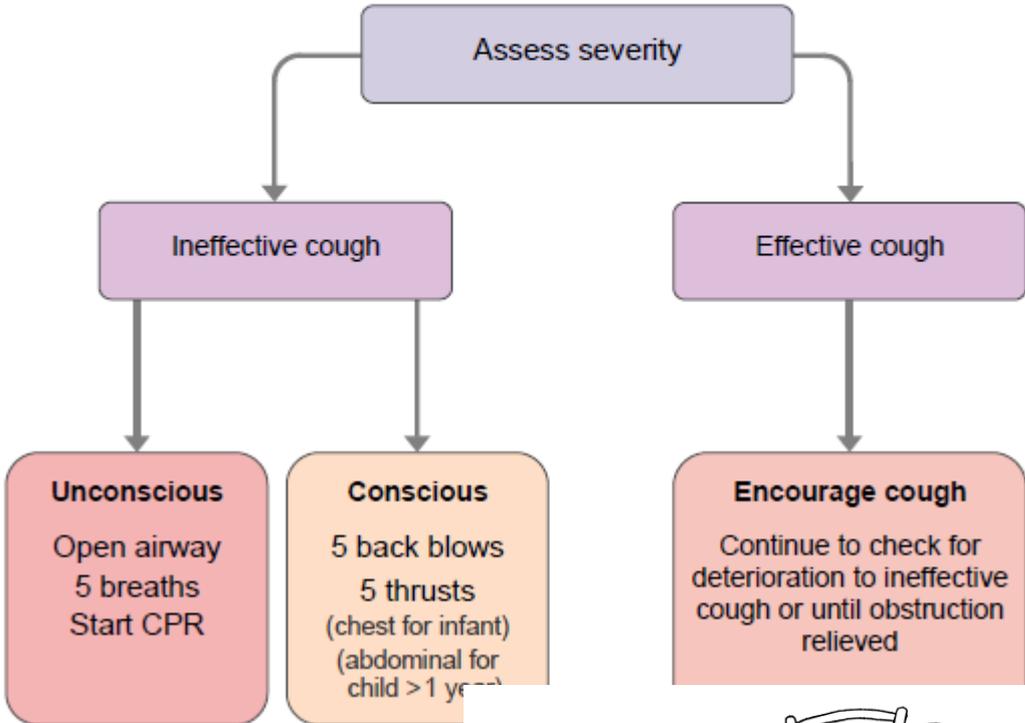


Figure 4.13 Back blows in an infant

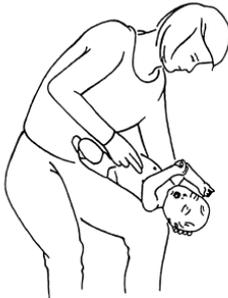


Figure 4.14 Chest thrusts in an infant



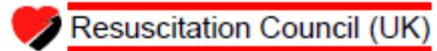
Figure 4.15 Back blows in a small child



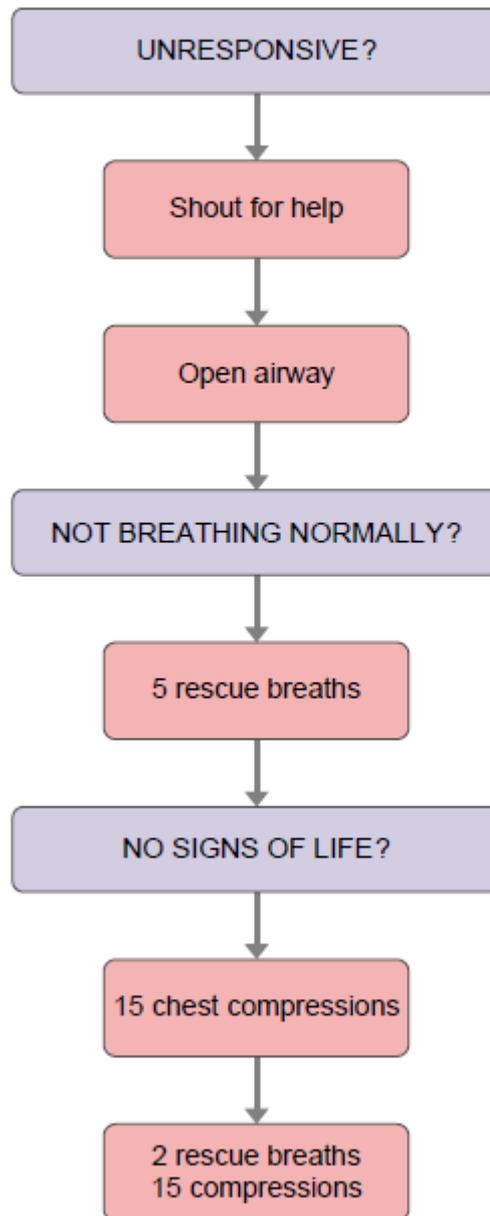
Figure 4.16 Heimlich manoeuvre in a standing child

# PAEDIATRIC BASIC LIFE SUPPORT

2010 Resuscitation Guidelines

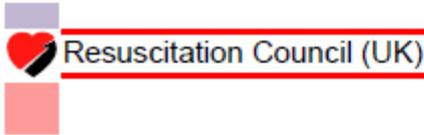


**Paediatric Basic Life Support**  
(Healthcare professionals with a duty to respond)

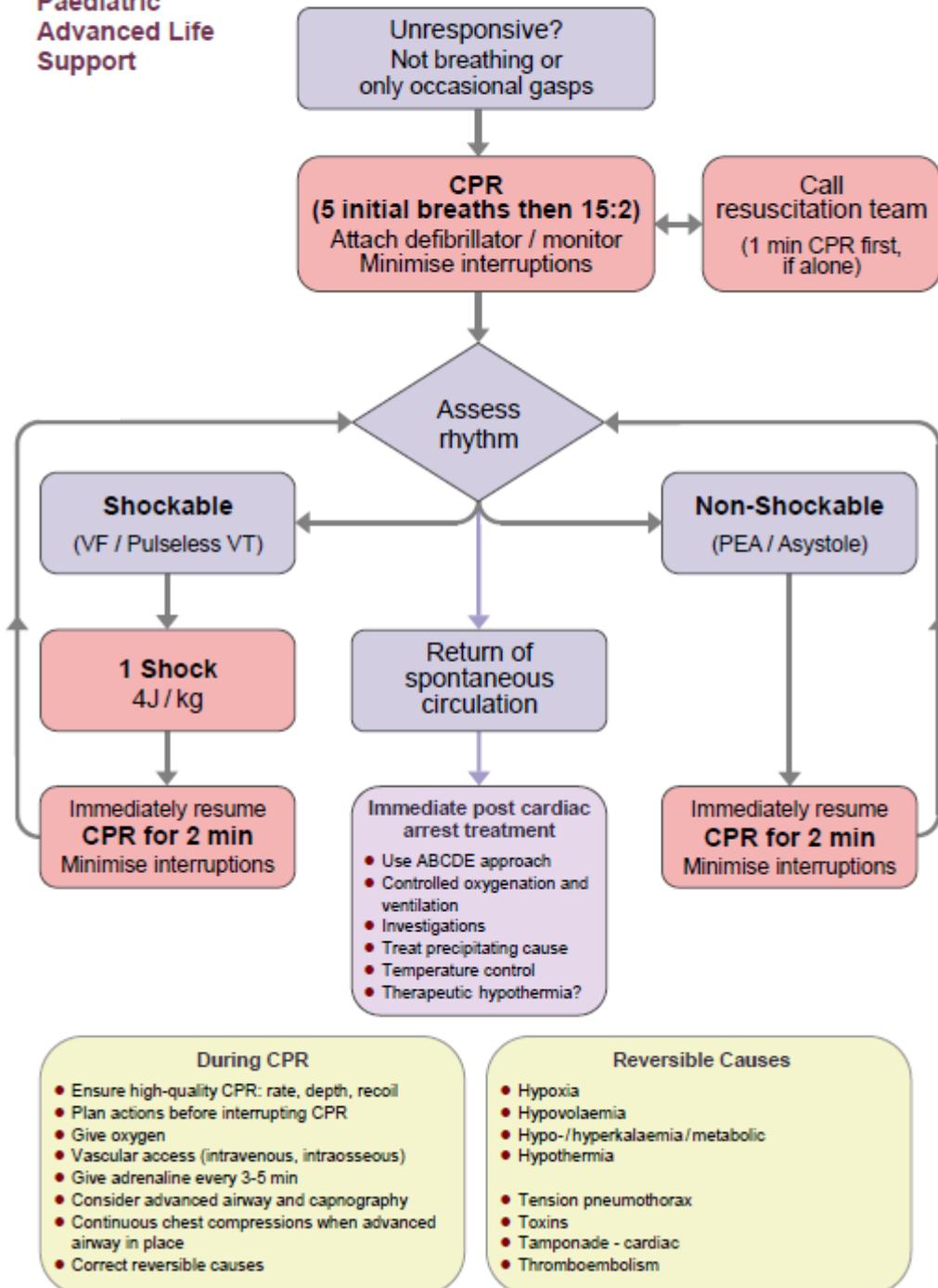


**Call resuscitation team**

# ADVANCED PAEDIATRIC LIFE SUPPORT: CARDIAC ARREST



Paediatric  
Advanced Life  
Support

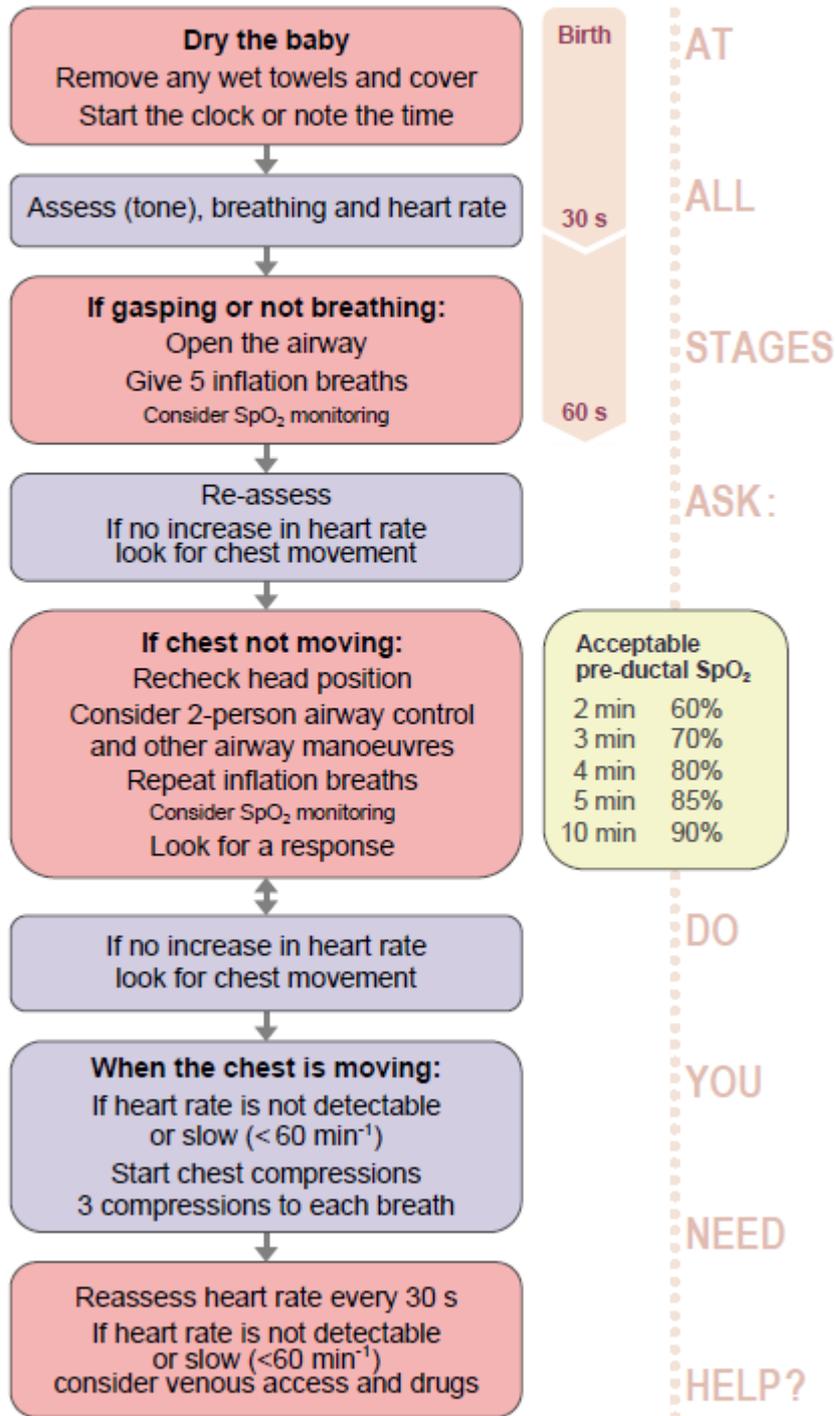


# ADVANCED PAEDIATRIC LIFE SUPPORT: NEWBORN LIFE SUPPORT

2010 Resuscitation Guidelines

Resuscitation Council (UK)

## Newborn Life Support



## ADVANCED PAEDIATRIC LIFE SUPPORT: BRADYCARDIA

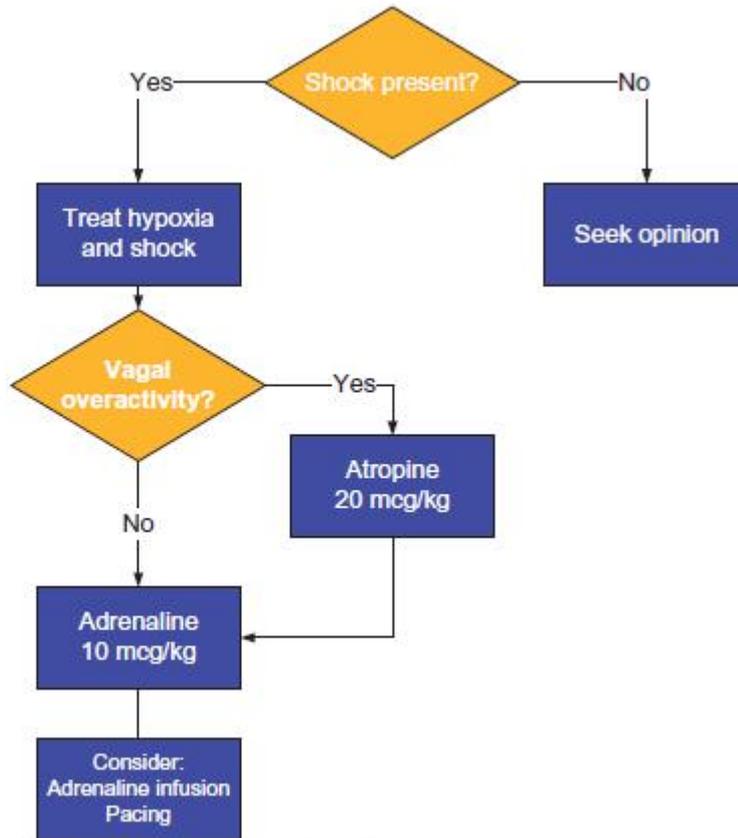


Figure 10.1 Algorithm for the management of bradycardia

# ADVANCED PAEDIATRIC LIFE SUPPORT: SUPRAVENTRICULAR TACHYCARDIA

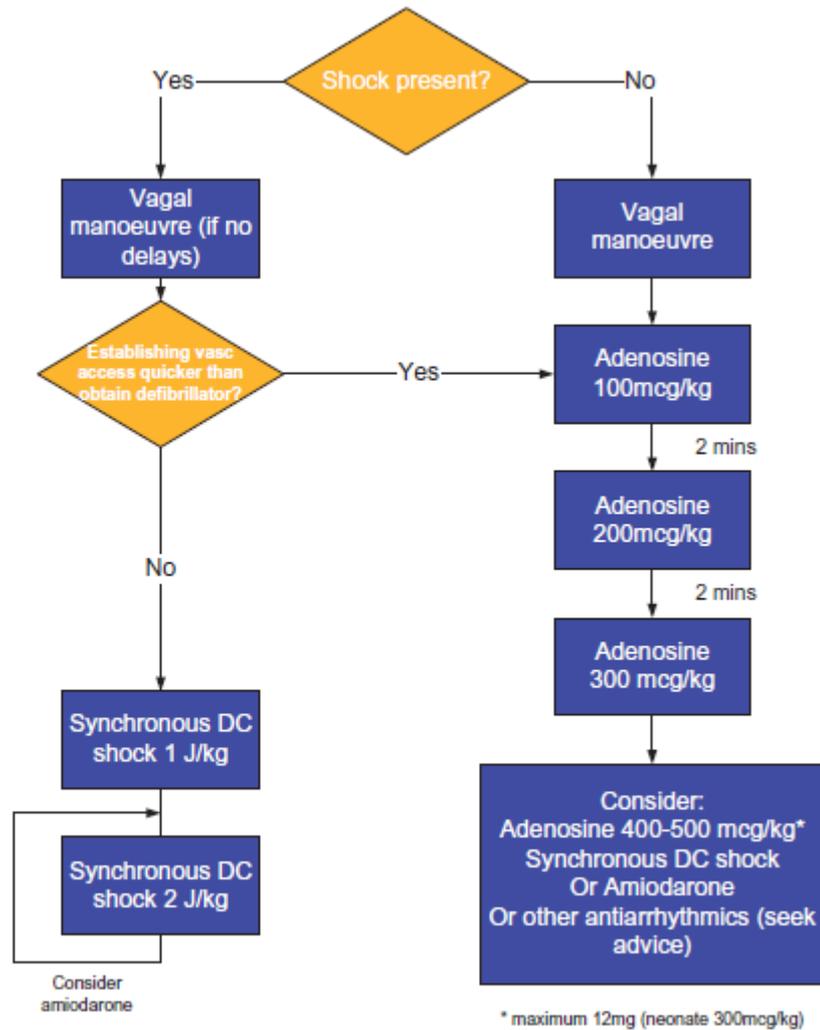
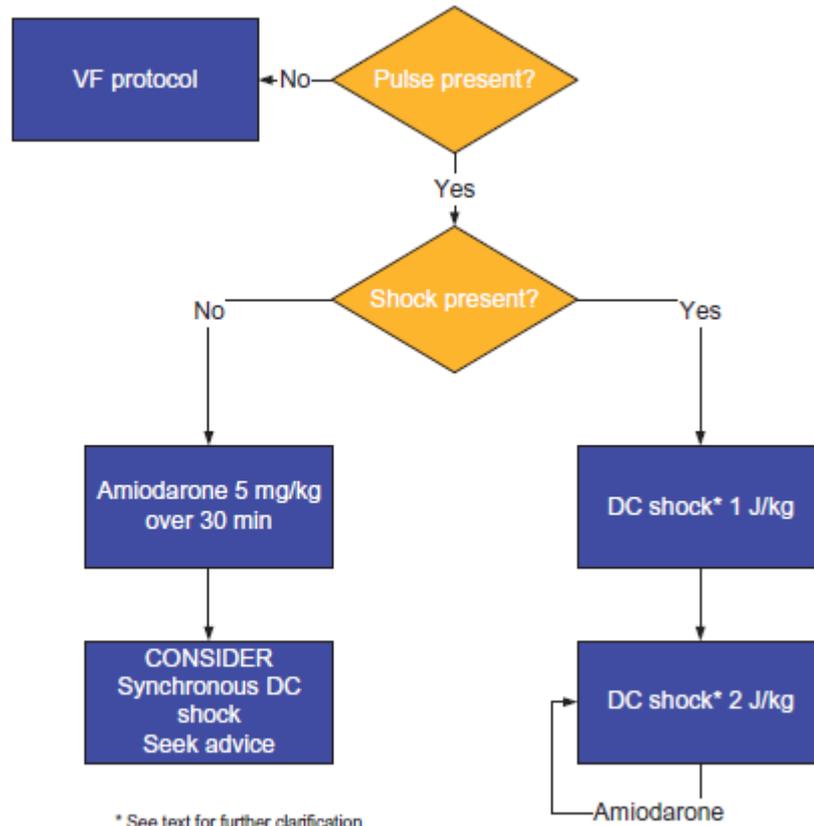


Figure 10.4 Algorithm for the management of supraventricular tachycardia

# ADVANCED PAEDIATRIC LIFE SUPPORT: VENTRICULAR TACHYCARDIA



\* See text for further clarification

Figure 10.5 Algorithm for the management of ventricular tachycardia

# ADVANCED PAEDIATRIC LIFE SUPPORT: FITTING CHILD

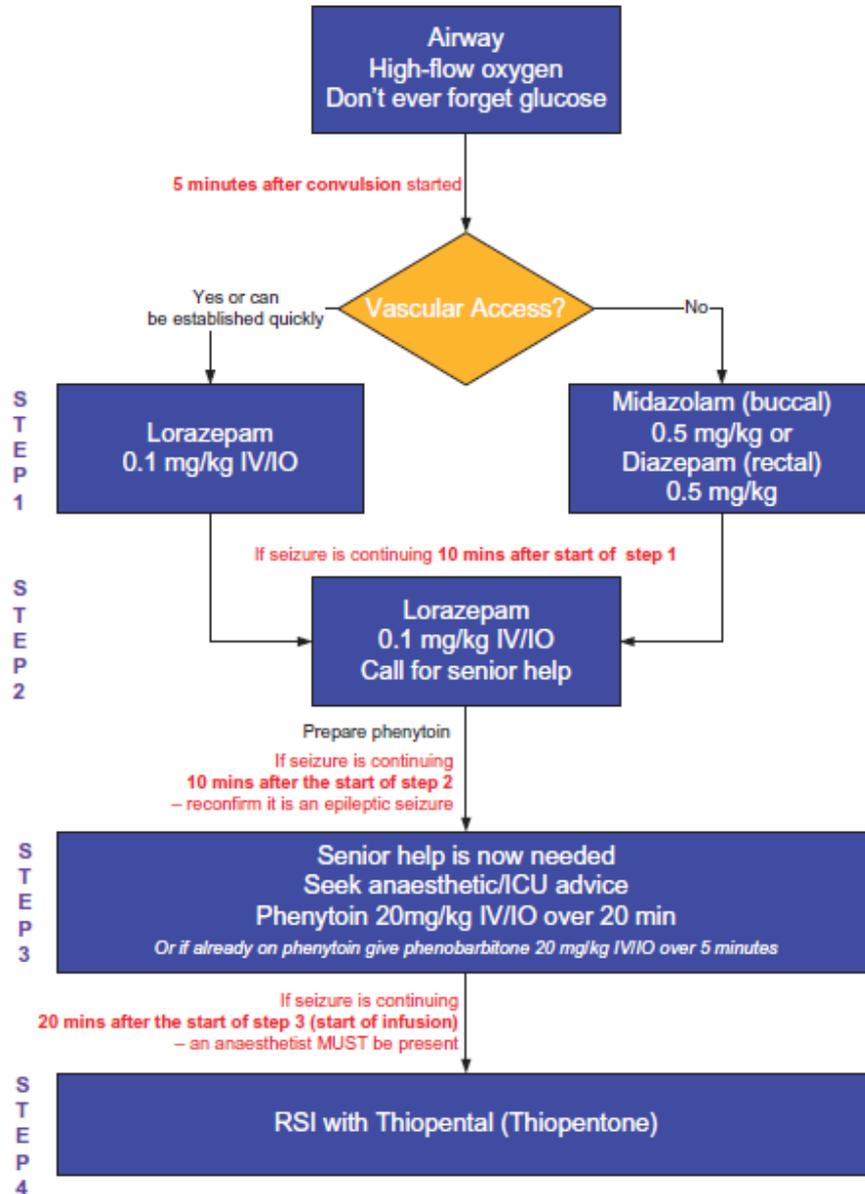


Figure 12.1 Status epilepticus algorithm. ICU, intensive care unit; RSI, rapid sequence induction

# THE UNCONSCIOUS CHILD

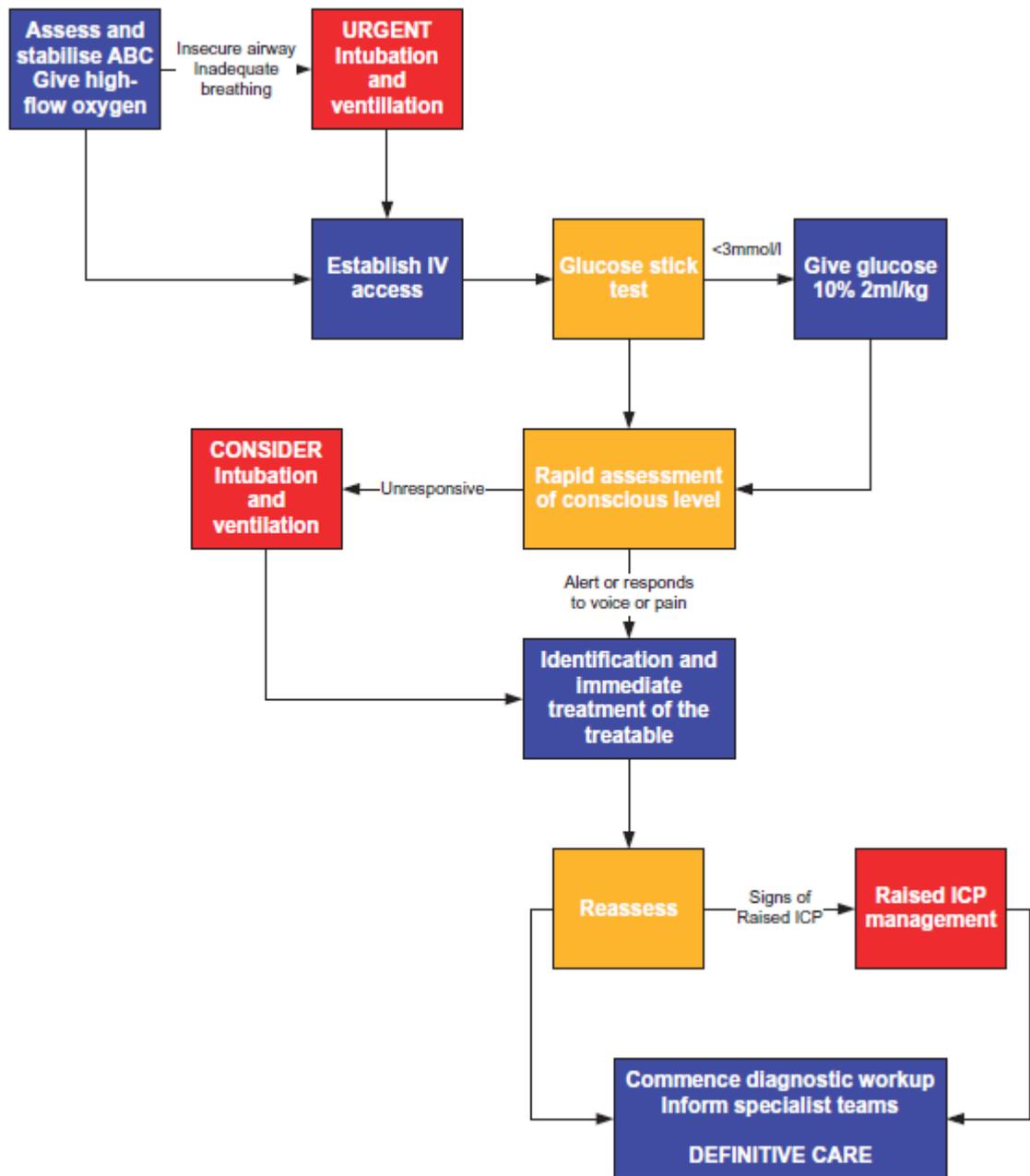
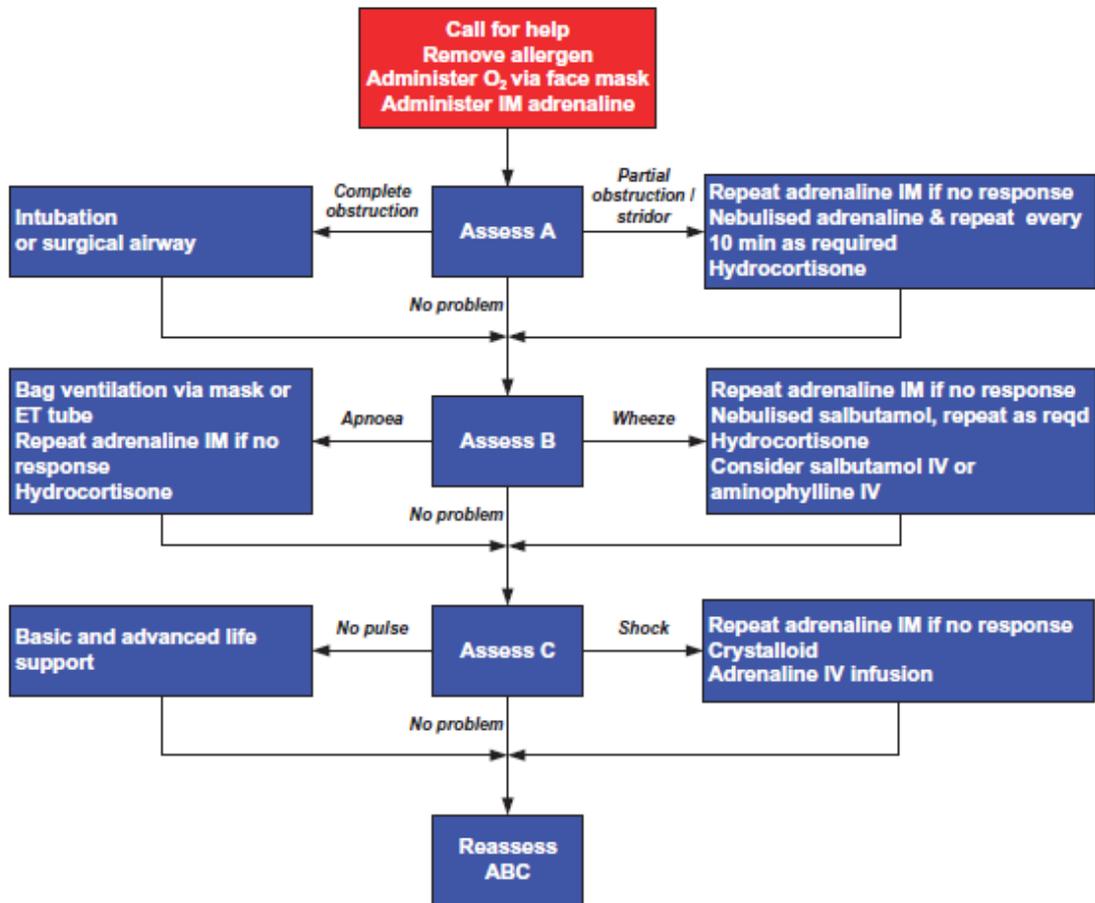


Figure 11.2 Algorithm of the initial management of coma. ICP, intracranial pressure

**The Paediatric Glasgow Coma Scale**

Glasgow Coma Scale (4–15 years)		Children's Glasgow Coma Scale (<4 years)	
Response	Score	Response	Score
<i>Eye opening</i>		<i>Eye opening</i>	
Spontaneously	4	Spontaneously	4
To verbal stimuli	3	To verbal stimuli	3
To pain	2	To pain	2
No response to pain	1	No response to pain	1
<i>Best motor response</i>		<i>Best motor response</i>	
Obeys verbal command	6	Spontaneous or obeys verbal command	6
Localises to pain	5	Localises to pain or withdraws to touch	5
Withdraws from pain	4	Withdraws from pain	4
Abnormal flexion to pain (decorticate)	3	Abnormal flexion to pain (decorticate)	3
Abnormal extension to pain (decerebrate)	2	Abnormal extension to pain (decerebrate)	2
No response to pain	1	No response to pain	1
<i>Best verbal response</i>		<i>Best verbal response</i>	
Orientated and converses	5	Alert; babbles, coos words to usual ability	5
Disorientated and converses	4	Less than usual words, spontaneous irritable cry	4
Inappropriate words	3	Cries only to pain	3
Incomprehensible sounds	2	Moans to pain	2
No response to pain	1	No response to pain	1

# ADVANCED PAEDIATRIC LIFE SUPPORT: ANAPHYLAXIS



Drugs in anaphylaxis	Dosage by age			
	Less than 6 months	6 months to 6 years	6 – 12 years	More than 12 years
Adrenaline IM – pre-hospital practitioners	150 micrograms (0.15 ml of 1:1000)		300 micrograms (0.3 ml of 1:1000)	500 micrograms (0.5 ml of 1:1000)
Adrenaline IM – in-hospital practitioners	10 micrograms/kg 0.1ml/kg of 1:10,000 (infants and young children) OR 0.01ml/kg of 1:1000 (older children) <sup>1</sup>			
Adrenaline IV	Titrate 1 microgram/kg*			
Crystalloid	20 ml/kg			
Hydrocortisone (IM or slow IV)	25 mg	50 mg	100 mg	200 mg

\* 1 microgram/kg given over 1 minute (range 30 seconds to 10 minutes), e.g. 0.5 ml/kg of 1:10,000 adrenaline made up to 50 ml saline 0.9% and run at 1ml/min is 1 microgram/kg/min

<sup>1</sup> The strength of IM adrenaline is not intended to be prescriptive, 1:1000 or 1:10,000 could be used depending on what is practicable. The problem with sticking solely to 1:1000 is that when used in infants and small children, you are then drawing up very small volumes

Figure 9.1 Emergency treatment of anaphylaxis

## SUDDEN UNEXPLAINED DEATH IN INFANCY (SUDI)

- *This will present to you as cardio-respiratory arrest in an infant. Commence CRP as per APLS algorithm unless the baby has rigor mortis or stasis skin changes*
- *You must get senior EM (get a nurse to phone the on-call consultant) and get Paediatric help immediately in this situation –bleep 6666 and ask for paediatric arrest team*

### **The patient**

The paediatric registrar will follow the agreed protocol for the investigation of SUDI. This is in the SUDI pack which the registrar will have. The pack is kept on A2.

### **The parents**

- The child should be dressed and a photograph taken in case the parents should ask for this now or at a later date. The parents should be allowed to hold their child for as long as they wish
- They should be told that their baby was dead on arrival +/- it was not possible to resuscitate him/her
- If they ask questions about the cause etc tell them that you do not have the answers yet – it's too soon
- When they are ready for more information tell them that the Coroner must be notified and that the police will be coming to co-ordinate this

### **The Coroner**

A message must be left on the Coroner's answer phone including the name and personal contact number of the doctor who pronounced life extinct. This is usually a senior member of the paediatric team.

### **Other people who need contacted**

GP, Social worker, Health Visitor

### **You**

The death of a child is always difficult for the staff involved, even if expected. Take time to collect your thoughts after the death. It is often helpful to talk it over with senior nursing or medical members of the team, they often have experience of similar situations and will be able to offer you support. Remember that you can talk to your mentor or one of the consultants at any time if you have questions or difficulties with any the treatment of any patient.

## MENINGOCOCCAL SEPTICAEMIA

- *Refer to the [www.meningitis.org](http://www.meningitis.org) management pathway*

### **Presentation**

Features include fever, myalgia, rigors and confusion. By contrast with neurological features seen in meningitis, those with septicaemia usually have a clear sensorium. Early on clinical features are fever, toxic appearance and tachycardia. With progression, features alter to circulatory failure and shock with poor peripheral perfusion and the gap between core and peripheral temperature increases. Oliguria/anuria may develop and lethargy and confusion leading to coma may result as cerebral perfusion diminishes.

***Please note that hypotension is not a feature of shock in children until a pre-terminal stage is reached, even in the face of significant reduction in circulating volume.***

This is a most fulminant infection. Some children may be symptomatic for several days, others die in <12 hours from the onset of first symptom. Pharyngitis may precede onset in some but others simply get ill and hot. Early recognition is the key to success with requires careful examination of febrile children in a good light, looking for evidence of a purpuric rash in those who are more ill. About 10% of patients develop an initial maculopapular rash (blanches on pressure) prior to the onset of purpura (will not blanch on pressure); in others no rash is present, however, look at the conjunctivae since one purpuric spot in an ill, febrile child is enough to begin therapy.

### **Management**

Suspicion goes more than 50% of the way towards actual diagnosis.

- *Assess ABC and treat. Get senior help early*
- *Administer IV ceftriaxone 80mg/kg– (max 2-4g, over 2-4min). Add in ampicillin /amoxicillin 100mg/kg IV in the under 6 months to cover Neisseria.*

The meningococcal packs are in the paediatric resus area, please complete before antibiotics if it will not unduly delay administration of the antibiotic.

## RASHES

- *Children with non-blanching rash and sick septic children with non-specific rashes should be treated for meningococcal disease.*
- *Discharge plans for children with rashes must include Glass Test Advice*

Colour textbooks are invaluable: see shared resource  
AAHEDDocuments\$(\\a248fps01) (K; hugo resources

### Key Facts are given in the table below

Condition	Organism	Clinical Presentation	Treatment
<b>Impetigo</b>	Group A Strep	Vesicles becoming unroofed Honey crust	Polyfax Fucidin Ointment (Oral Flucloxacillin)
<b>Mild Cellulitis</b>	Strep or Staph	Warm, red, swelling	Co-Amoxiclav
<b>Severe cellulitis</b>	Strep or Staph	Above + Systemic illness or periorbital involvement	ADMIT FOR IV TREATMENT OR IV NURSES
<b>Erythema Multiforme</b>		Target lesions incl. Palms & sole	Supportive
<b>Stevens Johnson Syndrome</b>		Above + mucous membrane	ADMIT
<b>Urticaria</b>	Allergic Reaction	"Hives" or nettle rash	1% HC cream
<b>Drug Eruption</b>		Any rash + drug Hx	
<b>Scabies</b>	Scarcoptes scabiei	Papules or nodules esp. flexor creases Burrows between fingers	Malathion or Permethrin +Advice sheet from CI Derm III.
<b>Fifth Disease</b>	Parvovirus	Slapped Cheek	
<b>Kawasaki Syndrome</b>		Erythema, sick, conjunctivitis, mucositis, peeling from fingers or toes	ADMIT
<b>Toxic Shock Syndrome</b>	Staph	Erythema, watery diarrhoea, shock	Flucloxacillin

Condition	Organism	Clinical Presentation	Treatment
Scarlet fever	Group A Strep	Erythema, strawberry tongue	Penicillin
Viral Exanthem		Pin prick rash or pimples. URTI or vague illness.	
Chickenpox	Varicella Zoster	Vesicles on trunk	Risk to pregnant mums- refer to GP for serology/ immunisation
Primary Herpes Stomatitis	H. Simplex	Extensive oral ulcers	Acyclovir Mouthwash
Post-primary HSV	H. Simplex	Cold sores, lip ulcers	Acyclovir Mouthwash
NAI		Bizarre marks, burns	Child protection guidelines
Meningococcal		Non-blanching rash <i>May be extremely subtle at first</i>	IMMEDIATE TREATMENT OR SENIOR OPINION FOR ALL NON-BLANCHING RASHES

## ASSESSING PYREXIA IN CHILDREN (SEE ABC SERIOUSLY ILL CHILD, TRIAGE, VOMITING AND DIARRHOEA)

- *“Time and observations sometimes help the art of medicine..”*
- *Unwell pyrexial children must be taken to resus immediately – the paediatric registrar must be contacted and you should follow the septic child protocol.*

High temperatures are very common in childhood and you are going to see lots of cases while working in the Emergency Department. The parental concern is always meningitis – this should be your main concern as well! Although all children should be seen very promptly there is no rush if your initial assessment excludes serious illness. It is a good idea to keep the child in the department for an hour or two if discharge is a possibility but you are not sure. You can tell the child’s parents that you are going to keep him/her in the Emergency Department for a period of observation.

### **Initial Action**

- The child should have been given an antipyretic by the triage nurse. Make sure that their clothes are removed and that they are cooling down.
- Consider Ametop in all pyrexial/unwell children at triage in case venepuncture is required. Especially all infants under 90 days with temps
- Talk to the child’s parents and listen to what they tell you.
- Carry out a full top-to-toe examination including assessment of general appearance, cardiorespiratory exam, abdominal exam, rashes and ENT examination.
- If no obvious cause for the fever is found urinalysis must be carried out and a specimen sent to the lab for direct microscopy. Chest X-ray should be considered and is mandatory if there is any abnormality of respiratory rate or SaO<sub>2</sub>.

### **Admitting or discharging**

- Less than 28 days old – *admission is always mandatory.*
- 28 days to 90 days – discuss with ED consultant or paediatric reg
- Older than 90 days – assessment becomes more reliable so children older than three months may be discharged by the Emergency Department doctors if well. A senior ED doctor must sign off all pyrexial children under 1 year old.

## VOMITING AND DIARRHOEA – THE DEHYDRATED CHILD (SEE SERIOUSLY ILL CHILD, TRIAGE, ASSESSING PYREXIA)

- *Very ill children should be taken to resuscitation immediately and paediatric registrar contacted.*
- *The main aim with diarrhoea and vomiting in children is to determine the child's hydration status and stabilise. The underlying cause should then be sought.*

The most common cause is acute gastro-enteritis (which is usually viral) but systemic bacterial infection may also be present in this way. In very young children, vomiting is due to faulty feeding, over feeding, regurgitation (GOR) or an obstructive lesion (pyloric stenosis, malrotation). Don't forget that intussusception causes colic, pale/screaming attacks and diarrhoea/blood PR – an abdominal X-ray should be taken if this is suspected.

### **Action**

- Give dioralyte 5mls every 5 mins, get parents to chart amount taken (this will hopefully have been started by the triage nurse)
- Take a good history, in particular, the number of wet nappies, tears, timing of vomiting, contents of vomiting and type of vomiting (projectile) and number of dirty nappies. Listen to parents (unfortunately this may mean looking at a dirty nappy that has been specially saved for you!).
- On examination note mental status, mucous membrane, tears and capillary refill.
- Carry out a good examination, as you would for a pyrexia child, remembering urine test.
- Following your history and examination, decide if dehydration is
  - mild (3%), moderate (5%) severe (8%).
- For mild dehydration try a small bottle of dioralyte (if not already tried). Child can be discharged home if tolerating this and remains well after a period of observation.
- Moderate to severe dehydration will need admission for parenteral fluids. Contact the Paediatric team who will calculate fluid replacement.
- Admit all children who are not feeding / tolerating oral fluids

### **Advise parents**

- Clear fluids only – regularly and small amounts.
- Dioralyte.
- Advance to simple foods as tolerated.
- Do not give milk (cow) or fruit juices.
- Give simple advice about preventing faecal-oral spread of infection.

- To come again SOS if:
  - diarrhoea and vomiting continues after 24 hours
  - blood in stool or vomit signs of dehydration develop.

### **Assessment of Dehydration Levels in Infants**

Signs	Severity		
	Mild	Moderate	Severe
General condition	Thirsty, restless, agitated	Thirsty, restless, irritable	Withdrawn, somnolent, or comatose; rapid deep breathing
Pulse	Normal	Rapid, weak	Rapid, weak
Anterior fontanelle	Normal	Sunken	Very sunken
Eyes	Normal	Sunken	Very sunken
Tears	Present	Absent	Absent
Mucous membranes	Slightly dry	Dry	Dry
Skin turgor	Normal	Decreased	Decreased with tenting
Urine	Normal	Reduced, concentrated	None for several hours
Weight loss	4%-5%	6%-9%	>10%

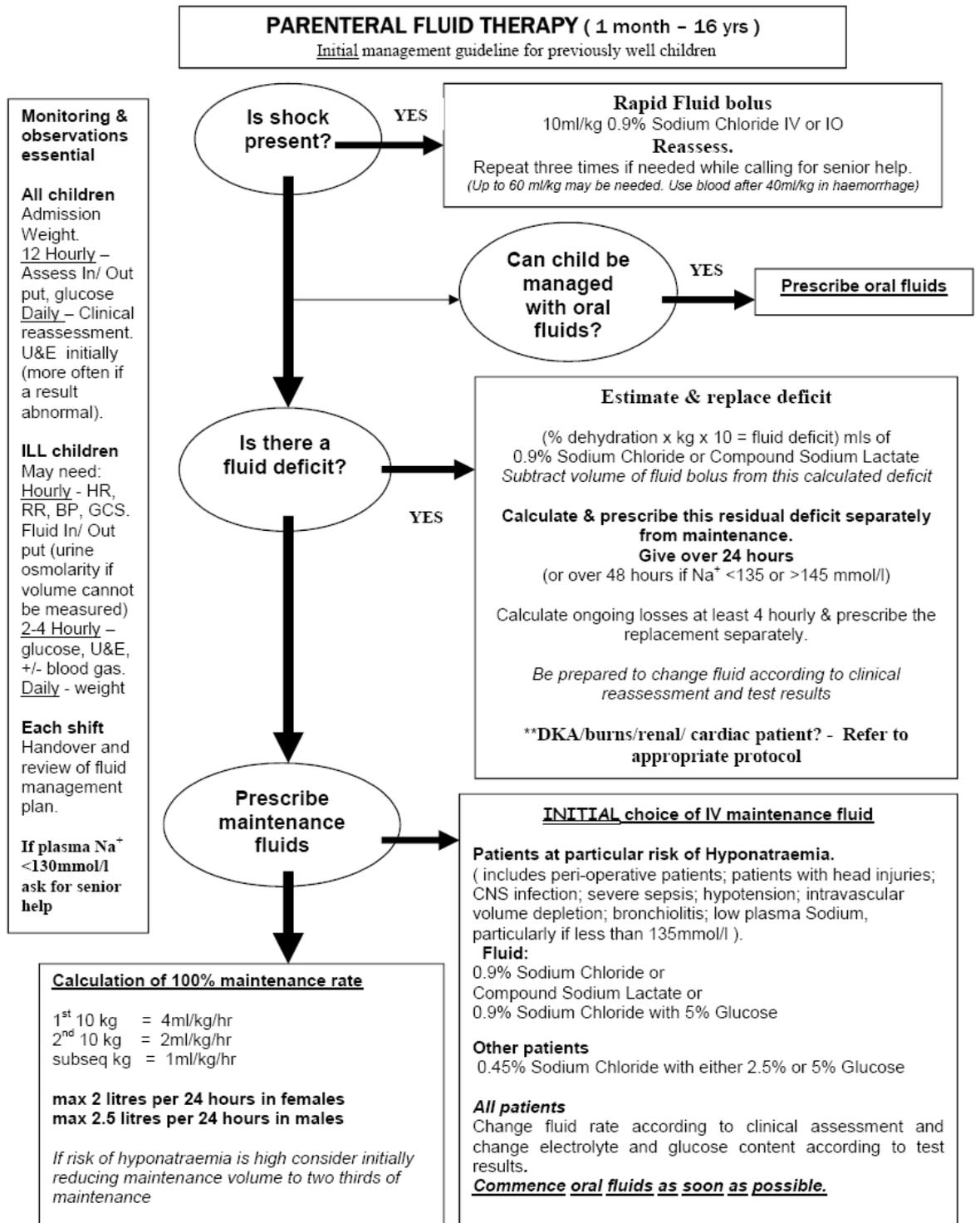
### **Intravenous fluids**

IV Fluids must be prescribed on a Paediatric Fluid Balance Chart

ED medical staff should only prescribe and administer fluid boluses for shocked children and dextrose for hypoglycaemic children.

Fluids or maintenance and on-going losses must only be prescribed by the inpatient paediatric medical team.

See next page for further guidance.

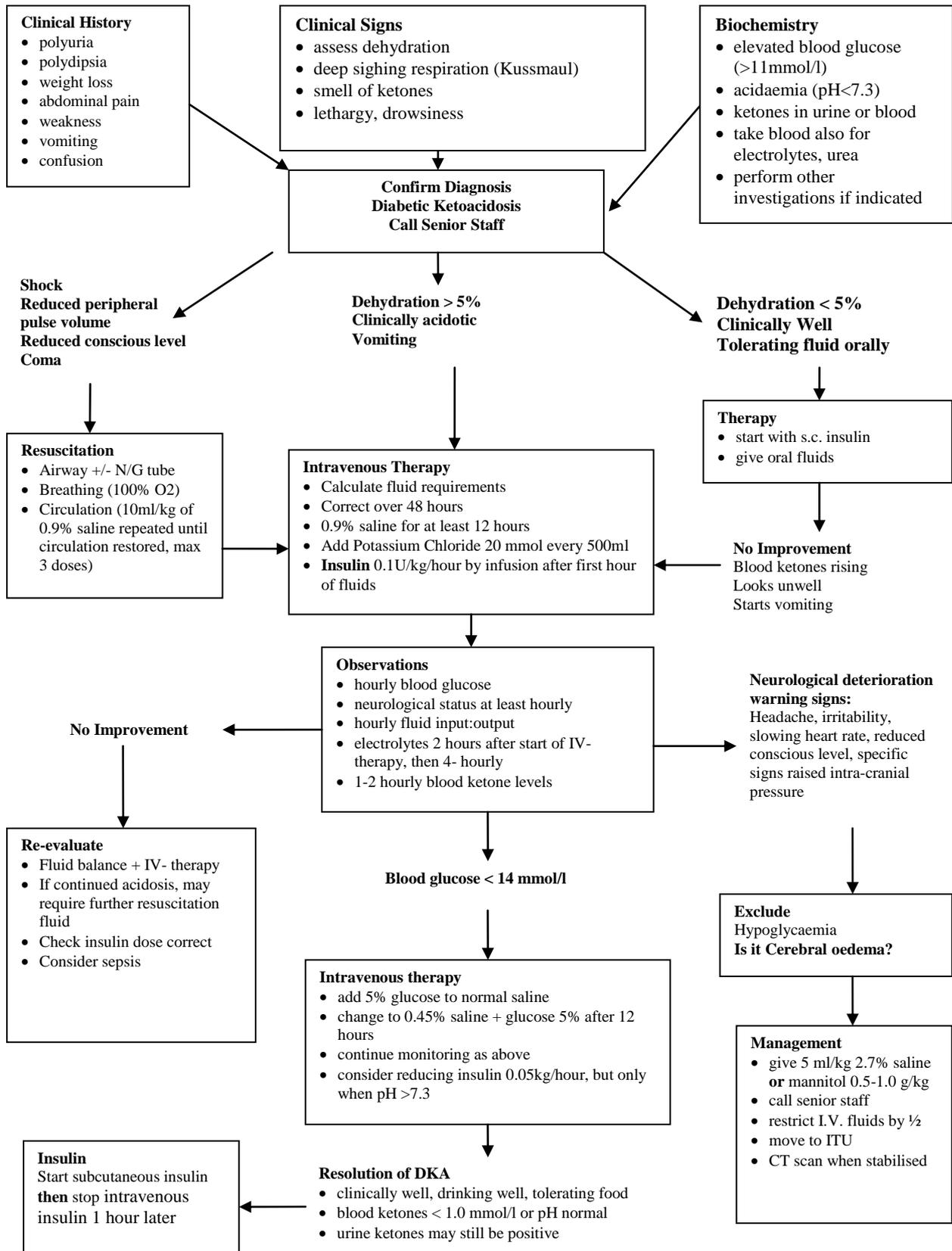


**IV Maintenance K<sup>+</sup>** normally required after 24 hrs (be aware of potential for K<sup>+</sup> deficit at presentation e.g. pyloric stenosis).  
**Replace ongoing losses** with the same volume of either 0.9% Sodium Chloride or Compound Sodium Lactate.  
**Oral intake** must be considered in the fluid prescription calculation.  
**Medications:** volumes of drug infusions and oral medications must be considered in the fluid prescription.  
**Hypoglycaemia** (<3mmol/l): give 5ml/kg bolus of 10% Glucose. Recheck after 15-30 mins; change maintenance fluid.  
**Symptomatic Hyponatraemia:** features include nausea, vomiting, headache, irritability, altered level of consciousness, seizure, apnoea.

# PAEDIATRIC DKA

## Algorithm for the Management of Diabetic Ketoacidosis in Children & Young People up to 18 Years

1. The paediatric registrar should *always* be contacted for advice
2. IV fluids are calculated by weight.
3. All cases must be discussed with a senior doctor



# ASTHMA

## Age 2-5 years



Age > 5 years



# BRONCHIOLITIS

## Bronchiolitis Guideline

### Bronchiolitis Clinical Guideline 2010

<p><b>Admission Criteria</b></p> <ul style="list-style-type: none"> <li>• Oxygen saturations persistently less than 92% in room air</li> <li>• Risk of severe disease             <ul style="list-style-type: none"> <li>* Premature birth and/or bronchopulmonary dysplasia</li> <li>* Congenital heart disease</li> <li>* Immune deficiency</li> </ul> </li> <li>* Marked respiratory distress</li> <li>* Apnoeic spells</li> <li>* Need for frequent nasopharyngeal suction</li> <li>* Failed trial of feeding or feeding less than 50% normal</li> <li>* <i>Beware: Young infants early in course of illness (neaks day 3-4)</i></li> </ul>	<p><b>Management</b></p> <p><b>Supportive therapy</b></p> <ul style="list-style-type: none"> <li>• Keep O2 saturations above 92% in the acute phase</li> <li>• Suction of nasopharyngeal secretions</li> </ul> <p><b>Fluid management</b></p> <ul style="list-style-type: none"> <li>• Trial of oral or nasogastric feeds using small frequent boluses             <ul style="list-style-type: none"> <li>○ Mild to moderate cases</li> <li>○ Consider aspiration risk; may need to restrict to 2/3 maintenance</li> </ul> </li> <li>• IV fluids             <ul style="list-style-type: none"> <li>○ More severe cases</li> <li>○ Failed trial of enteral feeding</li> <li>○ Imminent intubation</li> <li>○ Restrict 2/3 maintenance and follow fluid management guidance</li> </ul> </li> </ul> <p><b>Nebulised Therapy</b></p> <p style="background-color: #cccccc; padding: 5px; text-align: center;"><b>4ml 3% Saline given 8-hourly</b></p> <p><b>Adrenaline (Severity score &gt; 8)</b>  <i>Document severity score before and after use, and continue use only if there is a proven effect. Prove it works, or don't use it.</i></p> <p style="background-color: #cccccc; padding: 5px; text-align: center;">1.5 ml Adrenaline 1/1000 added to 4 ml hypertonic saline (8-hourly)</p> <p style="background-color: #cccccc; padding: 5px; text-align: center;">1.5 ml Adrenaline 1/1000 mixed 1:1 with 0.9% Saline</p> <p>Adrenaline can be added to doses of hypertonic saline</p> <p>Additional doses of nebulised adrenaline may be given where necessary</p>																														
<p><b>Investigations</b></p> <ul style="list-style-type: none"> <li>• CXR and blood investigations are not indicated in clinically diagnosed, uncomplicated bronchiolitis</li> <li>• Nasopharyngeal secretions for RSV status can help cohort patients and may decrease the use of antibiotics</li> </ul>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Score</th> <th>0</th> <th>1</th> <th>2</th> <th>3</th> </tr> </thead> <tbody> <tr> <td>Respiratory Rate &lt;6 months</td> <td>&lt;40</td> <td>40-55</td> <td>56-70</td> <td>&gt;70</td> </tr> <tr> <td>RR. &gt; 6 months</td> <td>&lt;30</td> <td>30-45</td> <td>46-60</td> <td>&gt;60</td> </tr> <tr> <td>Wheezing</td> <td>None</td> <td>End-expiratory</td> <td>Inspiratory and expiratory with stethoscope</td> <td>Audible wheeze</td> </tr> <tr> <td>Retractions</td> <td>0</td> <td>+</td> <td>++</td> <td>+++</td> </tr> <tr> <td>Supplemental O2</td> <td>None</td> <td>21-28% Nasal prongs 100% O2: &lt; 2L</td> <td>29-35% Nasal prongs 100% O2: (2-4 L)</td> <td>&gt;35% Nasal prongs: &gt;4L</td> </tr> </tbody> </table>	Score	0	1	2	3	Respiratory Rate <6 months	<40	40-55	56-70	>70	RR. > 6 months	<30	30-45	46-60	>60	Wheezing	None	End-expiratory	Inspiratory and expiratory with stethoscope	Audible wheeze	Retractions	0	+	++	+++	Supplemental O2	None	21-28% Nasal prongs 100% O2: < 2L	29-35% Nasal prongs 100% O2: (2-4 L)	>35% Nasal prongs: >4L
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<p><b>Discharge</b></p> <ul style="list-style-type: none"> <li>• Feeding ideally 75% normal</li> <li>• Some symptoms will persist for 2 weeks (40%) and in some cases 4 weeks (10%) after onset</li> <li>• Illness peaks at day 3-4, so symptoms may worsen before improving and child may need to be reassessed</li> <li>• In the recovery phase, some infants may be clinically well but have oxygen saturations of 90 – 94%, and may be considered for discharge.</li> </ul>																															

## MAJOR TRAUMA IN CHILDREN (SEE SERIOUSLY ILL CHILD, UNCONSCIOUS CHILD AND HEAD INJURY)

- *Dial 6666. Follow the trauma and paediatric triage protocols. You Can Follow The Sequence for 'Seriously Ill Child' With Modifications*

A: Airway manoeuvres / adjuncts as necessary. Anaesthetics / paediatrics if needs intubated

### **Cervical spine stabilisation:** ref. Serious injury update APLS Instructors Information 2015

In-line with the new FPHC consensus guideline<sup>1</sup> the approach to spinal immobilisation is a stepwise approach following the current algorithm (see Figure 13.5 in APLS manual). The method of stabilisation should be considered carefully:

- Manual in-line stabilisation (MILS)
- Blocks where necessary if suggested by mechanism of injury (see NIHCE guidance)
- There is no evidence of the benefit of using collars in children and in many cases they are contraindicated e.g. penetrating trauma and, therefore, their use will no longer be routinely taught on APLS, APLS recertification and PLS courses
- Spinal board used only for extrication with rapid transfer to a scoop stretcher for transportation and early removal from scoop stretcher in ED
- Minimal handling with 20° tilt is recommended (rather than log roll) as described in the FPHC consensus guidelines<sup>1</sup>
- **THIS MEANS THE TRAUMA TEAM LEADER (usually EM Consultant / SpR MAY WELL INSTRUCT REMOVAL OF COLLAR ON ARRIVAL**

B: Breathing assessment including RR and oxygen sats

High flow oxygen

Ventilate if poor respiratory effort or tachypnoea

C: Venous access – IV if easily obtained otherwise IO using IO gun kept in paed resus bay

Haemorrhage identify potential source and control

Fluid resuscitation 0.9% normal saline 10mls/kg, repeated if not responding, after 20mls / kg needs senior surgical team involvement, after 40ml / kg needs resuscitation by blood transfusion

D: AVPU, eyes, posture

Check glucose

Log roll (PR rarely indicated and should only be performed by experienced surgeon)

E: Exposure to complete assessment but cover quickly to avoid heat loss

## AMPLE History

Allergies

Medications

Past medical history

Last meal

Events leading

Continue to reassess ABCDE

Imaging as indicated

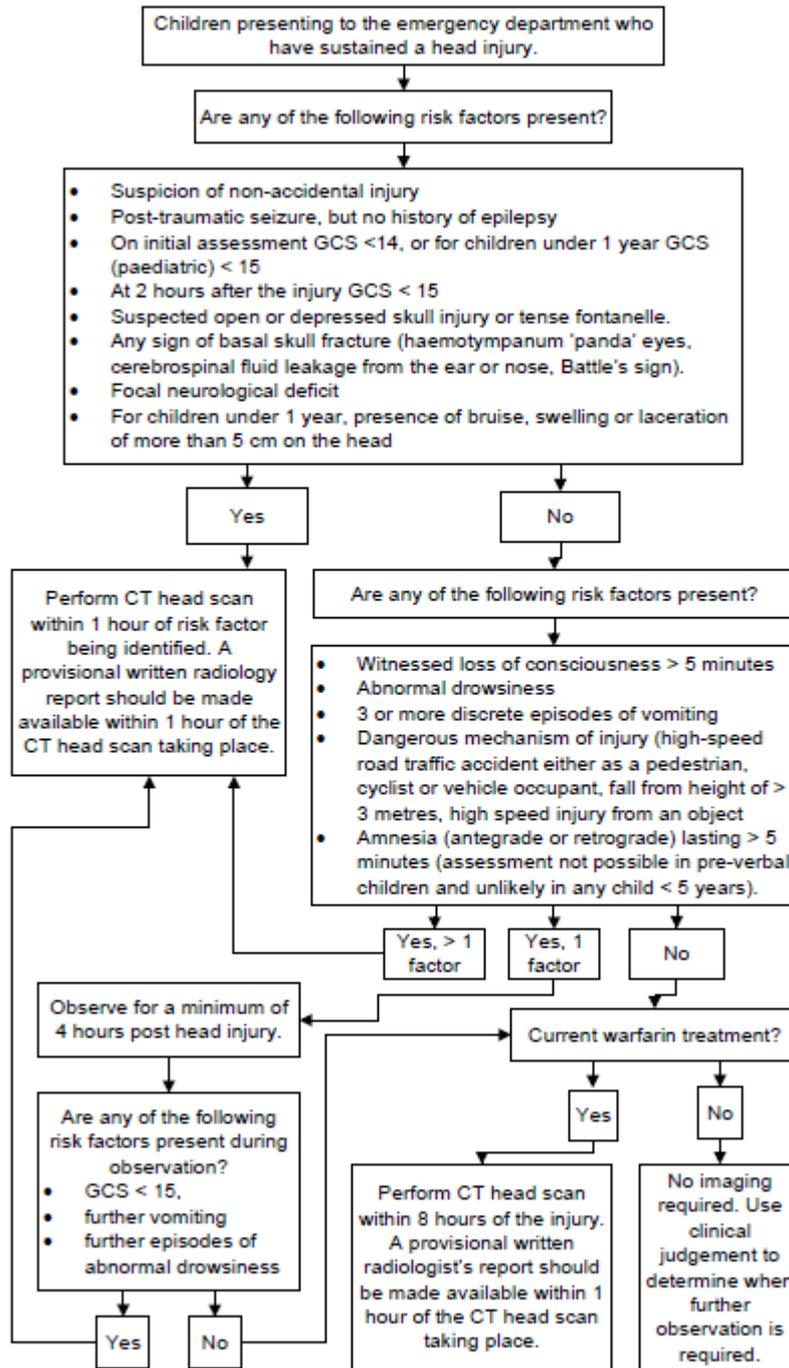
Secondary survey

**Signs Indicating Blood Loss Requiring Urgent Treatment**

Sign	Indicator
Heart rate	Marked or increasing tachycardia or relative bradycardia
Systolic BP	Falling
Capillary refill time (normal <2s)	Increased to >4–5s
Respiratory rate	Tachypnoea unrelated to thoracic problem
Mental state	Altered conscious level unrelated to head injury

# HEAD INJURY – NICE 2014

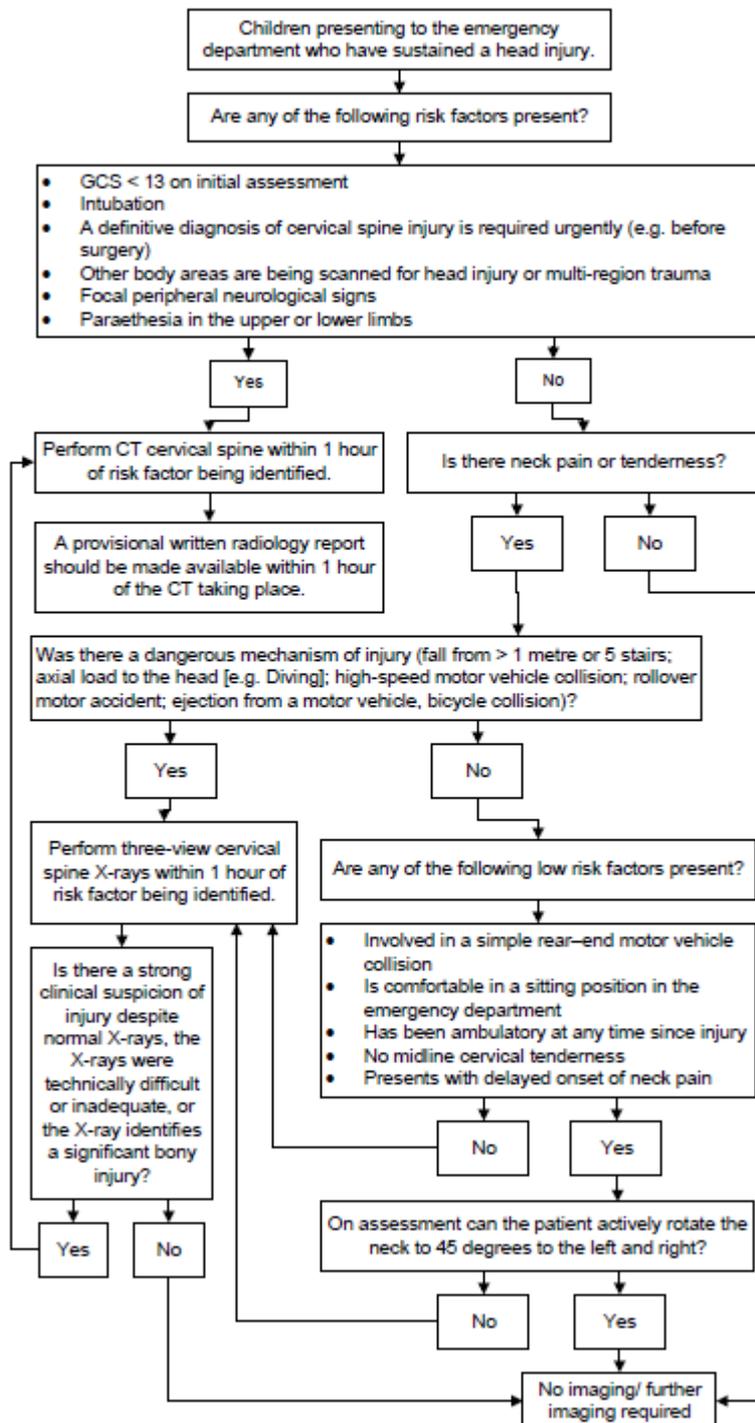
**Algorithm 2: Selection of children for CT head scan**



# CERVICAL SPINE INJURY – NICE 2014

## Please read PAGE 233

**Algorithm 4: Selection of children for imaging of the cervical spine**



## THE LIMPING CHILD

### **Initial Management**

Full history and examination after adequate analgesia

Examination must include back and abdomen in all and genitalia in boys

Check temperature

### **Differential Diagnoses**

1. Any site: Fracture – specifically exclude toddler’s fracture and femoral shaft  
Soft tissue injury  
Septic arthritis – systemically unwell, pyrexial, decreased ROM of joint  
Osteomyelitis – may not be systemically unwell  
Neoplasia – e.g. leukaemia  
Rheumatological conditions
2. Knee: Remember pain in the knee can be referred from the hip
3. Hips: Irritable hip – transient synovitis with effusion that causes painful hip, systemically well, may have had recent viral illness  
Perthe’s disease – an osteochondritis of the upper femoral epiphysis affecting typically 3-10 years  
SUFE – slipped upper femoral epiphysis, typically 8-15 years  
Congenital problem – eg missed developmental dysplasia of the hip
4. Back: e.g. Discitis
5. Abdomen: e.g. Peritonitis, hernias
6. Genitalia: e.g. Testicular torsion

### **Red Flags**

Non-accidental injury

Malignancy

Sickle cell disease

Sepsis

Rheumatology – leg length discrepancy, multiple joint involvement

General – systemically unwell, non-weight bearing, limping > 4 weeks

### **Management**

X-ray all injuries. Also x-ray tibias of toddlers to exclude Toddler’s fracture  
X-rays of hips if systemically well and no history of injury (need frog leg in over 8). Refer to Ortho in RBHSC if abnormal

If x-rays normal prescribe regular analgesia and arrange review in the ED injury review clinic in 48-72 hours

If systemically unwell or red flag symptoms seek senior ED opinion – may need bloods etc.

## FRACTURES

Paediatric bony injuries tend to be different from adults due to the weakness of a child's bone (the ligaments are far stronger than bone) and the presence of growth plates.

The epiphyseal plates mean 2 things:

1. x-rays are harder to look at (especially elbows)
2. fractures tend to occur around these areas.

### **1. Elbow injuries**

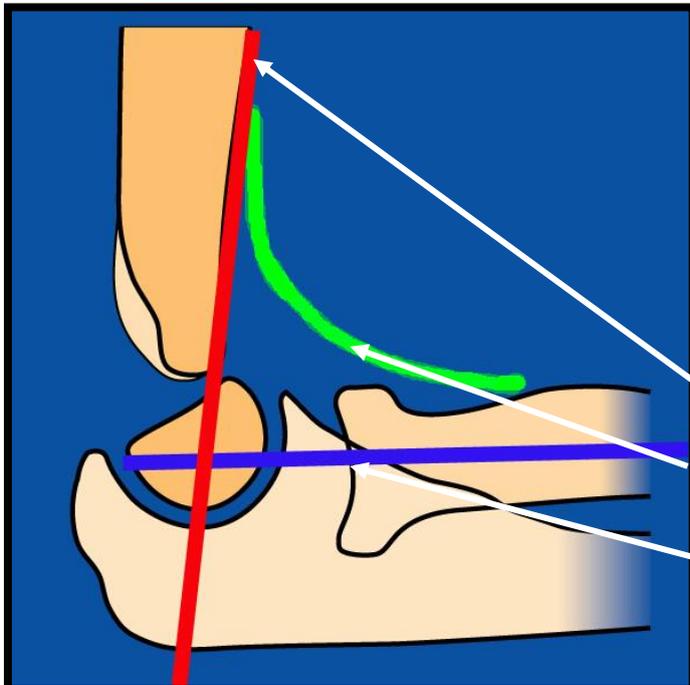
These are very common in children.

Familiarise yourself with a normal lateral x-ray of the elbow.

- Anterior humeral line: important for supracondylar fractures
  - Drawn tangential to anterior humeral cortex on a true lateral view,
  - Normally passes through the middle or posterior third of the ossified capitellum.
  - Note this line is not helpful when the capitellum is small (child < 2 years)
- Radio-capitellar line:
  - drawn bisecting the radial shaft, normally passes through the capitellum on all views;
  - if it does not, suspect radial head or complete elbow joint dislocation
- Fat pads: there are 2 (anterior and posterior)
  - Fat pad displacement is a response to distension of the joint capsule from an effusion or blood – it implies a fracture or serious soft tissue injury

### **Management**

1. Long arm backslab if obvious fracture on x-ray, fat pads or child unable to straighten arm after elbow injury.
2. Refer all fractures to fracture clinic – supracondylar fractures require discussion with fractures that day
3. Review all other elbow injuries in the ED clinics in 10 days



Normal elbow demonstrating radiographic lines:

**anterior humeral line,**  
**coronoid line,**  
**radio-capitellar line.**

## 2. Salter Harris Fractures

These are very common fractures in children.

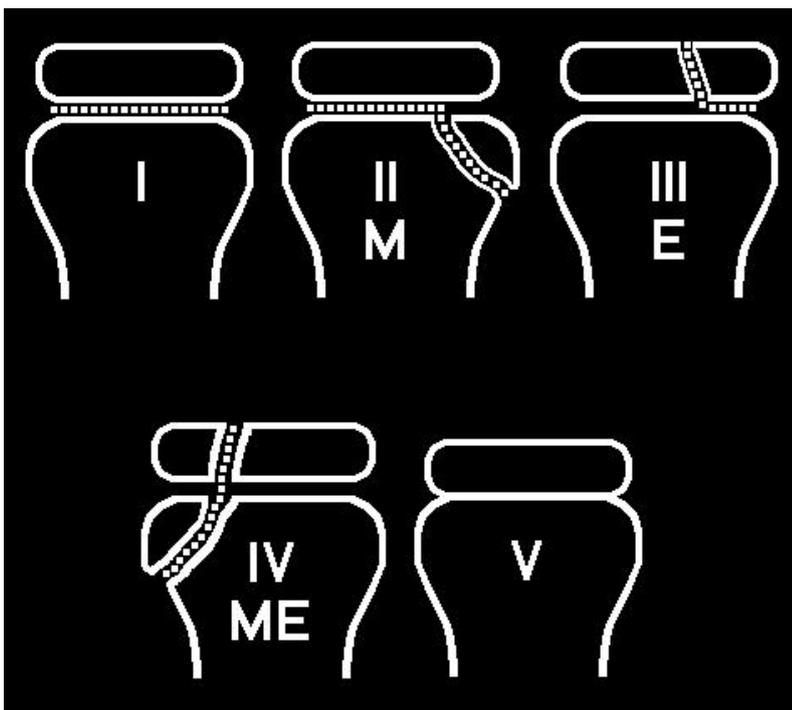
They tend to be missed in the fingers and metacarpals and around ankles.

Type II are the most common.

In children with sore fingers localise pain & request an x-ray of specific part.

Missed fractures occur because x-rays of hands are taken as opposed to an x-ray of the painful finger or metacarpal.

**Salter Harris classification:**



## ZIP ENTRAPMENT IN CHILDREN

Little boys and big boys occasionally zip up too quickly and manage to entrap their foreskins within the zip. Discuss with the child and explain to the parents what is happening.

If a child is very distressed consider immediate ENTONOX OR oral sedation.

15% entrap by the teeth of the zip.

Management: *Cut the zip at its base and it will open releasing the foreskin.*

85% entrap by the zip fastener itself.

Management: *Use topical anaesthetic gel. Try to gently remove zip. If obviously badly trapped may need a GA. Give intranasal diamorphine for the pain (not with midazolam!).*

Alternatively, Entonox and a local anaesthetic injection into the entrapment site or penile block. Then remove the zip.

## NON-ACCIDENTAL INJURY

- *ALL THESE SITUATIONS REQUIRE URGENT CONSULTATION WITH A SENIOR DOCTOR IN SENIOR EMERGENCY DEPARTMENT/PAEDIATRICS.*

Emergency Department SHOs are not expected to diagnose NAI or to confront parents but they are expected to be alert to the possibility and to report any suspicions to a doctor experienced in dealing with such cases.

If you suspect NAI, speak to a senior member of the ED staff or contact the Paediatric Registrar immediately. Make a meticulous record of the history and physical findings and tell the parents that you feel that you need a second opinion on their child.

### **Reasons for suspecting NAI\* include -**

- Abnormal patterns of injury e.g. slap marks, cigarette burns, bite marks
- History inconsistent with type of injury e.g. # long bones in an infant unable to walk
- Unexplained injuries e.g. old bruises
- Delay in presentation
- Child brought to the Emergency Department by someone other than parent
- Abnormal behaviour in child e.g. withdrawn, poor rapport with parent
- Signs of physical neglect
- Frequent attendances

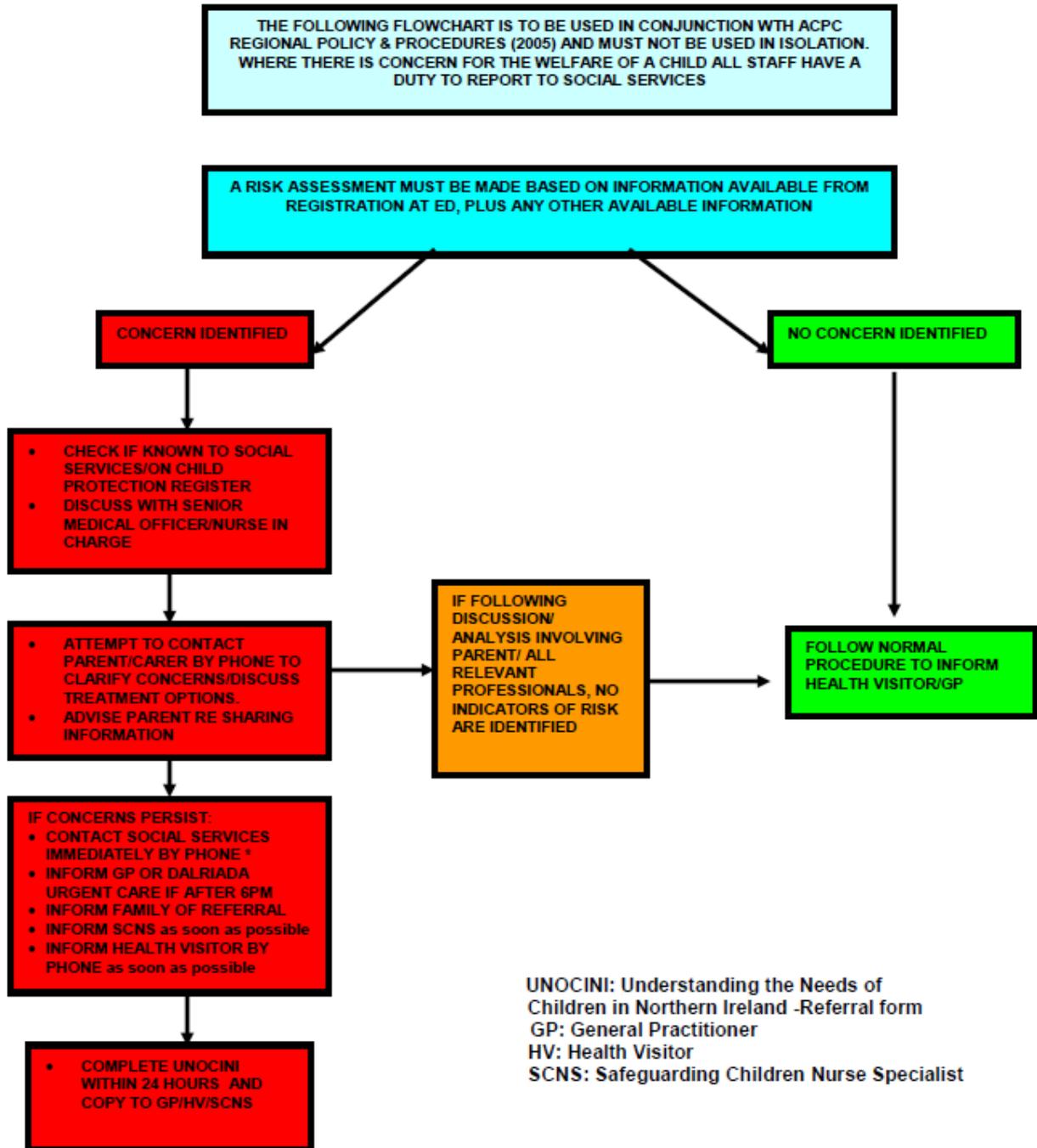
\*Don't forget that there is often an innocent explanation for suspicious situations and diseases (e.g. bleeding disorders) can mimic NAI.

**METICULOUS NOTE KEEPING IS MANDATORY – DO NOT WRITE NAI/?NAI IN THE NOTES. PLEASE RECORD YOUR CONCERNS**  
eg “*I need an experienced opinion to confirm that the history given is consistent with the physical findings*” etc.

### **Reasons for Suspecting Sexual Abuse include:**

Disclosure or other member of the family  
 Underage pregnancy  
 Genital injury  
 Sexually transmitted disease  
 Precocious sexual behaviour  
 Deliberate self-harm / behaviour problems

# GUIDELINE FOR ED STAFF WHEN A CHILD LEAVES WITHOUT BEING ASSESSED OR TREATED



## PAIN RELIEF

- *Weigh all children to and prescribe analgesia based on weight. Always check the BNF.*

**Paracetamol:** 15mg/kg orally QID

**Ibuprofen:** 5-10mg/kg orally TID

**Morphine:** 0.1mg/kg IV

**Diamorph:** Intranasal use. Use the following guide (also in resus). Add the appropriate amount of water to the diamorphine. The dose to be delivered is 0.2ml of the solution. Draw up extra so that you can prime the atomiser with the solution first.

AGE	EST WGT	MLS to add to 5MG of Diamorphine	MG in 0.2ml of solution
1	10	1.0	1mg
2	12	0.84	1.2mg
3	14	0.72	1.4mg
4	16	0.62	1.6mg
5	18	0.56	1.8mg
6	20	0.50	2mg
7	22	0.46	2.2mg
8	24	0.42	2.4mg
9	26	0.38	2.6mg
19	28	0.36	2.8mg
11	30	0.34	3.0mg
12	32	0.32	3.2mg
13	34	0.30	3.4mg

## **General Approach to the Distressed Child**

*A doctor's rapid but composed response to pain or distress will greatly improve parents' confidence and this will be passed on to their child.*

Many children find hospitals terrifying. In addition they need to cope with the stress and pain of injury or illness. Parents are often as distressed as their child – this can start a vicious cycle. In this situation management of the whole family is required! Reassure parents that you are going to help and comfort their child and appear calm and reassuring. Children cry because of pain and fear but they will also cry with exhaustion, hunger and frustration! Nursing staff are experienced in helping you with this situation.

Non-Pharmacological techniques are an important part of caring for ill and injured children. These include:

- Simple comforting
- Distraction
- Relaxation
- Imagery

Pain must be adequately relieved as soon as possible –this may involve analgesia, splinting, topical treatment etc. Prior to undertaking a potentially distressing procedure such as suturing or changing dressings, sedation(anxiolysis) may be required. Guidelines are overleaf.

Remember that ENTONOX (N<sub>2</sub>O/O<sub>2</sub> 50/50) VIA BLUE&WHITE SHOULDERED CYLINDER is invaluable & can be given to babies and children of any age by self-administration or continuously-supervised parental administration as soon as a distressed child arrives. It wears on & off quickly and safely but is contra-indicated in head injury, systemic illness or pneumothorax/ respiratory illness (remove if any sign of drowsiness to prevent excessive sedation).

## **Femoral Nerve Block**

Use levo-bupivocaine (Plain) 0.5%:

AGE	DOSE (MLS)
<5	1ml per year of life
5-12	5mls
>12	10mls

## SEDATION

- *All children requiring sedation **MUST** be discussed with the Consultant.*

Children who are very distressed may benefit from sedation prior to suturing, etc, under local anaesthetic. It is vital that informed consent is obtained from the child's parent prior to giving sedation – some parents will opt to simply comfort their child during the procedure and this is a perfectly acceptable option.

**Remember to ensure there is adequate staff in the department to safely sedate.**

All children will require observation in the Emergency Department for at least 90 minutes after the administration of the sedation and will require close parental supervision for a further two and a half hours at home. After sedation children require careful continuous monitoring of vital signs and SaO<sub>2</sub> by an experienced nurse.

### **Oral Midazolam**

Oral Midazolam syrup can be used to provide anxiolysis without excessive sedation. Dose is 0.5mg/kg.

### **Ketamine**

This should only be performed in the presence of Consultant Staff. The following is the CEM guidelines (due to be revised this year so may change).

#### **Introduction**

Ketamine is a unique dissociative drug introduced into clinical practice in 1970. It has anxiolytic, analgesic, amnesic and dissociative properties with a wide safety margin. It is most commonly used to facilitate short painful procedures, such as suturing under local anaesthetic, removal of a foreign body or brief orthopaedic manipulations.

Before ketamine is used all other options should be fully considered, including analgesia, reassurance, distraction, entonox, intranasal diamorphine, etc.

The doses advised for analgesic sedation are designed to leave the patient capable of protecting their airway. There is a significant risk of a failure of sedation if the procedure is prolonged, and the clinician must recognise that the option of general anaesthesia may be preferred in these circumstances.

Ketamine should be only used by clinicians experienced in its use and capable of managing any complications, particularly airway obstruction, apnoea and laryngospasm. There should be a documentation and audit system in place within a system of clinical governance.

**Indications:** (Evidence Levels 2-3)

Ketamine can be used to induce analgesic sedation in children who will need a painful or frightening procedure during the course of their emergency care. It can be used instead of general anaesthesia for minor and moderate procedures in combination with local anaesthetic techniques.

It avoids the need to physically restrain a child.

Trials suggest over 90% efficacy for parenteral Ketamine.

There is no evidence of improved emergence phenomena if midazolam is used as a supplement. (Evidence level 2)

There is no evidence of reduced airway problems if atropine is used as a supplement with low dose ketamine. (Evidence level 3)

**Contraindications:** (Evidence levels 4 and 5)

- Age less than 12 months due to an increased risk of laryngospasm and airway complications. Children aged between 12 and 24 months should only receive ketamine sedation from expert staff (usually a consultant)
- A high risk of laryngospasm (active respiratory infection, active asthma)
- Unstable or abnormal airway. Tracheal surgery or stenosis.
- Active upper or lower respiratory tract infection
- Proposed procedure within the mouth or pharynx
- Patients with severe psychological problems such as cognitive or motor delay or severe behavioural problems.
- Significant cardiac disease (angina, heart failure, malignant hypertension)
- Recent significant head injury or reduced level of consciousness
- Intracranial hypertension with CSF obstruction.
- Intra-ocular pathology (glaucoma, penetrating injury)
- Previous psychotic illness
- Uncontrolled epilepsy
- Hyperthyroidism or Thyroid medication
- Porphyrin
- Prior adverse reaction to Ketamine

**Procedure:**

1. Discuss the proposed procedure and use of ketamine with parent or guardian and obtain written consent. The known risks are: mild agitation (20%), moderate/severe agitation (1-5%), rash (10%), vomiting (7%), transient clonic movements (5%), airway problems (1%). It is important to emphasise to the consenting adult that nystagmus, purposeless movements and some degree of dissociation are normal during ketamine sedation, so that these are expected.

2. The child should be managed in a high dependency or resuscitation area with immediate access to full resuscitation facilities. Monitoring should include ECG, blood pressure, respiration and pulse oximetry. Supplemental oxygen should be given and suction must be available.

3. At least three staff are required: a doctor to manage the sedation and airway, a

clinician to perform the procedure and an experienced nurse to monitor and support the patient, family and clinical staff. Observations should be regularly taken and recorded.

4. The doctor managing the ketamine sedation and airway should be suitably trained and experienced in ketamine use, with a full range of advanced airway skills.

5. There is no evidence that complications are reduced if the child is fasted, however traditional anaesthetic practice favours a period of fasting prior to any sedative procedure. The fasting state of the child should be considered in relation to the urgency of the procedure, but recent food intake should not be considered as an absolute contraindication to ketamine use.

6. Where time permits, topical anaesthesia (EMLA, Amytop, etc.) should be used to reduce the pain of intravenous cannulation or intramuscular injection.

7. The dose of ketamine is 1.0 mg/kg by slow intravenous injection over at least one minute or 2.5mg/kg IM as a single injection in the lateral aspect of the thigh. The dose should be based on the child's actual weight, not age. Caution and careful checking are required in drawing up the correct dose since there are three different formulations of ketamine available (10mg/l, 50mg/ml and 100mg/ml). A dose chart showing the correct dose and volume to be given according to the child's weight is valuable in preventing errors (see Appendix Two for an example of such a chart).  
Ketamine Sedation of Children in EDs September 2009 - 4 -

8. Encourage the child and parents to talk (dream) about happy topics. This helps minimise unpleasant emergency phenomena

9. Adequate sedation is usually indicated by loss of response to verbal stimuli and nystagmus: heart rate, blood pressure and respiration rate may all increase slightly. Lacrimation or salivation may be observed. The effects of the drug are usually apparent 1-2 minutes after an IV dose, and 5 minutes after an IM dose.

10. Supplemental doses of 0.5mg/kg by slow IV injection or 1mg/kg IM may be given if required.

11. Local anaesthetic should be used where indicated.

12. After the procedure the child should recover in a quiet, observed and monitored area under the continuous observation of a trained member of staff. Recovery should be complete between 60 and 120 minutes, depending on the dose and route used.

13. The child can be safely discharged once they are able to ambulate and Vocalise / converse at pre-sedation levels. An advice sheet should be given to the parent or guardian advising rest and quiet, supervised activity for the remainder of that day. The child should not eat or drink for two hours after discharge because of the risk of nausea and vomiting.

14. The medical record and local audit documentation should be completed.

15. At the end of the procedure ensure that any remaining ketamine is discarded, and that this is witnessed. The empty bottle can then be placed in a sharps bin.

**Potential Complications:** (evidence level 2, 3, 4)

## Airway:

- Noisy breathing is usually due to airway mal-position and occurs at an incidence of <1%. This can normally be corrected by routine airway position management.
- In rare cases laryngospasm may occur (0.3%). The reported incidence of intubation for laryngospasm is 0.02%. A recent meta-analysis showed that low IM doses of ketamine (<3.0 mg/kg) exhibited significantly less overall airway and respiratory adverse events. There were no occurrences of either laryngospasm or apnoea in the 682 children receiving lower IM doses. (Green et al, 2008)

Vomiting: 5 - 10% incidence. This usually occurs during the recovery phase.

Lacrimation and salivation: 10% incidence

Transient rash: 10% incidence

Transient clonic movements: <5%

## **SECTION FOUR – MAJOR INCIDENT PLAN**

This section gives an overview of the department's major incident plan. Doctors are expected to study this during their Induction period and before their major incident tabletop exercise.

Most Emergency Department doctors (including Drs in training) will have an organisational role rather than a clinical one in the early part of an Incident.

It will be too late to start reading the green pages after an incident has been declared!

## MAJOR INCIDENTS

- *“An incident causing so many casualties that additional resources have to be mobilised”.*

In a major incident you will not immediately be able to provide the same level of care that you normally do - by definition resources will be overstretched. For this reason our entire working practice will change and it will aim to produce “the maximum benefit for the maximum number of people”.

### 1. What to do

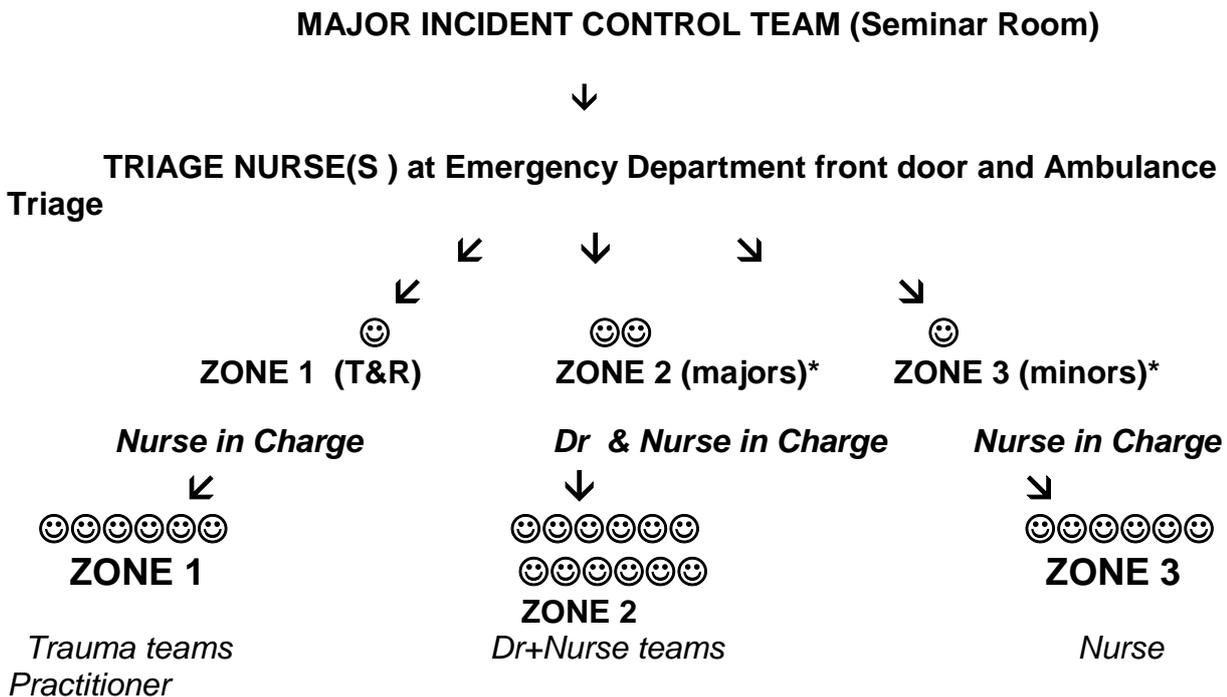
You may be the most senior Emergency Department doctor in the hospital when a major incident happens. It may be the sudden arrival of patients contaminated with dangerous chemicals, patients suspected of exposure to highly infective agents (e.g. anthrax, smallpox), patients who have been contaminated with radioisotopes (often following a transport accident) or, most likely a large number of patients injured in a single incident. All Emergency Department staff on duty must go straight to the major incident cupboard and put on the coloured tabards indicating their roles. The most senior doctor will assume the role of Medical Incident Officer and will allocate the other medical roles- **NOBODY WILL TELL YOU TO DO THIS, YOU MUST TAKE THE INITIATIVE.**

The doctor in charge then helps the Nurse in Charge to set up four areas:

1. TRIAGE POINTS (Ambulance triage and the ED front entrance)
2. RED ZONE / ZONE ONE (Resus): For patients who are in imminent danger of death
3. YELLOW ZONE / ZONE TWO (Majors): For patients who cannot walk
4. GREEN ZONE / ZONE THREE (Minors): For patients who can walk

An overview of this is given below. If you are still in charge after you have set up the areas, distribute copies of the Action Cards from the Major Incident cupboard (or photocopy the Action Cards in this section) and ensure that personnel READ the relevant card. Senior Help should have arrived by now but DO NOT get involved in treating patients yourself until allocated to a decontamination or treatment team by a senior Emergency Department doctor.

## 2. Overview Of Major Incident Response



\* Zone 2 / 3 may be based in Paediatric Area if paediatric patients involved.

## 3. The Three 'Ts' of a Major Incident

**STEP ONE: TRIAGE** (Emergency Department nurses)

- Safety Triage
- Triage Sieve (see next page)

**STEP TWO: TREATMENT** (Emergency Department doctors)

- Arranged in three areas or “zones” according to priority – Pain Relief, ABC: Keep management as simple as possible.

**STEP THREE: TRANSPORT** (Consultants)

- Senior doctors will decide which patient should go where

### **a) STEP ONE : TRIAGE**

*Triage* is our first task in a major incident. It begins with the crude “triage sieve” which assigns patients of similar priority to three different treatment zones (see the NEXT page). The nurses perform triage at the Emergency Department entrance and attach a coloured label indicating a triage category to each patient. A special pack including a *flimsey*, a wrist label, blood forms and bottles, a pen and 10 mg Morphine accompanies each patient (except GREEN) to their treatment zone.

In the unlikely event of a chemical, biological or nuclear incident the nurses will perform safety triage before the triage sieve. Patients who smell of

chemical (unless this is known to be harmless) or who have signs of chemical toxicity (skin/eyes/throat/breathing), or who have suspected biological or radioactive contamination are directed to the cardiac garage area for decontamination with soap and water (including eye irrigation if applicable) before admittance *irrespective of their clinical condition*. Patient advice leaflets about this are available at Reception. PATIENTS WHO HAVE BEEN EXPOSED TO A CHEMICAL BUT WHO HAVE NO CHEMICAL SMELL OR VISIBLE CONTAMINATION DO NOT POSE A RISK TO OTHERS AND DO NOT NEED OUTSIDE DECONTAMINATION.

### Major Incident Triage Sieve

RED (PRIORITY 1): IMMEDIATE DANGER OF DEATH (GCS<9, RESP.> 35, CRT >5)

YELLOW (PRIORITY 2): UNABLE TO WALK

GREEN (PRIORITY 3): CAN WALK

WHITE (PRIORITY 4): NO VITAL SIGNS

RED AREA: ZONE ONE: RESUSCITATION ROOM

YELLOW AREA: ZONE TWO EMERGENCY DEPARTMENT MAJORS  
CUBICLES / PAEDS AREA

GREEN AREA: ZONE THREE: MINORS / PAEDS AREA

WHITE AREA: TEMPORARY MORTUARY IDENTIFIED BY EMERGENCY  
DEPARTMENT SISTER

**\*\*\* EVEN IF PATIENTS HAVE TRIAGE LABELS ON THEY STILL REQUIRE RE-TRIAGE AT THIS POINT\*\*\***

### b) STEP TWO: TREATMENT

Junior and Senior doctors will flock to the ED in a large major incident – this is a recipe for chaos unless the incident is properly co-ordinated by the Emergency Department doctors on duty. You will already have assigned the roles of ‘Doctor in charge’ of the various zones. The Action Cards below will explain the roles in detail. At the beginning of the incident, surgical/theatre teams will automatically go to zone one (resus). They will start resuscitation with no input from you – most of your efforts will be directed to zones two and three. *This is a organisational not a hands-on role – read these Action Cards now*. You are to continue in your role until relieved by a more senior Emergency Department doctor. Doctors from other departments with no Emergency Department experience should go to Zone Two and *they must adhere to their Action Card- read this now*. Doctors who have previously worked in the Emergency Department should generally be directed to Zone Three, as they will have the knowledge required to assess and treat minor injury.

### **3. Action Cards – Major incident Treatment Protocols**

#### **ZONE TWO – DOCTOR IN CHARGE**

YOU ARE IN CHARGE OF THE OVERALL MEDICAL CARE OF ALL PATIENTS IN THIS ZONE UNTIL RELIEVED BY THE EMERGENCY DEPARTMENT MEDICAL INCIDENT OFFICER

- Assist nurse in charge with placement of patients in groups of injury type, i.e., all fractures together, all burns together.
- Give each doctor a handful of venflons, syringes, etc and brief by talking them through a zone two doctor action card.
- Keep a record of patient numbers and injuries on the form provided.
- Walk around the zone ensuring that all patients,
  1. Receive 100% oxygen
  2. Receive morphine 10mg IV unless contraindicated.
  3. Undergo primary survey (ABC).
  4. Are moved to zone one if this changes their priority status (inform AEMIO first).
  5. Receive one unit of haemaccel and one litre of normal saline if signs of blood loss.
  6. Have wounds dressed and fractures splinted.
  7. Have X-ray requirements identified. Have appropriate blood tests taken and sent to laboratory. You must not become involved in hands-on care of patients unless asked to do so by the AEMIO. Be prepared to brief the AEMIO when he/she visits for an update of the progress of the incident in your zone. Other enquiries, etc, (including enquiries from consultant medical staff) should be directed to the AEMIO)

#### **ZONE TWO – DOCTORS**

The doctor in charge of zone two is responsible for all medical care there. You MUST undertake the tasks given to you by him/her and return to him/her when they are complete. You must be economical with resources and time.

##### **ACTIONS**

1. Go round each patient insert a cannula and administer the intravenous morphine which has been placed in the patient's disaster pack. Take blood and sign bottles and form yourself – you must be meticulous about this in a major incident.
2. Assess/stabilise the patient's airway, breathing and circulation. Only carry out essential treatment (e.g., for tension pneumothorax) at this stage.
3. If signs of blood loss give one unit of haemaccel and one litre of normal saline.
4. Dress wounds and splint fractures.
5. Identify X-ray requirements – these MUST be kept to a minimum.
6. Be prepared to brief the doctor in charge of zone two about the X-ray requirements and priorities.
7. Return to doctor in charge of zone two for further tasks.

*You MUST direct all enquiries and problems to the doctor in charge of zone two.*

#### **ZONE ONE – NURSE IN CHARGE**

YOU ARE IN CHARGE OF THE OVERALL NURSING CARE OF PATIENTS IN THIS ZONE UNTIL RELIEVED BY THE ED NURSING INCIDENT OFFICER (AENIO).

Arrange patients according to injury type, i.e., head injuries/chest injuries/burns adjacent to each other if possible.

Ensure that each patient has 100% oxygen applied and receives morphine 10mg IV unless contraindicated.

Ensure that a doctor / nurse team commence resuscitation along ALS lines (primary survey).

Give out medicines and equipment as requested by resuscitation teams.

Keep a record of patient numbers, injuries and triage score on the form provided.

Do not become involved in hands-on care of patients unless asked to do so by the AENIO.

Be prepared to brief the AEMIO or AENIO about:-

Your patient number/severity form.

Requirements for X-ray, transport and specialised equipment.

Other enquiries, etc (including enquiries from consultant medical staff and senior nursing staff) should be directed to the AEMIO/AENIO.

### **ZONE TWO – NURSE IN CHARGE**

YOU ARE IN CHARGE OF THE OVERALL NURSING CARE OF PATIENTS IN THIS ZONE UNTIL RELIEVED BY THE ED NURSING INCIDENT OFFICER (AENIO).

Arrange patients in groups of injury type, i.e., all fractures together, all burns together.

Give each nurse a handful of 100% oxygen masks with reservoir bag and brief them by talking them through a zone two nurse action card.

Keep a record of patient numbers, injuries on the form provided.

Walk around the zone supporting nursing staff and providing any necessary equipment.

*You must not become involved in hands-on care of patients unless asked to do so by the AENIO.*

### **ZONE TWO – NURSES**

The nurse in charge of zone two is responsible for all nursing care there. You MUST undertake the tasks given to you by him/her and return to him/her when they are complete. You must be economical with resources and time.

#### **ACTIONS**

1. Go round each patient and apply 100% oxygen using the face mask with reservoir guard under the trolley.
2. Measure vital signs and record them on the inside of the coloured triage card which is round the patient's neck (replace the card with the yellow side showing)
3. Assist the doctor with management of the ABC.
4. Dress wounds and splint fractures.
5. Be prepared to brief the nurse in charge of zone two about X-ray requirements, equipment and priorities.
6. Return to nurse in charge of zone two for further tasks. You MUST direct all enquiries and problems to the doctor in charge of zone two.



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