# Emergency Department

# Antrim Hospital

# Doctor's Handbook

## August 2019

# 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 on call.

The handbook is divided into four sections:

General Information Section – Blue Pages
Major Incident Section – Green Pages
Adult Clinical Section – White Pages
Paediatric Section- Yellow 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.**

***There is a lot of important information in this section and Emergency Department Doctors need to know it all, so they are expected to study this section in depth during their two week Induction Period.***

## About the Emergency Department

- ***"Senior help and advice is always available."***

The Emergency Department at Antrim Hospital treats just over 90,000 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". Around 75% of patients 'self-refer', 13% come by emergency ambulance and 12% are referred by their GP. The main purpose of the Emergency Department service is to treat major trauma, minor trauma and all sorts of 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, four staff grades, six ST4+ and twelve doctors in training…. *SENIOR HELP AND ADVICE IS ALWAYS AVAILABLE*.

The department has three 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. 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 each day.

## Working in 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*** **- unfortunately this means dressing professionally -hospital "scrubs". Be sure to 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.**

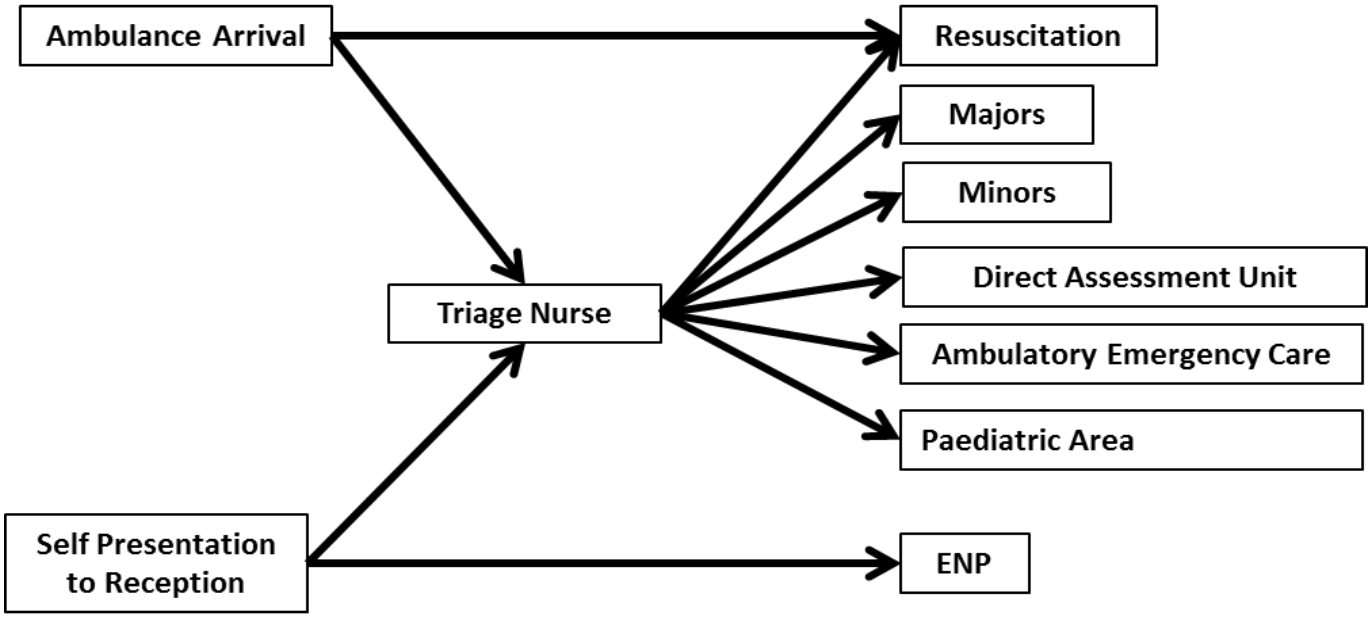
- **Students must never *treat* children (e.g. by suturing, taking blood etc)**

- **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 aliments**

## 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 - there can be no weak links in the chain.

**THE STREAMS ARE:**

1. **RESUSCITATION (Incorporating Adult and Children's Resuscitation)**
2. **ADULT MAJORS**
3. **PAEDIATRICS**
4. **MINORS**
5. **AMBULATORY EMERGENCY CARE**

Allocation to the streaming system operates as follows:-

- All non-walking patients (ie, 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 – eg "abdominal pain", "ankle injury". During the registration process, patients are invited to self-select to the *Minors Direct Service* by receptionists who will explain that the "Minors Direct" option is open to any patient with any minor condition except a head injury. Such patients then join a queue to be seen in order of arrival* and are <u>not</u> assessed by the Triage nurse. All other walk-in patients, including those who are unsure if they are eligible for "Minors Direct" are assessed by the Triage Nurse.

## 2. <u>Triage</u>

In practice, the main purpose of *triage* is to allocate walk-in patients (who have not already self-triaged to minors) to a treatment location:

After a brief assessment, the triage nurse direct appropriate patients back to the waiting room to join the queue for minor treatment.

i. If a patient of any age is *acutely unwell* the triage nurse escorts him/her into majors or resuscitation area and notifies staff there.

ii. *Stable paediatric patients* (16 and under) excluding those with minor injury, are directed through to the Paediatric area.

iii. *Stable adult patients* with non-minor conditions undergo basic observations eg, vital sign measurement, urinalysis and the "WEAD+" before being directed to the Waiting Room. From there a member of the Major's nursing staff calls them into their area in order of arrival.

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 - 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 requiring ongoing resuscitation will remain in Resuscitation, other patients move on to be treated in the "Majors" area of the department.***
- ***In majors, patients will generally be seen in order of arrival unless nursing staff inform you of patients requiring priority***

*Adult Majors:* Following their assessment in Majors, the vast majority of patients will require to be seen again in Majors to allow decisions to be made about disposal and treatment. Many will have undergone laboratory/point of care testing and most will go to the Radiology Department for x-ray, ultrasound or CT examination. Ambulant patients should walk to x-ray, guided by the floor signs. For non-ambulant patients, wheelchairs should be used if possible thus keeping trolley-movement to a minimum. After x-ray patients will return to the Adult Majors area (ambulant patients will report to majors reception where they will directed to the seating area. A detailed review of the patient taking into account x-rays and results will be undertaken by the doctor who initially saw the patient. When the decision-making process is complete, patients will be admitted to a ward or discharged for ongoing treatment in the community (see admissions policy below). 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*: Unless seriously ill, children will be directed to the paediatric area accompanied by their parents. Paediatric Majors is generally suitable for children aged 16 and under. 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. (see admissions policy below).

## 4. Senior Sign off

Groups such as Under 1 with a temp, >18yr olds with non-traumatic chest pain and Unplanned re-attenders 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 and use of the Observation Ward.

*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 emergency department doctor decides to admit, the patient flow co-ordinator is notified via the electronic tracking screen and the doctor notifies the appropriate doctor on the take-in team of the patient's condition. For medical admissions, the Medical SHO on-call, bleep 5149, should be contacted. ("Vetting" of admissions by take-in teams is not permitted – any concerns they have about the appropriateness of admission can be passed on to the senior emergency physician on duty who should re-evaluate the patient.)

*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 eg 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:* The first task of the emergency clinician is to exclude an organic cause for mental symptoms, so patients presenting with a mental health symptom are evaluated. Disturbed patients should be sedated promptly and effectively if appropriate by the most experienced doctor on duty. See CLINICAL section. Patients with an organic cause of their psychosis should be admitted under the medical team. Patients with self harm should be treated appropriately according to TOXBASE and / or have proper wound management. Patients requiring Mental Health Assessment by the MHLS team should be referred at triage or as soon as possible therefore. They may be admitted to the Observation Ward (on a proforma) if there is a requirement for a washout period of drugs/ alcohol or medical treatment is required.

## 6. Care of Minors

*Whenever possible, minors patients will be seen in order of arrival twenty-four hours a day*

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 (not requiring procedural sedation) will be carried out in the Procedure Room.

## 7. 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* 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. This live tracking data is displayed in each treatment area and in reception. This will allow patients to be located accurately at all times, moreover staff will be alerted to the number of patients waiting for their treatment area and senior nursing and clinical staff in the department will be able to monitor the flow of patients overall. 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.

***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. Being "too busy" is NEVER an acceptable excuse in a modern ED!!***

Wherever possible patient enquiries from relatives (either via external phone or internally via reception) should dealt with by the liaison officer who will confirm the patient's location in the department via the tracking screen. A member of nursing or medical staff will only be consulted for information about seriously ill patients or those whose assessment in majors is complete (see telephony policy).

## 8. Patient records

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 eg 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.

## 9. Care of friends and relatives

With the exception of parents, or those who care for disabled or vulnerable adults, relatives should be limited to one per patient at any time during their journey through any part of the Emergency Department. They should be invited to remain in the waiting room and should be reunited with the patient only when assessment and initial treatment are complete. Relatives of gravely ill or distressed patients should be escorted to the relatives room by a senior nurse or doctor. ALL staff are asked to help the department by preventing unauthorised people from coming through controlled-access doors and by politely escorting wandering relatives to the main waiting room

Friend or relative enquiries about a patient's progress through the department can be answered by the majors phone desk via the main receptionist.

## 10. Night Time

3 Doctors will work overnight; one senior and 2 more 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. The phone desk may be switched off, diverting calls to all extensions. Doctors on night shift should not leave the department.

## 11. 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 who are 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.

## 12. 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 as a junior doctor. You will also be allocated a middle grade or consultant member of staff to work with you. 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 at the start of a patient's journey. This most commonly means after history and examination you explain your plan to your "buddy" for the day. There will always be a named consultant for an area. If you have any concerns it is your duty to report to this consultant.

Consultants will conduct ward rounds at 8am afternoon and 10pm. The consultant and senior nurse will review all the patients in the department. This is to aid in decision making and it is recognised as good practice by our College. Decisions should not be left to this stage. It is merely a process to make sure the correct decisions have already been made.

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 as many patients as possible 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.

# "THE FOUR-HOUR TARGET"

- ***Patients should have their DADT screen completed within* 3 h 00 m *of registration***
- ***Patients in Majors or Minors must be seen in order of 'Time in department'***

***Each doctor and ENP's individual performance will be audited continuously via the Symphony computer system (patients seen per hour and 3hr 00min DADT breaches). Doctors who cannot learn to treat patients SAFELY, EFFECTIVELY and PROMPTLY will not be able to progress in the specialty of Emergency Medicine and may be given restricted clinical allocations***

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. Inexperienced doctors must study the clinical section of this book to gain the knowledge required to assess patients promptly.

## 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**
- **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 Area 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 90minutes 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 – 'what is the problem and what should be done now?'

***"There is more to treating the patient than treating his disease"***

**Sir William Osler**
**The famous Canadian physician**

This is certainly true in Emergency Department! In most cases, an accurate and *full* 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+'**
- **What is the history?**
- **Directed Physical Examination**
- **Directed Investigations**
- **Final placement**

## Why was this patient referred?

1. **Information from the "Source of referral"**
2. **Information from Next of Kin**
3. **Information from Previous Attendances and Admissions**

### 1. 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 DAU?**
- **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 reattending 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.**

## 2. Information from Next of Kin

- ***"Don't forget relatives! "***

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).

## *3.* 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 checking all old records for children under 16/vulnerable adults and two years' records for adults* (this is the Emergency Department receptionists' responsibility). 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.

# Record Risk Factors – 'WEAD+'

***.."it takes sixty seconds!.."***

WEAD+ stands for Warfarin/NOACs / 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.

## History

***"I told the doctor in Casualty what was wrong several times but he just ignored me…"***

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..*"**

## 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.

## 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, 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.

**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, $PO_2$, $PCO_2$ 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" and any clinically important results on the patient's flimsey (eg 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 routine admission bloods,* they are the 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.

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

| | |
|---|---|
| **ABDOMINAL PAIN**<br>FBP U&E<br>LFT Amylase<br>CRP Urinalysis<br>HCG Erect CXR<br>AXR | **CHEST PAIN** Cardiac sounding<br>U&E Chest x-ray<br>FBP Troponin<br>ECG 1 ECG 2 |
| **COLLAPSE ?SEIZURE**<br>U&E Glucose<br>LFTs Mg<br>Ca FBP<br>Drug levels of antiepileptics ECG<br>Urine & HCG Chest x-ray | **GI BLEED**<br>FBP U&E<br>Coag LFT<br>INR G&H<br>BM ECG<br>Chest x-ray |
| **HEADACHE**<br>a. Thunder Clap headache<br>New abnormal findings or new } CT<br>b.With none of the above<br>>55 years of age - ESR<br>Obs<br>FAST<br>Warfarin | **NON-SPECIFIC CHEST PAIN**<br>ECG<br>Chest x-ray |
| **PALPITATIONS**<br>ECG | **PV BLEEDING**<br>Urine HCG (12-55) Obs |
| **RULE OUT PE**<br>FBP U&E<br>CRP D-dimer<br>PERC score Wells score<br>ECG CXR | **SOB**<br>FBP U&E<br>CRP Sats<br>ABG if sats <92 ECG<br>Peak Flow CXR |
| **STROKE/TIA**<br>FBP U&E<br>BM ECG<br>INR<br>(Cholesterol – supplemental test) | **SYNCOPE**<br>U&E/Glucose FBP/CRP<br>Elderly – Troponin ECG<br>CXR Urine<br>Lying/Standing BP |
| **UNWELL ELDERLY**<br>FBP U&E<br>Troponin CRP<br>LFT ECG<br>CXR Urine | |

## X-rays

Studies of different departments have shown a variation in x-ray rate from 26-80%. Our target is 45% -i.e. just under half of your patients. You should be able to access the RCR guidelines "Making the best use of an Imaging Department" on line or you can ask the radiology department for a booklet. (Try http://www.rcr.ac.uk/index.asp?PageID=957) Read the sections on Trauma and on Children's x-rays until you are familiar with them – they are really helpful!
You will be given access to the x-ray department's PACs system so that you can view the images you requested on screen – and also the previous ten days x-rays.

*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.*

### These are the 6 commonest types of *unnecessary* x-ray in this department:

1. ***Chest*: patients with COPD, asthma etc. don't need an x-ray every time. Use your clinical judgement about this. Patients with suspected rib fracture due to low impact trauma who have equal air entry do not require an x-ray. Children with known asthma do not require an x-ray**
2. ***Abdomen:* abdominal x-rays are required if there are clinical grounds to suspect intestinal obstruction/ intussusception (supine film only), perforation (erect chest x-ray) or renal stones( 'KUB'), although all adults who require surgical admission for abdominal pain should have a straight x-ray abdomen with erect chest.**
3. ***Skull* : Indicated only for detection of FB in wounds or suspected NAI in children**
4. ***Spine (cervical or lumbar):* See CLINICAL Section for a back pain management algorithm. Don't x-ray for non-traumatic neck or back pain present for less than *six weeks* unless you suspect vertebral collapse. Patients under fifty years old rarely need x-ray lumbar spine for back pain. In over fifties check ESR and perform general examination as well.**
5. ***Ankle* & *Knee:* We use the Ottawa Ankle and Knee rules. See CLINICAL SECTION**

### General Guidance on X-rays and the Emergency Department

- **Women aged 15-50 should not have x-ray of the abdomen, pelvis or lumbar spine except within ten days of their last period unless they provide written confirmation to the radiographer that there is *no possibility* of pregnancy (i.e. not sexually active, sterilisation etc). *Negative urine or serum HCG tests do not exclude early pregnancy.* If you consider x-ray absolutely essential, (i.e. trauma) explain this to the patient & obtain her consent. You can then tell the radiographer that you are overriding the 10-day rule on clinical grounds.**

- **Doctors are often sued for failing to x-ray patients who subsequently turn out to have a fracture - *if a patient has been recently injured, any tender bones must be x-rayed. This is particularly important if the patient has a history of osteoporosis.***

- **The radiographers are generally very experienced and they can often advise you about which views to request etc.**

- **The final responsibility for irradiating the patient rests with the Radiographer. If a radiographer refuses to do an x-ray that you have requested, you must explain the indications for the x-ray to them in person. If this does not resolve the situation, speak to a radiologist (make written of record conversation) or notify the Emergency Department consultant or ST4+ on duty immediately.**

- **You will have access to all the Radiologists' old reports on the Emergency Department PACS system or radiographers' computer - this is invaluable. Don't hesitate to look at or ask for old films as well – a lot of abnormalities, especially on chest x-rays, are long-standing.**

# Final Placement (Part 1): Discharging and arranging follow-up

- ***"your management plan is at least as important as your history and examination – equal care should be taken with devising and recording it"***

'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 and by 'x'-ing the final placement column at the bottom of the flimsy AND on SYMPHONY.

***This section covers:***
**Discharge Planning**
**Reviewing Patients at the Emergency Department**
**Direct Access to outpatients**
**Handing Back to GPs**
**Prescribing in the Emergency Department**

**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. This system prevents large numbers of unneeded clinical reviews and it works extremely well. Tell patients that

they can re-attend or phone between 9 am-12 mid-day, Monday-Friday unless they have to come back urgently. Explain that a consultant or another senior colleague should be available to see them at that time.

**Discharging Safely**

*Don't forget to check that your patient will receive adequate help after discharge.* Patients (excluding those with minor complaints) 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 there. Try to mobilise support from the family or friends for the person living alone. If the patient insists on going home alone they should be given our telephone number and 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.

**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, REPEAT 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 unfinished flimsy on the consultants' desk in the computer room with an explanatory note - a decision will be made regarding follow up on the next "working" morning. 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. The Consultant or their secretary will then contact the patient the next working day.

The Emergency Department clinic arrangements are complicated and reception staff are not telepathic- use the information below to ensure that you have specified the correct review clinic properly. You must write ED Review Clinic (RC), DVT clinic, Injury review clinic or Fracture Clinic on the notes and on the appointment card that you give to the patient and send the patient to the Reception desk to make this appointment.

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

***Emergency Department Review Clinic***
**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**
**? Toddler's fractures and other query # in children (negative x-rays)**
***Complicated* wounds, burns etc (exclude treatment room cases)**
**Compound fractures & other cases require immediate referral to RVH FC**

## Direct Access to Outpatients

- **Early Pregnancy Assessment Clinic - speak to Midwives (EXT 4135 ) or Gynae SHO**
- **ENT FOR NASAL FRACTURES ONLY - write "#NB review 5-7 days" clearly at the bottom of the flimsy. Fill out an appointment card and send the patient to reception.**
- **Fracture Clinics refer all definite fractures for fracture clinic f/u (held in Whiteabbey Hospital)**

## Handing back to GPs

***" 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 the range of "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.

## Prescribing in the Emergency Department

- **"*Generic prescribing please!"***

**1.** You can *dispense* 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). Dispensing should only be used out-of-hours or if the patient is unable to get to their pharmacist. Drugs such as diazepam should not be dispensed unless in exceptional circumstances.

**2.** You can *write a hospital prescription* for the drug. Computerised prescribing via Symphony is possible, so that the GP is aware which drugs have been given or recommended. In the letter to the GP. Recommend the name, dose and frequency of administration of the drug as well as the duration of the course of treatment. This information will appear on the discharge letter sent to the GP. Commonly used analgesics are paracetamol, ibuprofen and diclofenac. *Addictive drugs such as "Tylex","Kapake"and the benzodiazepines should be prescribed with care and for short duration with advice for early GP review with a view to decrease dosage*.

**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**

## Final Placement (Part 2 Assessing and treating patients who may require admission

***This section covers:***
**Pre-Admission Assessment**
**The Modified Appropriateness Evaluation Protocol (Modified AEP)**
**Emergency Care in the Community**
**Emergency (Non-Nursing) Care in the Community**
**Home IV therapy**
**MHLS**
**Running out of beds**
**Patients who require admission to the wards**
**Transferring to other hospitals**
**Call and Send**

### a) Pre-admission assessment (NB 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).***

The number of acute hospital beds has decreased dramatically over the years because of government policy. The result of this is massive pressure on bed availability both for emergencies and for elective surgery. Pre-admission assessment can assist by diverting patients who do not require an emergency acute bed and it is one of the main roles of this department. The purpose of this system is to ensure that patients are not admitted unless this is clinically indicated, that they are referred to the correct specialty and that immediate resuscitation is carried out if necessary.

In general, you are expected to decide whether or not a patient requires admission to the wards without consulting the inpatient medical staff – the decision to admit or discharge from Emergency Department is our responsibility, often in accordance with protocols given in the CLINICAL section. This decision is not always as easy as it sounds – some patients and their GPs have unrealistic expectations and you can be put under a great deal of pressure. You must make a very careful assessment of the situation, taking both patient's and GP's wishes into account. If you are inexperienced you must remember your limitations. When in doubt you should go through the case with a more senior Emergency Department doctor.If a GP phones to request admission, discuss the case with a consultant, or advise them to contact the AMAA if the problem is medical. Discharging the patient is your responsibility. You cannot avoid the issue by referring the patient to the in-patient team to let them decide for you- bad advice is bad advice regardless of who gives it.

More and more frequently patients in the pre-admission category are referred for "RULE OUT" investigations that can be only accessed urgently by Emergency Department staff rather than for

admission. The CLINICAL section contains information about our structured approach to this for many common presentations –you need to know this information, referring to the Handbook regularly.

If you decide that your patient requires admission, ask yourself 'why?' – Is this definitely the most appropriate option for them? Please discuss all admissions with a senior doctor in your first few months.

**b) <u>The Modified Appropriateness Evaluation Protocol</u>**

**c)**

The thought process described above is now to be formalised and each doctor's performance will audited continuously using the Modified AEP- a utilization management tool that is to be embedded in the Symphony admissions process. *Doctors who cannot learn to admit appropriately will loose the right to admit and may have restricted clinical allocations*. There are occasions when a patient should be admitted despite a lack of indications on AEP – this is a Consultant case (No 14 in box below)

***At least ONE of the following***

1. **Unstable angina OR ECG or cardiac marker evidence of acute ischaemia[1]**
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[2]**
4. **Will require any form of new artificial ventilation or supplemental oxygen[3]**
5. **Severe electrolyte/acid base abnormality[4]**
6. **Likely to require a procedure in theatre within 18 hours[5]**
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[6]**
13. **Acute rupture of recent surgical wound**
14. **Consultant Protocol-override authorised by Dr_____**

**Note**

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.

### d) Emergency Care in the Community

THERE ARE SOME EXCELLENT SERVICES IN THE COMMUNITY–PLEASE USE THEM AS MUCH AS POSSIBLE.
A team of community nurses, physiotherapists and occupational therapists are attached to our Emergency Department. Their job is to help co-ordinate discharge and follow-up for our Emergency Department patients within the community, avoiding hospital admission for those who require nursing / physio / OT rather than hospital-based care. They are able to care for patients in specially funded short term nursing home beds, carry out home visits including iv therapy (see below) or follow up on the telephone. They work closely with the social services team (see below). A nursing member of 'ACAHT' is available 9am-11pm seven days per week with full bank holiday cover *(mobile 07979693195).* Outside these hours fax a referral form to Dalriada Urgent Care ( *fax to 08705329024*). A member of the Rapid Response Team (social services) providing short term non-nursing assistance to patients in their homes can be contacted daily between 9am and 9pm (*mobile 07960531626*). To date the physio/OT teams work during office hours only. An emergency social worker can be contacted out-of-hours via *94468833*. The local out-of-hours GP service is Dalriada Urgent Care on *08705329024*.

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) Emergency (Non-Nursing) Care in the Community (Social Worker: Extension 4642)

An emergency CARE PACKAGE may be required because of intercurrent illness or injury or a change in social circumstances - anything which removes an elderly or dependant person's ability to care for him/herself. The package may include home helps, meals, emergency hostel accommodation or residential care. Contact our social worker or, after hours contact the social worker on 94468833. There are two important considerations - Firstly, make sure that there is nothing "medically" wrong eg. x-ray hips and pelvis, check ECG, check u&e / WCC. Request an ACAHT assessment of mobility and nursing needs before making the referral or carry out one yourself if this is not available ( see CLINICAL SECTION on Falls). Secondly, 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 be aware of it).

### f) Home IV Therapy – Hospital Diversion

ACAHT can be asked to give IV antibiotics at home for selected patients requiring IV therapy who are not ill enough to require hospitalisation. The ACAHT 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), ACAHT referral form (on symphony) and a copy of the patient's notes – the ACAHT nurse will explain this to you if you are unsure. These patients remain under the care of Emergency Department and in practice almost all are on antibiotics for severe or non-responding cellulitis. 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) and ask the ACAHT nurse to monitor progress.

### g) Mental Health Liaison Service

Strictly speaking, these services should not be included in this section as they provide emergency assessment and care for mental health problems rather than for conditions requiring admission to a general hospital. In practice however, Emergency Department patients with mental health problems have often been stranded in Antrim hospital because of delays in accessing psychiatry services and ED doctors have acted incorrectly in the past by admitting patients who are medically fit for discharge on the advice of mental health team personnel. There is more information about this in the CLINICAL SECTION.

### h) "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.

### i) Patients who require admission to the wards

Complete the Final Placement column on the flimsy and the Symphony Screen, advise patients *and their relatives* of your decision to admit and brief the admitting relevant doctor about the patient's diagnosis and condition. Take special care to ensure that diabetic patients receive meals or sliding scale insulin/glucose infusion as appropriate and that regular medication is not "accidentally" omitted.

## The following general guidelines apply for care pending admission.

- **Cardiac patients: bed rest, continuous ECG, SaO2 monitoring, controlled O2 therapy (default =100% NRRM), iv cannula, minimum two-hourly obs, relevant blood tests, CXR and regular medication (see clinical section)**
- **Surgical Patients: bed rest, fasting, iv fluids, daily fluid chart, parenteral analgesia as required, relevant x-rays and blood tests, minimum two-hourly obs, medical reassessment every six hours**
- **Medical patients: controlled O2 therapy (default = 28%), iv cannula, SaO2 monitoring, relevant blood tests, x-rays, regular medication, daily fluid chart, minimum two-hourly obs, supervision for patients at risk of self harm**
- **Patients awaiting any inpatient care who also have diabetes (ie non-coma).: U&E, FBP, ECG, Minimum 2-hourly BM, IF fasting, sliding scale insulin and glucose infusion.**

## j) 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). Rarely, patients will require transfer to another hospital because of lack of beds here.

## k) Call and Send

Trauma patients – Clinical information section

**Never transfer ill patients, for example those with unresolved chest pain, severe asthma or impaired consciousness unless a properly trained and equipped doctor accompanies them. If there is no one available to transfer such patients - speak to one of the Emergency Department consultants or StR. You cannot leave the Emergency Department. An anaesthetist should transfer patients who may require airway management or ventilator support. Ill children should be generally be transferred by paediatricians or paediatric anaesthetists. NICATS (the RVH ICU-based anaesthetic transfer service usually collects stabilised patients *from ICU* who are going to RICU and is rarely appropriate for ED transfers). *ALL PAEDIATRIC TRANSFERS MUST BE EXAMINED BY / DISCUSSED WITH THE ED CONSULTANT/ SpR and PAEDIATRIC REGISTRAR. The bed to be arranged by the PAEDIATRIC REGISTRAR.***

## Emergency Department Observation Ward

### *There must be a single focused goal for the patient's care.*

***("To get better" is not one!!!)***

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.

**The key principles governing the unit are:**

- **It functions as an *integral* part of the Emergency Department**
- **There is careful patient *selection* by ED doctors**
- **The admitting doctor identifies a *single focused goal* for the patient's care**
- **There is frequent *monitoring and re-evaluation* by SSW nurses and doctors**
- **There is rapid access to *diagnostic* tests**
- **There is rapid access to *psychiatric* assessment**
- **There is rapid access to multi-professional assessment for *community care***
- **There is open access to *inpatient services***
- **The length of stay is limited to *24 hours***

***Admission Criteria***

There are set criteria and proformas for admission to the Obs 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.
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:

- **There must be a single focused goal for the patient's stay in the Obs ward.**
- **The goal must be achievable within 24 hours**
- **The patient must not have any grossly abnormal vital signs following therapy in ED (ie GCS<12, P<50 or >110/min, SaO2<94, BP<90 systolic, CRT> 3secs) – record vitals before admission**
- **The patient must not have complex medical problems (usually only one organ-system involved) or have multiple medical problems (elderly patients tend to have these).**

***Specific Exclusion Criteria***

Patients with the following conditions must not be admitted to the SSW without the ED consultant's permission:

- Low back pain (unless due to acute extrinsic injury)
- Post-Chemotherapy complications

***Admission Procedure***

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

- Tell the patient and relatives or carers that he or she will be kept in the Short Stay 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 Obs 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 Obs ward

***Medical Re-assessment***

It is essential that patients' progress in the OBs 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)
There can be no OBSERVATION WARD OUTLIERS if no bed is available refer on to medical/ surgical team.

***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. Patients in cardiac arrest due to VF/VT should be defibrillated immediately. 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).

**MHLS (Mental Health Liaison Service) and CAHMS service**

The northern trust is unique in offering an adult psychiatric review service from the point of triage and providing first assessment for all patients regardless of age and learning ability. There is a CAHMS service until 10pm and after this RAID will also provide a first assessment for 16-18yr olds
In some cases when mental status is clouded by drugs or alcohol it may be appropriate to admit to the observation ward for a short period.

## 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.

***Examples of Conditions appropriate for the SSW***

| | |
|---|---|
| **I. Diagnostic Evaluation** | **Head Injury – fulfilling criteria for admission without scan** |
| | **DVT & PE (see clinical section)** |
| | **Chest Pain – see CLINICAL section** |
| | **Chest Injury –normal initial examination, ECG and CXR** |
| | **Abdominal Injury –normal initial examination and CXR** |
| | **Non-Specific Abdominal Pain *(under 50 years)*** |
| | **Drug Overdose – Clinically stable** |
| | **Anaphylactic Reaction – after responding to 1st dose of adrenaline** |
| | |
| | |
| **II. Short Term Treatment** | **Pain Control (eg severe renal colic, headache, rib fracture)** |
| | |
| | **Selected Infections –including pyelonephritis, severe cellulitis** |
| | **Seizure Disorder – including first seizure but not status** |
| | **Primary Spontaneous Pneumothorax –after aspiration** |
| **III. Psycho-social needs** | **Self Harm** |
| | |
| **IV. Recovery** | **Recovery from procedural sedation** |

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

RULE OF THUMB
If more than three lines are written on the white board in SSW, they probably were not suitable as a SSW patient.

## Healthcare Associated Infections

# *"Never Do Harm To Anyone"*

***Hippocrates 4th Century BC***

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 HACI vary from 15-30 % but experts say that ALL cases are avoidable.

HCAI include

- Staph Aureus /MRSA
- C Difficle 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 HYGEINE**
**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**

# Communication

The General Medical Council has emphasised that doctors have a responsibility to communicate properly with patients and with other doctors. This department prides itself on good communication.

***This section covers***

**Clinical Notes**
**Contacting GPs**
**Referring patients to other hospitals**
**Handing over patients to ward doctors**
**Taking telephone enquiries**
**Mobile phone calls from ambulance crews**
**(use of computerised records are described in the Symphony handbook)**

## Clinical Notes

- ***"your writing must be legible!"***

***Record:***

- ***your name/initials in block capitals***
- ***diagnosis or main presenting symptom in***
- ***a Final Placement option***
- ***Ensure that Symphony entry is maintained***

The nature of ED work makes careful thorough documentation essential. Your notes will be read by the Emergency Department consultants who check them daily, the radiologist who reports on your x-rays, the patient's GP and, when applicable, by the doctors on the ward - *your writing must be legible!* Other clinicians must be able to work out what you did with the patient, what you said to the patient and what arrangements you made for follow-up. GPs get a computer generated letter based on the data you have entered. Medico-legal considerations mean that you must record what you say and do to every patient. The busier you are and the more tempted you are not to complete a patient's notes, the less likely you are to remember that patient when the inevitable problems arise. Don't forget that, since the FOI Act 2000 patients have a right to read their notes and frequently request copies from the Medical Records department.

If you have referred the patient to another specialty (eg gynae) YOU must still fill in the final diagnosis before the patient is discharged and YOU must do all the computer work.

## Contacting GPs

It is a good idea to speak to a GP on the telephone when you decide to discharge a patient he/she has asked you to admit (if the GP vehemently opposes this plan speak to a consultant!). You will soon get to know the good GPs and it is wise to follow their suggestions, they know their patients better than we do. They can also be very helpful if you are having difficulty with a patient or if you need more information. Never ring a GP to complain or write adverse comments about GPs on the flimsy - please speak to a senior ED doctor first on every occasion.

## Referring patients to other hospitals

Advice about referring specific cases can be found in the CLINICAL section but there are some general points that apply to all situations. You must obtain the NAME of any doctor who advises you about a patient and this must be recorded on our flimsy along with the advice given. Some people find this embarrassing - don't be shy, just say "could you spell your name for our records"

When you transfer a patient elsewhere make sure that you send a photocopy of the notes, results, *and an accompanying pre-formatted transfer letter*. You must ask staff to scan all the paperwork before it leaves the department.

**Handing over patients to ward doctors**

It is good medical practice to ensure that you have safely handed a patient over to the next doctor who will be involved in their care. Please ensure that you speak to the relevant take-in doctor about any patient who you are admitting giving them key hand-over points regarding diagnosis, progress and treatment. The SBAR method is gaining wide acceptance- please use this format.

***Safer Patient Initiative***

| | | |
|---|---|---|
| S | ituation<br>What is going on now? | ▪ State your name and Ward / Department<br>▪ I am calling about patient's name<br>▪ The reason I am calling is .....<br>▪ Observations are |
| B | ackground<br>What has happened? | ▪ State the admission diagnosis and date of admission<br>▪ Relevant medical history<br>▪ A brief summary of treatment |
| A | ssessment<br>What you found / think is going on | ▪ State your assessment of the patient<br>▪ Have appropriate documents available, e.g. EWS, nursing and medical records, resus status, allergies etc |
| R | ecommendation<br>What you want to happen | ▪ I would like (state what you would like to see done)<br>▪ Determine timescale, e.g. NOW!<br>▪ Is there anything I should do?<br>▪ Other referrals? e.g. Acute Care Team |

**Do not forget to document the call**

***Take in doctors from the wards should not regard the hand-over contact as a request for advice about whether or not to admit the patient. The only doctors who are in a position to discharge patients in these circumstances are middle grade staff or consultants and they should be asked to examine the patient and make a record in the EMERGENCY DEPARTMENT notes. This is hospital policy*** **– the days of lengthy repeat assessments in EDs are officially over.**

## Handing over patients to other ED doctors

This is a danger zone – it is difficult to take over a patient for someone without starting from 'scratch' and mistakes are common. The best way to avoid this situation in majors is to stop seeing new patients 15-20 mins before going off duty if this is possible. If you must leave patients for another doctor, give him/her a run down of whom you are leaving and what still needs to be done. Document in the notes the Dr who you have handed the case over to. You will have to ensure that the tracking screen is updated with your details for the handed over patient - – make sure that you log on and off Symphony or you will be held responsible for
something someone else has or hasn't done. You must record which of your colleagues is taking over the care of the patient on Symphony.

## Taking enquiries and speaking to patients on the phone

The Emergency Department has a dedicated telephone helpline for ex-patients and the general public. The helpline phone is in the computer room and when it rings it should be answered as soon as possible by one of the Emergency Department medical or nursing staff. When you give medical advice over the phone you have the same "duty of care" that you have when the patient is in Emergency Department, no matter how trivial or casual the enquiry seems to be. Dealing with callers can be especially demanding - there are almost as many problems with telephone interactions as there are with incidents actually taking place within the department, so be very careful! There is a departmental protocol for the helpline, you must adhere to this.

***All telephone conversations with the public or with healthcare professionals about medical subjects must be recorded in writing* – special record sheets are provided in a file beside the helpline telephone.**

If you have spoken to a patient who has already attended, you *must* report the conversation in the patient's notes or append a copy of your completed telephone enquiry form. This includes giving results, recalling, receiving complaints etc.

If you advise patients to telephone the department for results etc, make sure that you have told somebody to expect the call before you go off duty and that you have recorded all the relevant information in the patient's notes.

## Mobile phone calls from ambulance crews

All calls from ambulance crews requesting advice or on scene assistance must be directed to the middle grade doctor or consultant on call without delay. If necessary, arrange for the consultant on call to phone the crew back. Doctors in training should not advise about pre-hospital care or triage under any circumstances.

## Arguments 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. *Listen to people - we aren't always right!* 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 name of their Emergency Department consultant and the name of 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.**

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

## SECURITY CHECKLIST

**Your safety is paramount. Be aware for potential problem patients.**

**Danger conditions**
Known aggressive patient or parent
Hx of aggressive behaviour from NIAS / PSNI
Alcohol, substance abuse
Psychosis / personality disorder

**Danger signals**
Agitation
Confrontational
Gesturing

**Actions**
1. Identify problem patients early
2. Take patient into visible open cubicle
3. Inform nurses of plan
4. Make security aware
5. Ensure own safety within cubicle
6. Chaperone
7. Try to defuse situation or use more experienced staff

**If escalation of violence occurs**
Ensure own safety and that of staffs
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.

***This section covers***

**Chaperones**
**The Coroner**
**The Police**
**Consent**
**Court**

## a) Chaperones

Male doctors will be familiar with the importance of obtaining informed consent and a chaperone prior to performing intimate examinations on female patients. This principle should extended to all such examinations *irrespective of the age & gender of the patient and doctor.* 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.

**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.* He should be informed about any death due to injury and any death when neither the Emergency Department doctor nor the patient's GP can issue a death certificate. This is your responsibility – no one else can do it for you, so you must not go off duty until it is done. Out-of-hours you can leave a message on his answer-phone including your name and personal contact details. You should try to speak to the patient's GP on the phone at the earliest opportunity after any death in Emergency Department. If problematic discuss with the on-call consultant. *A pro-forma is to be filled out and left in the Emergency Department Consultant on call's office. If the patient has died in the department, a clinical summary will often be required for the pathologist- it is best to write this*

*at the same time as doing the proforma and leave them together. Death certification should be done on NIECR only one copy of the death certificate should be signed.*
Relatives' consent is not required for a Coroner's PM but if they indicate that they are distressed/unwilling for this please notify the consultant on call. If you think that a hospital PM is indicated in non-coroner's cases notify the consultant on call. 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.

**c) 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" ie "Dear Sir" or "Dear Sir or Madam" and "yours faithfully" are the correct forms for this letter
Coroner's proformas should be completed on NIECR and a copy also filed in the notes as well as forwarded to the coroner.
Statements for the Coroner (ie 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.

**d) The Police**

Police officers will frequently request statements from you, eg after RTAs and alleged assaults. You can go ahead and provide these provided 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.

## e) Consent

Written consent must be obtained before any procedure such as reduction, fb removal, incision & drainage. Fingertip surgery using the Hospital's consent forms available on symphony (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 Northern Ireland***

**(i) 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.**

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.

When using the symphony generated consent forms, you must photocopy and give a copy to the patient.

## f) Court

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!! If you are unsure what to do discuss it with a senior doctor. 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.

1) 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, eg, ordering tests, referring patients, increased follow up, prescribing unnecessary drugs.
2) Avoidance behaviour (negative defensive medicine) – reflects doctors' attempts to distance themselves from sources of legal risk, eg, 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.

## The Emergency Department Doctors' 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.***

**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 – ie. eight to nine hours 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. F2s and STs' contracted weekly duties include a compulsory protected teaching & audit session from 9am to 11.30am every Thursday. Obviously the ST on leave and nights are not required to attend the teaching meeting but full attendance is mandatory for the rest (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.

F2s /STs are divided into two rotas; the A and B rota, depending on whether they are EM, F2 or GP trainees and A&B are swapped over after three months as the hours differ slightly. In practice, each ST will be paired off with an opposite number for the whole six months .The ST rota follows a repeating pattern every six weeks (there is a copy of this in Emergency Department for anyone who would like to see it). One of the consultants produces the rota, which will occasionally deviate from the pattern because of exam or interview leave etc. F2/STs can swap duties if they need a particular day off but unduly arduous, holiday relief is built in and usually there are alternate weekends off. F2s /STs are entitled to 25 days' leave each year. This means up to 13 days during six months in Emergency Department (including no more than three weekends and excluding night duty)

At least one F2s / STs must be off most of the time, usually excluding the first fortnight of August/February and Christmas week. If you don't plan this for yourselves, leave will be allocated by the consultants.. Each doctor will be unable to take certain weeks off depending on their slot in the rota, this will be explained to you when you arrive. In general, leave must start on a Monday and finish on a Sunday – it is on a first come first served basis - - you are advised to book asap.

If there is a problem with the rota, try to sort it out with your colleagues and remember to support each other – this is how all teams of doctors are supposed to work together. If this proves unsuccessful discuss it with the one of the consultants.

**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.

**Clinical Allocations**

A daily allocation sheet is posted in each area. This assigns you to resus majors, paeds, minors, and tells you which of the consultants is on call. Please stick to your clinical allocation, unless it is clear that another area needs extra medical resource.

## Sick Leave

You must tell your manager (Medical Directorate Office: Adrian on (028) 9442 4914 or Heather on (028) 9442 4664), if you are sick before the time you are due to go on duty or, if in exceptional circumstances this is not possible, within an hour of the time you were due to go on duty, and follow any departmental protocol in respect to reporting absence (Consultants: inform your Consultant colleagues of your sickness, Juniors: inform your supervising Consultant of your sickness).

If you work shifts, evenings or night duty you must tell your appointed contact Consultant On-Call at least four hours before the shift starts. If, in exceptional circumstances this is not possible, within an hour of the time you were due to go on duty.

If you have not already given the following information, your manager must clarify with you:

- the reason for your absence;
- how long you are likely to be off;
- what tasks will have to be covered during your absence; and
- 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.

***If you are sick or unable to work for any other reason, you or your family must tell one of the Emergency Department Consultants in person as soon as possible. Failure to do this would constitute a serious breach of your professional responsibility. There can be no exceptions to this rule. The directorate office must be informed also. 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 renumeration 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. Remember that sick leave rates, especially for casual sick leave, are closely monitored by all hospitals and***

***are almost always disclosed on references. If you are concerned speak to your Educational Supervisor. Remember that special leave such as carer's leave, compassionate leave and paternity leave may be available if you have an issue with your private life .***

**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.

## 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. First of all the list has been put into alphabetical order so that you can learn it by heart - it will be well worth the trouble!

- **A is for aortic aneurysms & ankle fractures**
- **B is for bleeding into the abdomen after trauma and Biologics for chronic disease**
- **C is for central disc protrusion and chest pain**
- **D is for drunks with head injury, dislocated knee joints & for diabetes**
- **E is for ectopic pregnancy**
- **F is for fractured neck of femur, fat pad signs & follow-up x-rays**
- **G is for glass**
- **H is for hand and wrist lacerations & hyperventilation & head injuries on warfarin**
- **I is for ischaemic feet**
- **J is for juvenile fractures (especially greenstick, elbow and clavicle)**
- **K is for kids with sepsis, dehydration or UTIs**
- **L is for late-presenting paracetamol overdose**
- **M is for meningococcal disease & multiple rib fractures**
- **N is for never miss a clinical scaphoid fracture**
- **O is for ocular lacerations and penetrating injury, osteoporosis & osteomyelitis**
- **P is for tight or painful plaster of Paris**

- **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.**

**Biological agents** **are much more common for a range of auto immune diseases, have a low index for suspicion for significant underlying infection.**

- **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. 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 the 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 <u>important to advise and document the patient to re-attend</u> if severe hip pain or difficulty in weight bearing persist for more than 48 hours. Never discharge a patient who is unable to walk following hip injury admit to ward on hip pathway and request CT pelvis. If they come back, <u>always</u> 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.**

***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. <u>An elbow that cannot straighten has a fracture</u>. 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 the 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**

**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'.**

- **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". Pyrexic 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 rapid medical assessment and commence on parvolex infusion pending serum paracetamol level. Patients who present later (up to 7 days) are a very high risk group – erect parvolex, check plasma glucose +LFT + coag screen and (serum**

**paracetamol is irrelevant at this stage). If bloods are normal 24 hrs post ingestion parvolex may be discontinued.**

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

***MCD* 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. <u>Always explain GLASS TEST</u> to parents when you are discharging a pyrexic 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 1st 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 and 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-ay 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- Volkmann'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 <u>MUST</u> be split. NEVER send somebody with a fresh fracture home in an unsplit cast.**

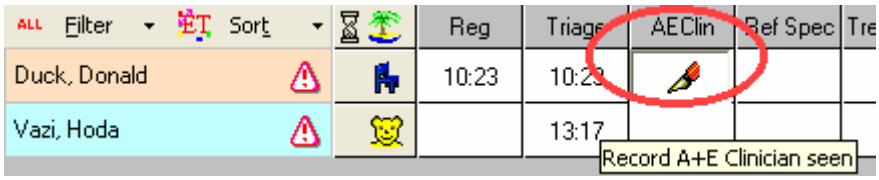
# A Reference Guide to Symphony for Clinical ED Staff

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

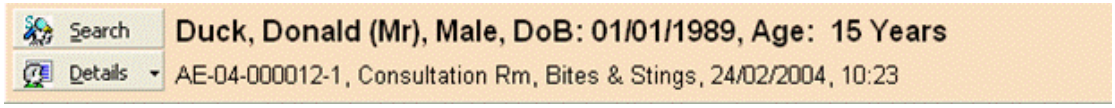
1. **ED Clinician**
2. **Consult**
3. **Diagnosis**
4. **DDTA / Discharge**

## 1. ED Clinician

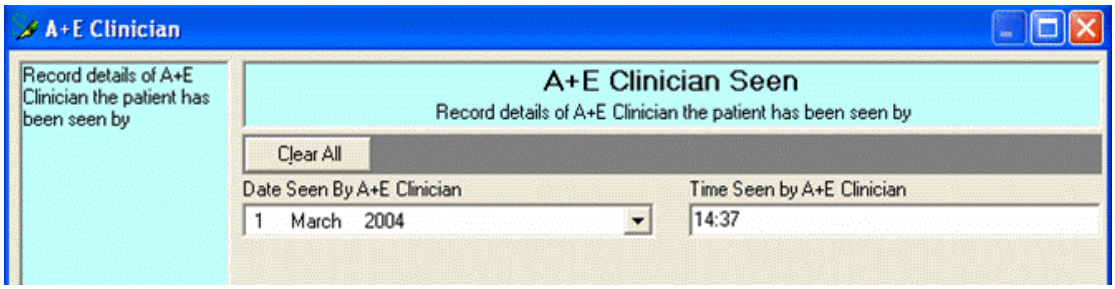
**Click into 'AE CLINICIAN' on the Tracking Grid**
**If you hover over the DEP stage it will give you a hint as to what is required at that stage**




**Ensure the correct patient is displayed in the Patient Banner**



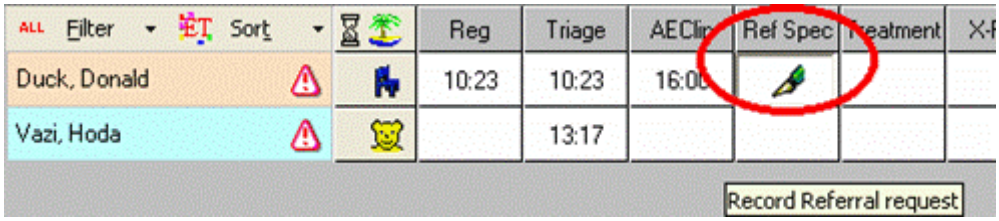

**Record the date and time that you have seen your patient, if need be, edit this information**



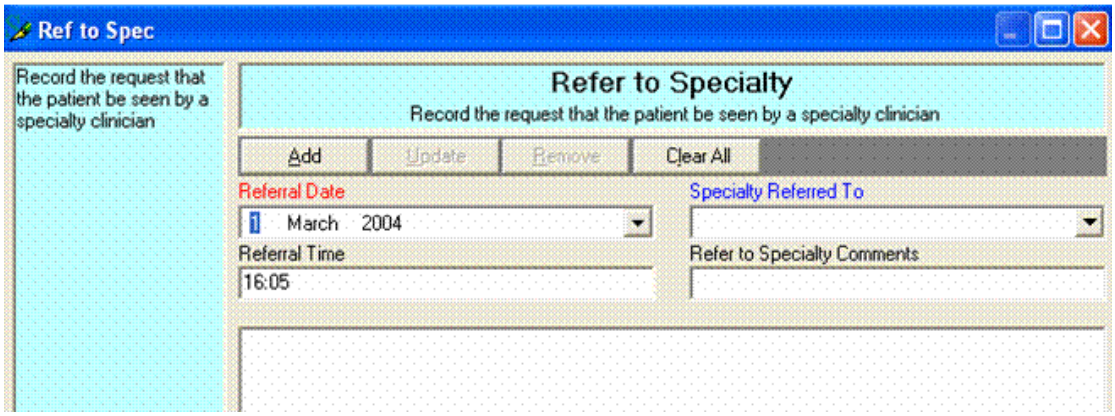

**Update the location that your patient is being moved to**

## 2. Consult

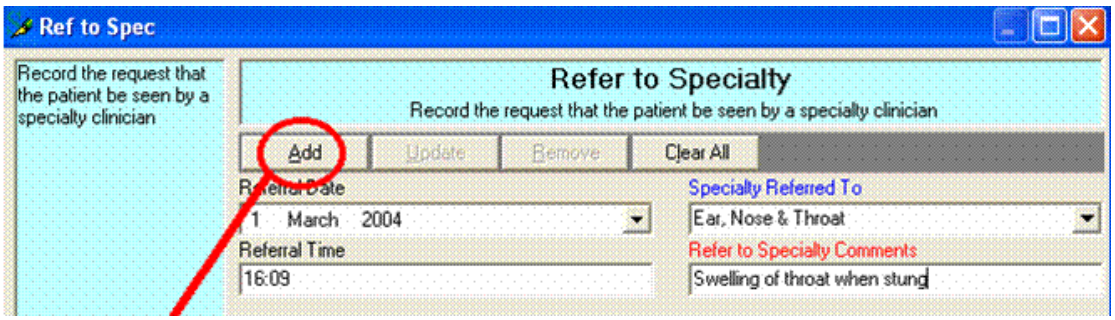
**Click into 'SPECIALTY' on the Tracking Grid**




**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**



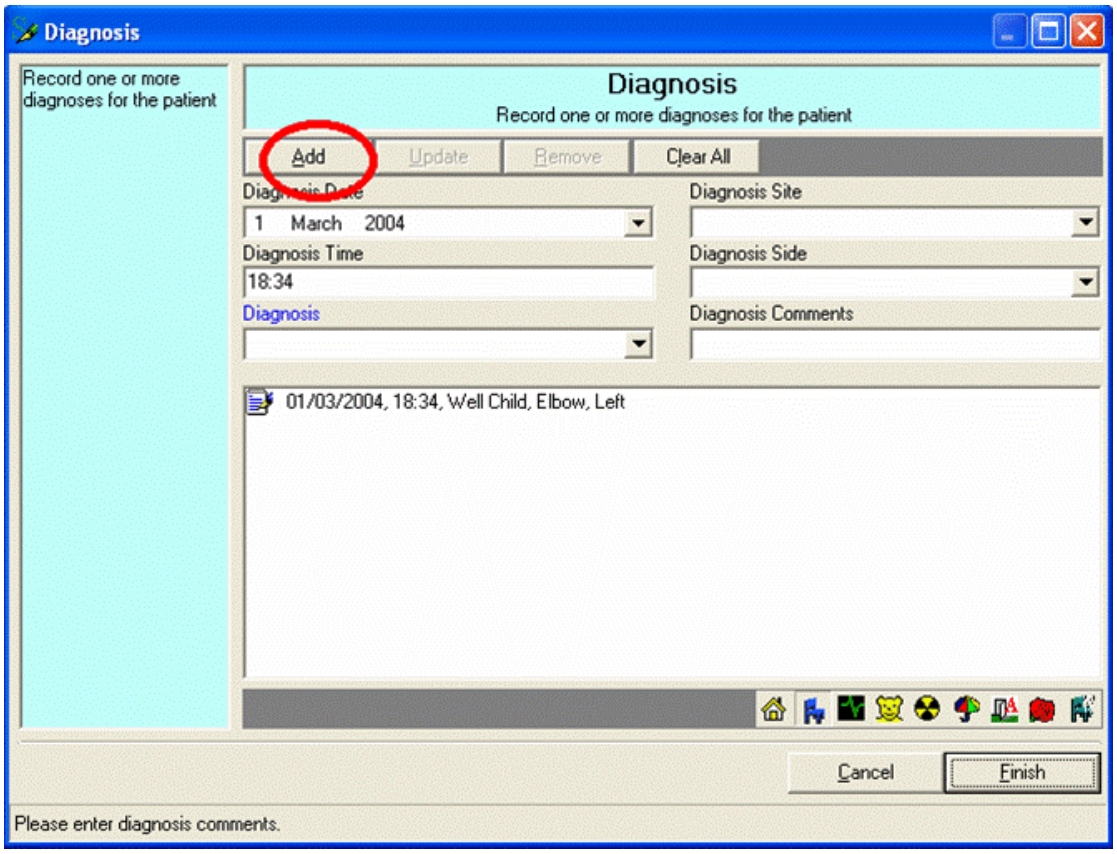

**Select the specialty to which you are referring and record any comments from the specialty, e.g. if they are caught up in theatre, and click 'ADD'**




**If additional referrals are required, repeat the above process**
**Update the patients location as necessary**
**Click on the 'FINISH' button**
**If additional referrals are required, repeat the above process**
**Update the patients location as necessary**
**Click on the 'FINISH' button**

## 3. **Diagnosis**

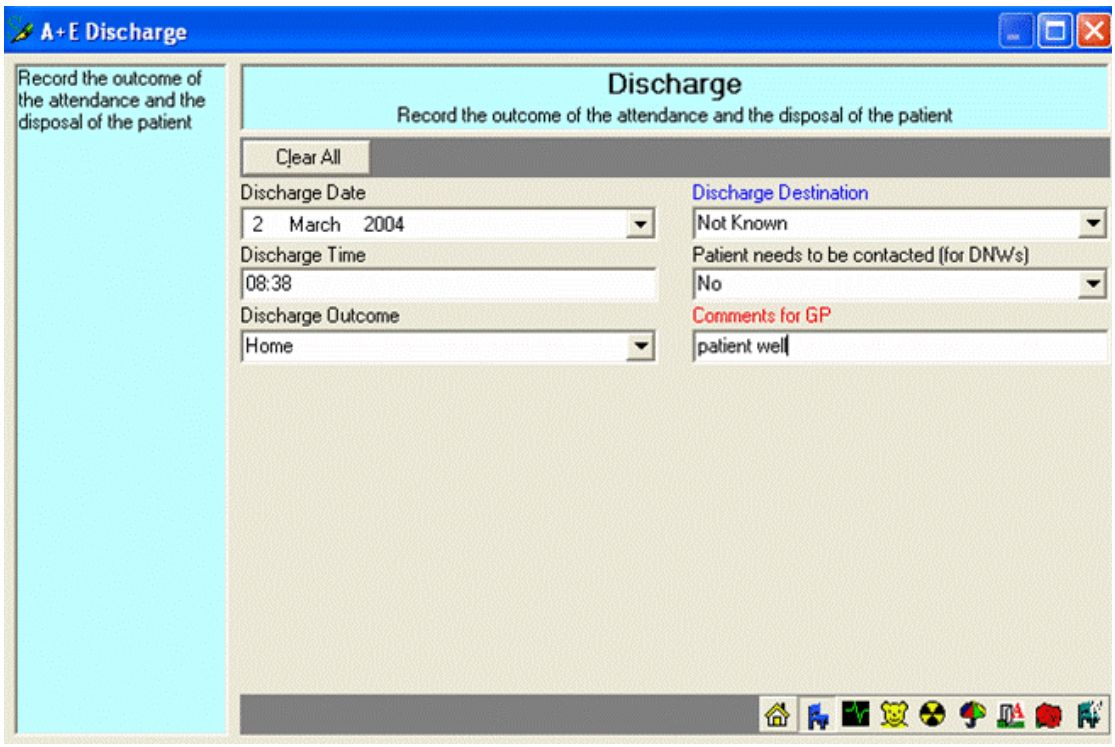
**Click on 'DIAGNOSIS' on the Tracking Grid**
**Ensure the correct patient is displayed in the Patient Banner**
**Record the date and time that you have diagnosed your patient, if need be, edit this information**
**Select the diagnosis for your patient and click on 'ADD'**




**Click If additional diagnosis have been made, repeat the process above**
**Update the patients 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**




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

## SECTION TWO – 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".

**This section covers:**
**What to do**
**An Overview of the Major Incident response**
**The Three Ts of a major Incident**
**Action Cards**

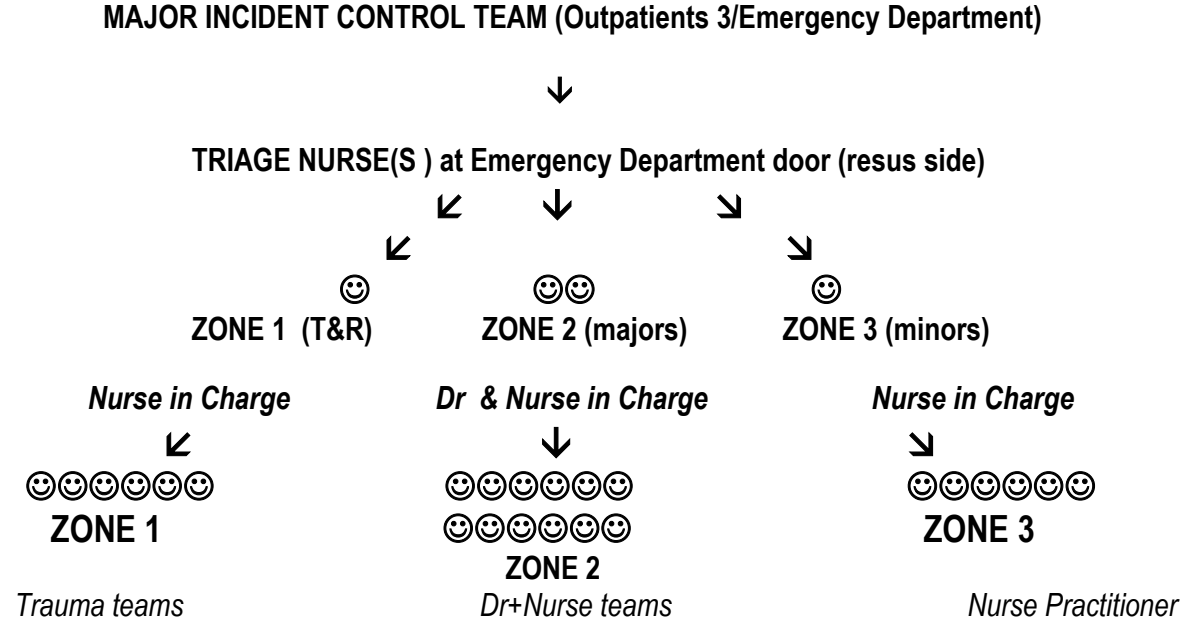
## What to do

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 (eg 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 five areas :**

1. **THE INFLATABLE DECOMNTAMINATION TENT (if indicated)**
2. **A SINGLE TRIAGE POINT (at the Emergency Department resus side of the Emergency Department entrance)**
3. **RED ZONE (Resus): For patients who are in <u>imminent</u> danger of death**
4. **YELLOW ZONE (Majors): For patients who cannot walk**
5. **GREEN ZONE(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.




## 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**

### 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):** **IMMINENT 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 CUBICLES**
**GREEN AREA:** **ZONE THREE: PHYSIO/DAY SURGERY**
**WHITE AREA:** **TEMPORARY MORTURARY IDENTIFIED BY EMERGENCY DEPARTMENT SISTER**
****** EVEN IF PATIENTS HAVE TRIAGE LABELS ON THEY STILL REQUIRE RE-TRIAGE AT THIS POINT******

## 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.

## Major Incident Treatment Protocols - Action Cards

**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 EMERGENCY DEPARTMENT 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.**
**You must 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 EMERGENCY DEPARTMENT 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**

# SECTION THREE – CLINICAL GUIDANCE (ADULTS)

## Study this section and use it for reference.

## Clinical Guidance – Adults

| | |
|---|---|
| 1) Resusitation Guidelines: | Adult Advanced Life Support |
| | Paediatric Advanced Life Support |
| | Tachycardia |
| | Bradycardia |
| | Anaphylaxis |
| | Shock |
| | Surviving Sepsis Bundle |
| | Trauma Primary Survey |
| | Call and Send |
| | Traumatic Carciac Arrest & Thorocotomy |
| | Haemorrhage Control |
| | Massive Transfusion Policy |
| | Anticoagulation reversal in life threatening bleeding |
| 2) Cardiovascular | AAA |
| | Chest pain & ACS |
| | Acute LVF |
| | Thrombo-embolic events (PE/DVT) |
| | Implantable ICDs |
| 3) Respiratory | Asthma |
| | Chest Infection |
| | COPD |
| | Respiratory Failure and NIV |
| | Pneumothorax |
| 4) Gastroenterology | Abdominal Pain |
| | GI Bleeding & Varices |
| 5) Genitourinary | Acute Urine Retention |
| | Frank Haematuria |
| | Renal Colic |
| | Testicular Pain |
| 6) Renal | Haemodialysis |
| | Hyperkalaemia |
| 7) Mental Health Problems | MHO |
| | Drug and solvent misuse |
| | Alcohol withdrawal syndrome |
| | Alcohol and the Law |
| 8) CNS | The unconscious patient |

| | |
|---|---|
| | Status Epilepticus<br>Fits/Faints/Funny turns<br>Headaches<br>Stroke<br>TIA |
| 9) Cancer/Chemotherapy | Neutropenic Sepsis |
| 10) Palliative Care | |
| 11) Toxicology | |
| 12) Metabolic/Diabetes | DKA<br>Hypoglycaemia |
| 13) ENT | |
| 14) Opthalmology | |
| 15) Infectious Disease | |
| 16) Major Trauma/Burns | |
| 17) Injury & MSK | |
| 18) Obs & Gynae | |
| 19) Pain Relief and Sedation | |

## 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/Head tilt, chin lift manoeuvre
  Yankeur suction
  Guedel airway/nasopharyngeal airway
  iGEL
  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 15L Oxygen NRB mask

### *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 2nd intercostal space mid clavicular line then arrange for chest drain.**

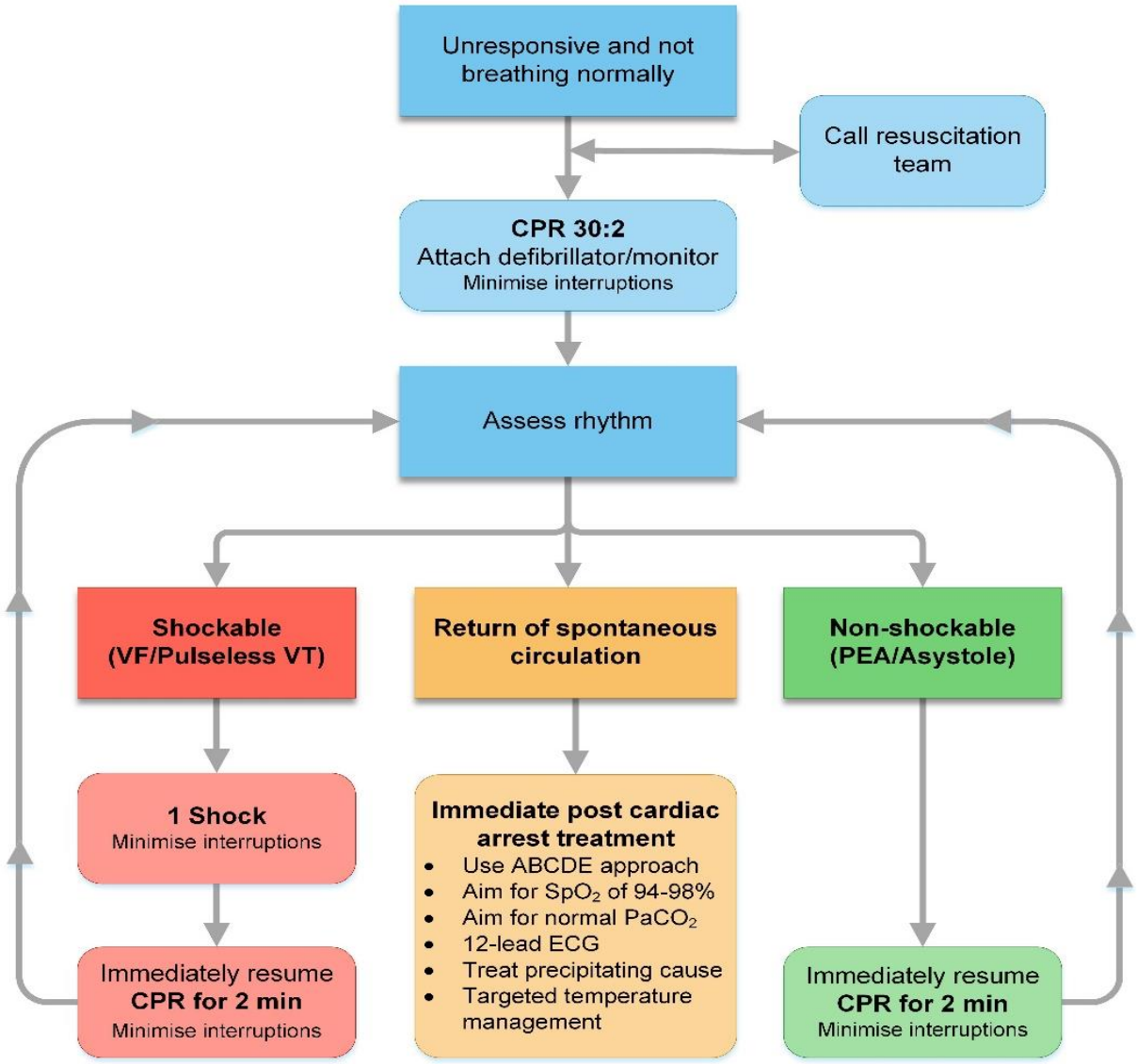
****PEA: Tension pneumothorax, hypovolaemia, drugs, pulmonary embolism, hypothermia, cardiac tamponade, electrolyte disturbance, massive brain injury, cardiac rupture**

RESUSCITATION - ABC

## EWS SCORE: 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 EWS score used in Antrim Hospital is based on a province-wide guideline. The related actions are MANDATORY and subject to regular audit.

ADVANCED ADULT CARDIAC ARREST




**During CPR**

- Ensure high quality chest compressions
- Minimise interruptions to compressions
- Give oxygen
- Use waveform capnography
- Continuous compressions when advanced airway in place
- Vascular access (intravenous or intraosseous)
- Give adrenaline every 3-5 min
- Give amiodarone after 3 shocks

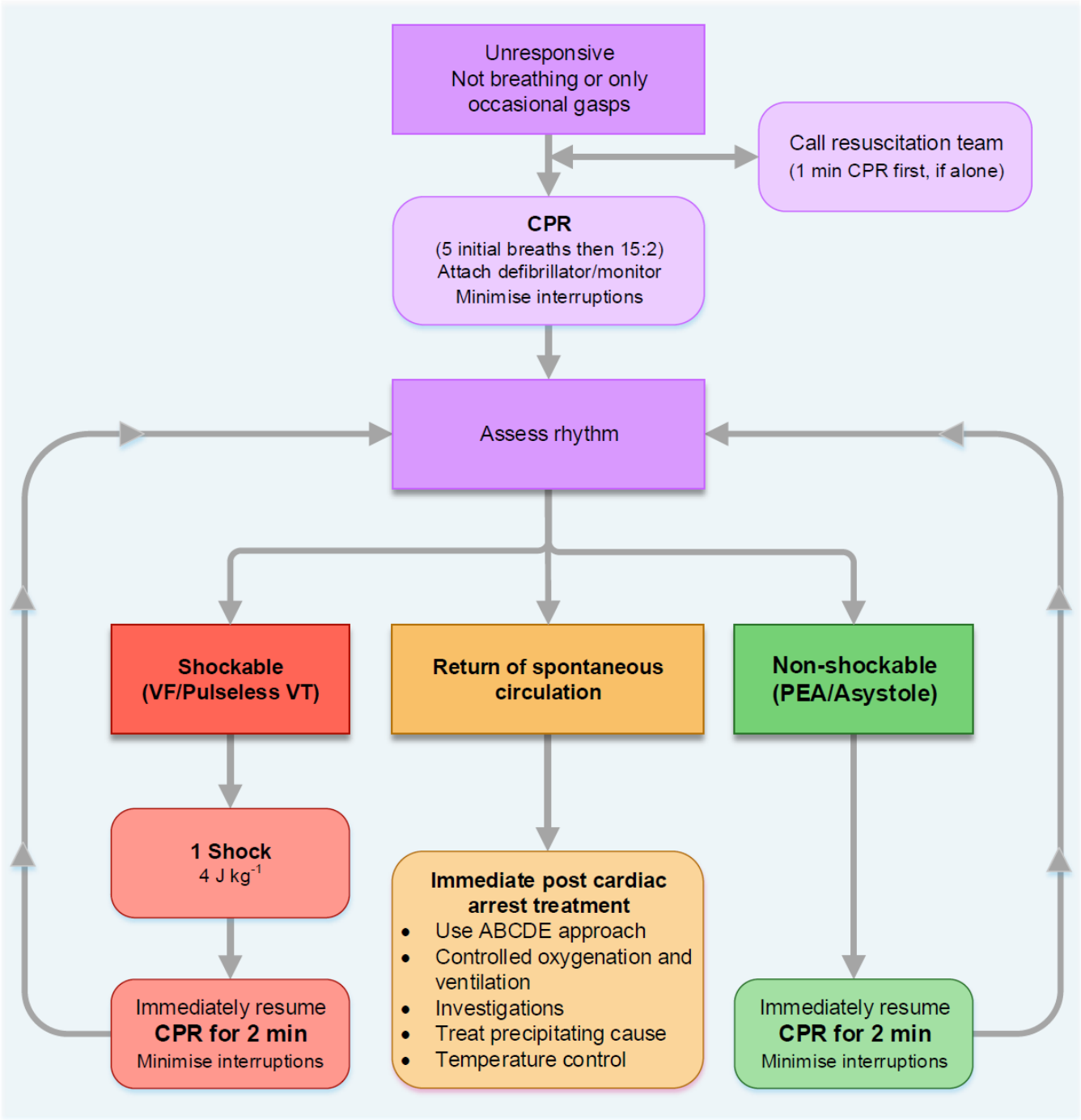
**Treat Reversible Causes**

- Hypoxia
- Hypovolaemia
- Hypo-/hyperkalaemia/metabolic
- Hypothermia
- Thrombosis - coronary or pulmonary
- Tension pneumothorax
- Tamponade – cardiac
- Toxins

**Consider**

- Ultrasound imaging
- Mechanical chest compressions to facilitate transfer/treatment
- Coronary angiography and percutaneous coronary intervention
- Extracorporeal CPR

# Paediatric Advanced Life Support



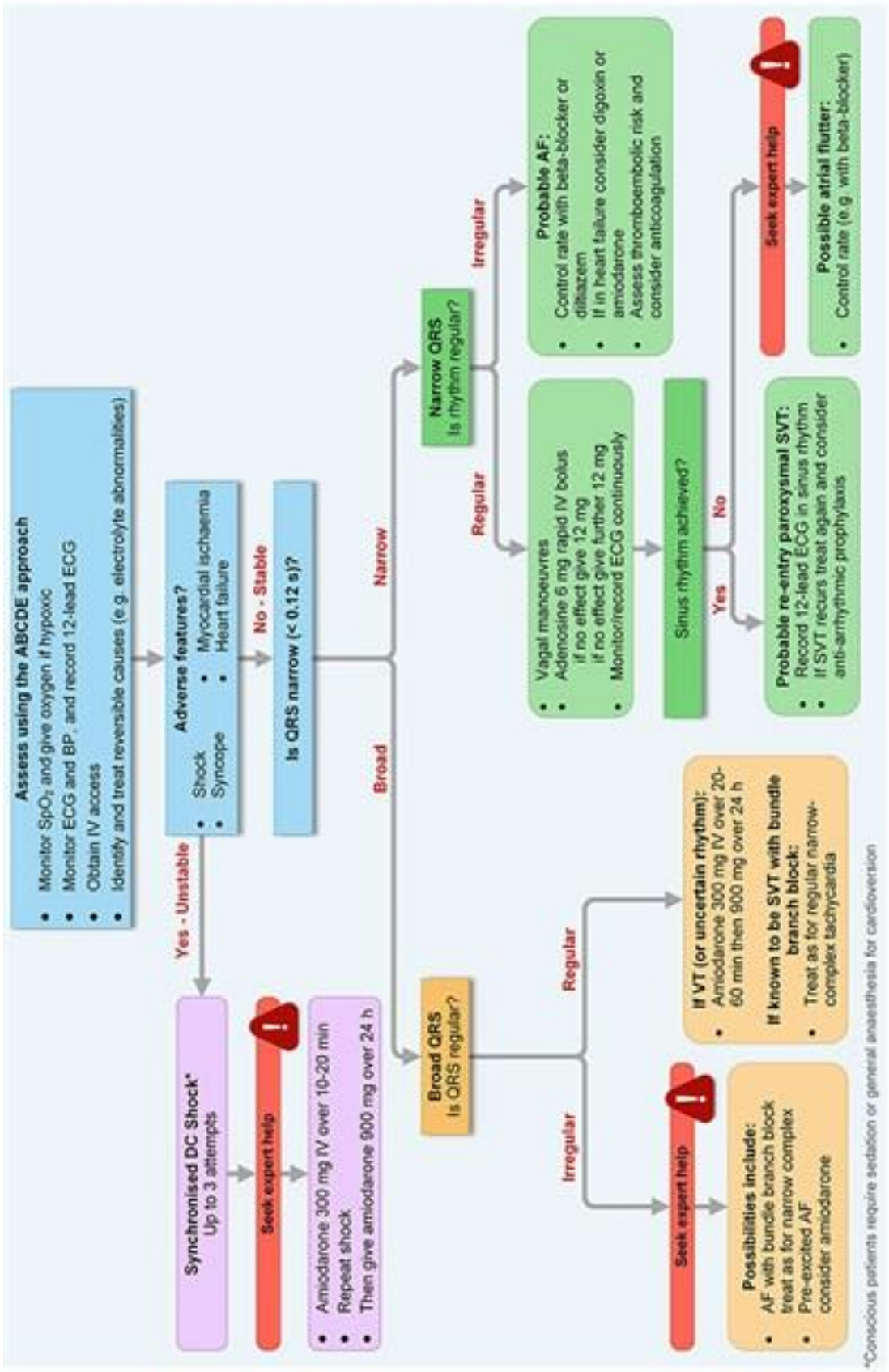

**During CPR**

- Ensure high-quality CPR: rate, depth, recoil
- Plan actions before interrupting CPR
- Give oxygen
- Vascular access (intravenous, intraosseous)
- Give adrenaline every 3-5 min
- Consider advanced airway and capnography
- Continuous chest compressions when advanced airway in place
- Correct reversible causes
- Consider amiodarone after 3 and 5 shocks

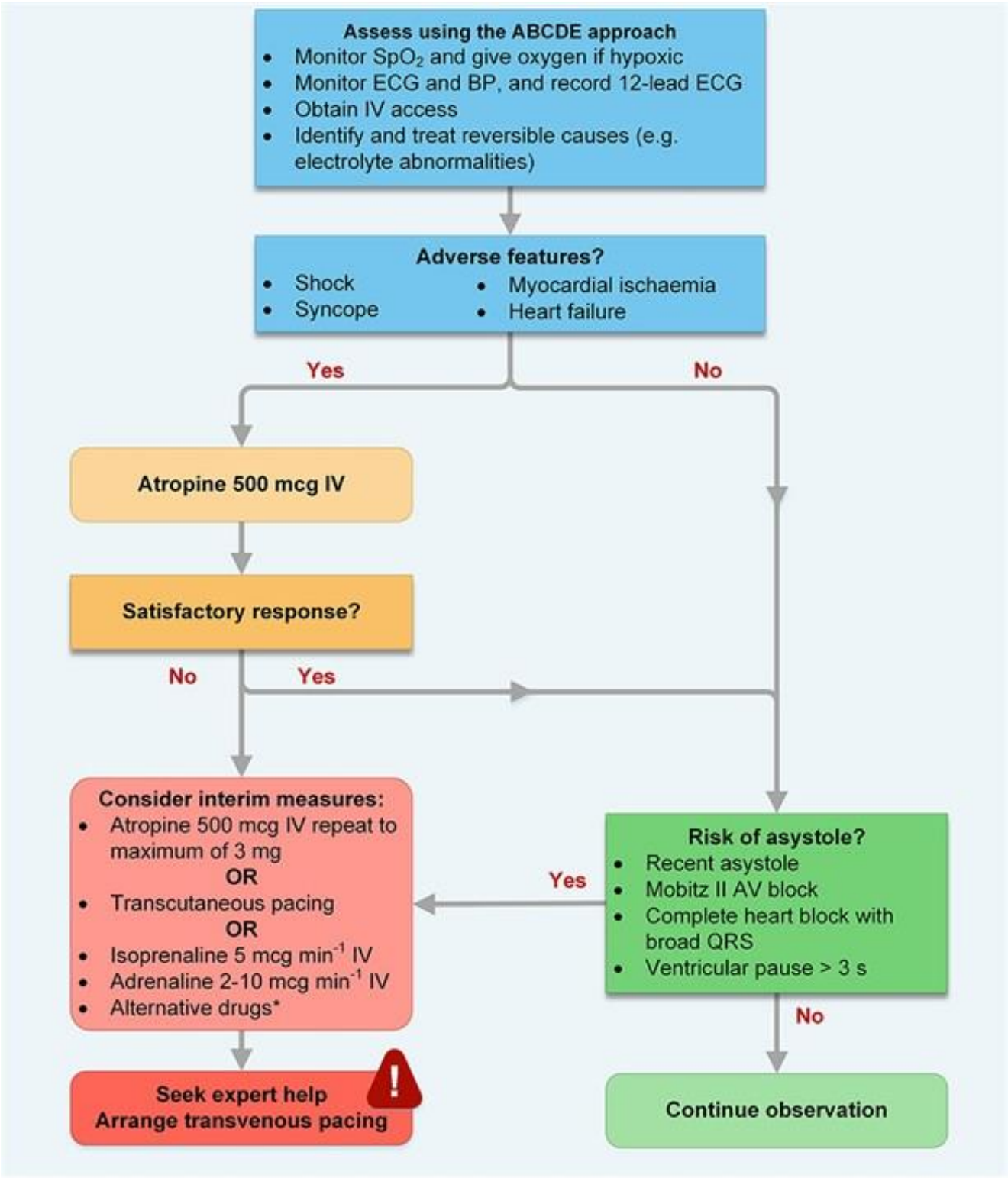
**Reversible Causes**

- Hypoxia
- Hypovolaemia
- Hyper/hypokalaemia, metabolic
- Hypothermia
- Thrombosis (coronary or pulmonary)
- Tension pneumothorax
- Tamponade (cardiac)
- Toxic/therapeutic disturbances

## ADULT TACHYCARDIA WITH PULSE ALGORITHM



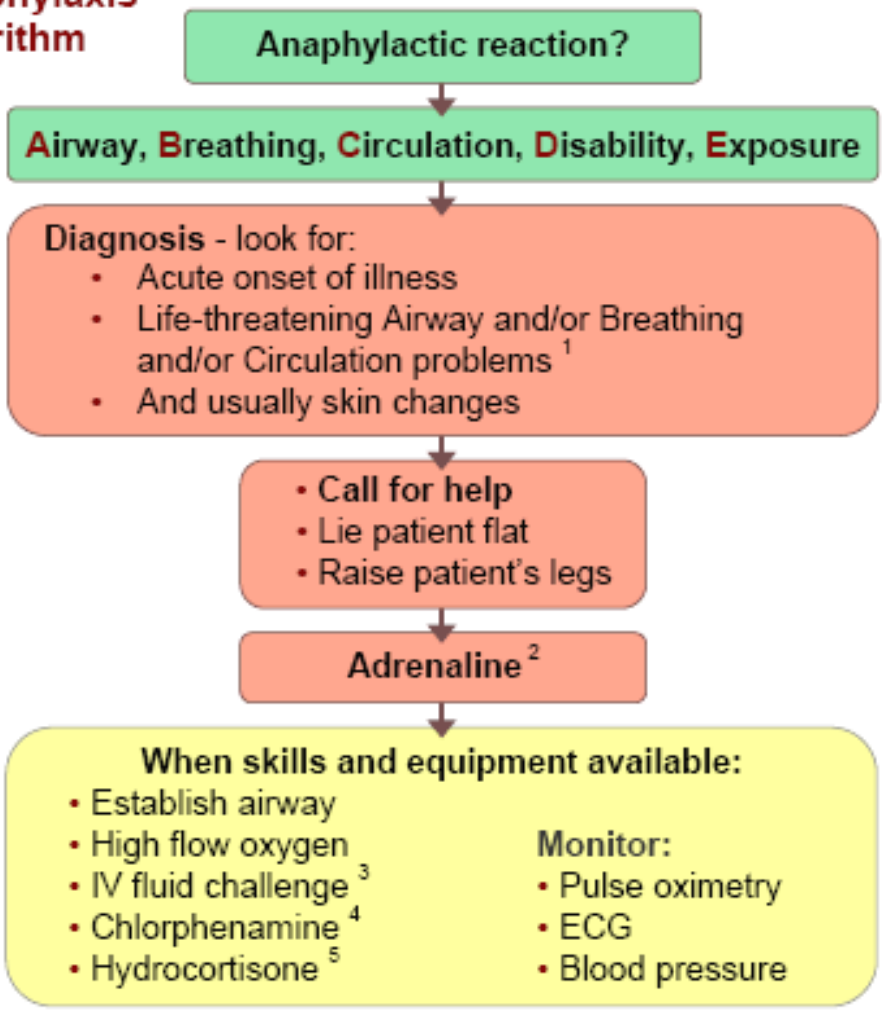
## Adult bradycardia algorithm




*** Alternatives include:**

- Aminophylline
- Dopamine
- Glucagon (if bradycardia is caused by beta-blocker or calcium channel blocker)
- Glycopyrrolate (may be used instead of atropine)

## Anaphylaxis algorithm




**[1] Life-threatening problems:**

| | |
|---|---|
| **Airway:** | swelling, hoarseness, stridor |
| **Breathing:** | rapid breathing, wheeze, fatigue, cyanosis, $SpO_2$ < 92%, confusion |
| **Circulation:** | pale, clammy, low blood pressure, faintness, drowsy/coma |

**[2] Adrenaline** *(give IM unless experienced with IV adrenaline)*

IM doses of 1:1000 adrenaline (repeat after 5 min if no better)

| | |
|---|---|
| • Adult | 500 micrograms IM (0.5 mL) |
| • Child more than 12 years: | 500 micrograms IM (0.5 mL) |
| • Child 6 -12 years: | 300 micrograms IM (0.3 mL) |
| • Child less than 6 years: | 150 micrograms IM (0.15 mL) |

Adrenaline IV to be given only by experienced specialists
Titrate: Adults 50 micrograms; Children 1 microgram/kg

**[3] IV fluid challenge:**

Adult - 500 – 1000 mL
Child - crystalloid 20 mL/kg

Stop IV colloid
if this might be the cause of anaphylaxis

| | [4] Chlorphenamine (IM or slow IV) | [5] Hydrocortisone (IM or slow IV) |
|---|---|---|
| Adult or child more than 12 years | 10 mg | 200 mg |
| Child 6 - 12 years | 5 mg | 100 mg |
| Child 6 months to 6 years | 2.5 mg | 50 mg |
| Child less than 6 months | 250 micrograms/kg | 25 mg |

## Shock – *inadequate tissue perfusion*

- **Shock is a state of systemic hypo perfusion, with inadequate blood supply to the tissues**
-

Shock is extraordinarily important because it is generally a *final common pathway* before death. Most serious diseases are capable of causing shock. Left untreated, shock will progress to multi-organ failure and death. However, shock is often *reversible*, thereby avoiding death.

In order to understand the pathophysiology, and the subsequent management, of shock equations are extremely useful

- ***Blood pressure (BP) = Cardiac output (CO) X systemic vascular resistance (SVR)***

- **Hypovolaemia:**
  Early signs are tachycardia, tachypnoea (without increased respiratory effort), delayed capillary refill, poor urinary output.
  Apart from trauma, common causes of occult fluid loss are ruptured abdominal aortic aneurysm and GI bleeding (do a PR).

- **Cardiogenic:**
  Hypo-perfusion with jugular venous distension. Abnormal ECG. Unless you are certain, consider a fluid challenge +/- CVP monitoring prior to inotropes. Remember tension pneumothorax, tamponade and pulmonary embolism can present this way - exclude by clinical examination or x-ray if examination inconclusive.

- **Anaphylactic:**
  History of previous anaphylaxis. Collapse. May be upper or lower respiratory tract obstruction as well. Adrenaline 0.5ml of 1 in 1,000 im. Repeat if ineffective.

- **Neurogenic:**
  Overt spinal trauma or unsuspected spine injury (e.g. with head injury), hypotension but normal or increased capillary refill. Meticulous spinal care, iv fluids in moderation, maintain temp.

- **Septic:**
  Hypotension, pyrexia, tachypnoea, metabolic acidosis, altered menta status. Fluids, cultures, broad spectrum antibiotics (e.g Tazocin & gentamicin)
  (NB: Special types of 'septic' shock: "toxic shock syndrome" and meningococcal septicaemia require specific antibiotics).

# Could this be sepsis?

For a person of any age with a possible infection:

- Think **could this be sepsis?** if the person presents with **signs or symptoms that indicate infection**, even if they do not have a high temperature.
- Be aware that people with sepsis may have non-specific, non-localised presentations (for example, feeling very unwell).
- Pay particular attention to concerns expressed by the person and their family or carer.
- Take particular care in the assessment of people who might have sepsis if they, or their parents or carers, are unable to give a good history (for example, people with English as a second language or people with communication problems).

## Assessment

Assess people with suspected infection to identify:

- possible source of infection
- risk factors for sepsis (see right-hand box)
- indicators of clinical of concern such as new onset abnormalities of behaviour, circulation or respiration.

Healthcare professionals performing a remote assessment of a person with suspected infection should seek to identify factors that increase risk of sepsis or indications of clinical concern.

## Risk factors for sepsis

- The very young (under 1 year) and older people (over 75 years) or very frail people.
- Recent trauma or surgery or invasive procedure (within the last 6 weeks).
- Impaired immunity due to illness (for example, diabetes) or drugs (for example, people receiving long-term steroids, chemotherapy or immunosuppressants).
- Indwelling lines, catheters, intravenous drug misusers, any breach of skin integrity (for example, any cuts, burns, blisters or skin infections).

**If at risk of neutropenic sepsis – refer to secondary or tertiary care**

**Additional risk factors for women** who are pregnant or who have been pregnant, given birth, had a termination or miscarriage within the past 6 weeks:

- gestational diabetes, diabetes or other comorbidities
- needed invasive procedure such as caesarean section, forceps delivery, removal of retained products of conception
- prolonged rupture of membranes
- close contact with someone with group A streptococcal infection
- continued vaginal bleeding or an offensive vaginal discharge.

## Sepsis not suspected

- no clinical cause for concern
- no risk factors for sepsis.

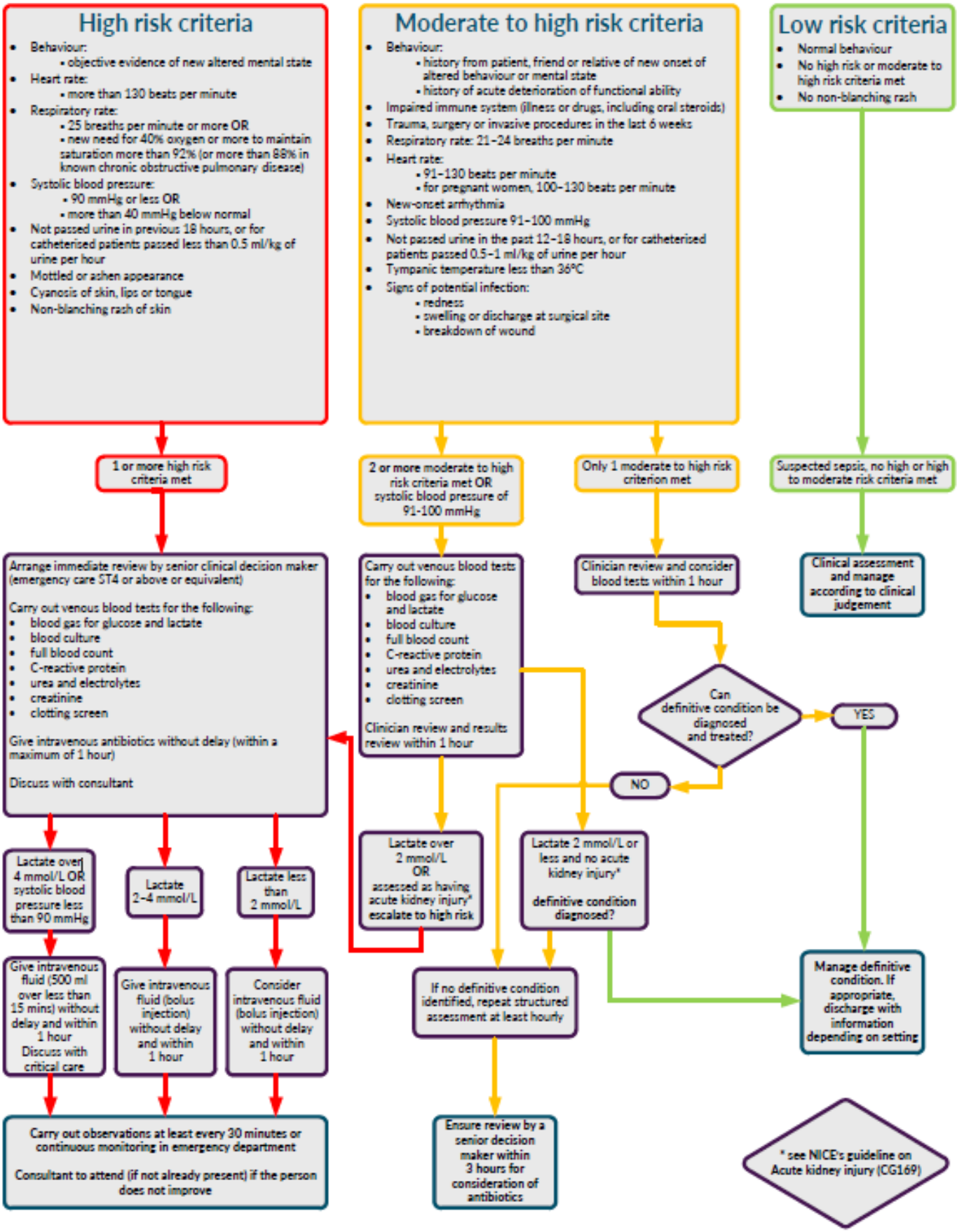
Use clinical judgement to treat the person, using NICE guidance relevant to their diagnosis when available.

## SEPSIS SUSPECTED

**If sepsis is suspected, use a structured set of observations to assess people in a face-to-face setting.**
**Consider using early warning scores in acute hospital settings.**
**Parental or carer concern is important and should be acknowledged.**

Stratify risk of severe illness and death from sepsis using the tool appropriate to age and setting > > >

# Sepsis risk stratification tool: people aged 18 and over in hospital




NICE National Institute for Health and Care Excellence

## HOUR-1 BUNDLE: INITIAL RESUSCITATION FOR SEPSIS AND SEPTIC SHOCK:

1) Measure lactate level.*
2) Obtain blood cultures before administering antibiotics.
3) Administer broad-spectrum antibiotics.
4) Begin rapid administration of 30mL/kg crystalloid for hypotension or lactate ≥4 mmol/L.
5) Apply vasopressors if hypotensive during or after fluid resuscitation to maintain a mean arterial pressure ≥ 65 mm Hg.

*Remeasure lactate if initial lactate elevated (> 2 mmol/L).

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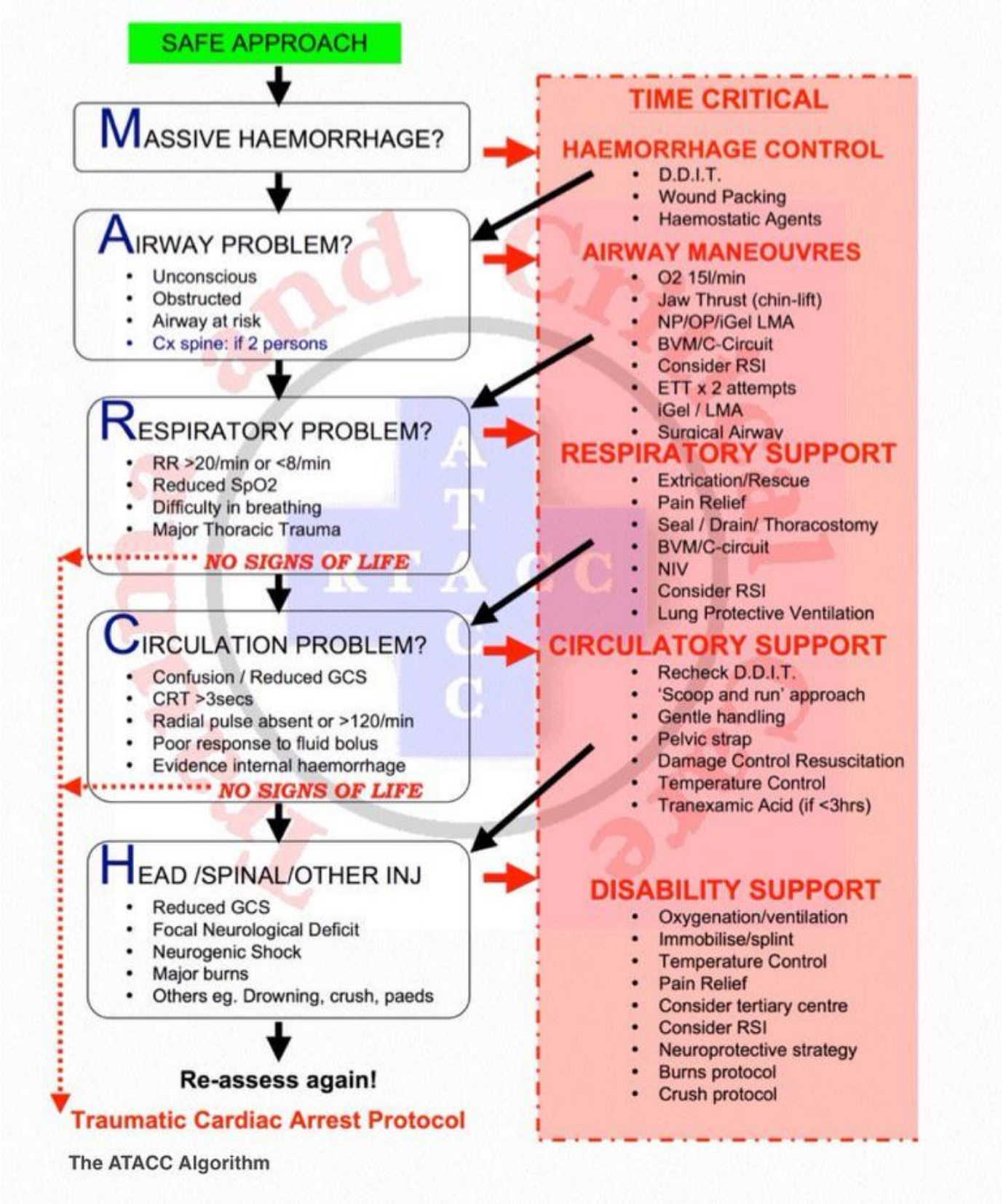
survivingsepsis.org

## Trauma Primary Survey



The ATACC Algorithm

# Major Trauma?

| | | |
|---|---|---|
| **T** | **Tranexamic Acid** | 1g bolus, then 1g over 8hours |
| **R** | **Resuscitation** | Activate Major Transfusion Protocol<br>Limit Crystalloid Use<br>Consider rapid infuser<br>Hypotensive resuscitation |
| **A** | **Avoid Hypothermia** | Target temp >36°C<br>Remove wet clothing and sheets<br>Warm blood/fluids<br>Use warming blanket |
| **U** | **Unstable?** | Haemorrhage control, decompression, decontamination and splintage<br>Unstable, coagulopathic, hypothermic or acidotic, perform damage control surgery |
| **M** | **Metabolic** | Avoid Acidosis<br>If lactate >5mmol/L or rising, consider stopping |
| **A** | **Avoid Vasoconstrictors** | May be required in cases of spinal cord or traumatic brain injury |
| **T** | **Test Clotting** | Check clotting every 90 mins<br>Aim platelets >75x10<br>Aim INR <1.5<br>Aim Fibrinogen >1.5g/L |
| **I** | **Imaging** | Consider FAST, CT or Interventional Radiology |
| **C** | **Calcium** | Maintain ionised $Ca^{2+}$ >1.0mmol/L<br>Administer 10mls 10% Calcium Chloride over 10 mins PRN |

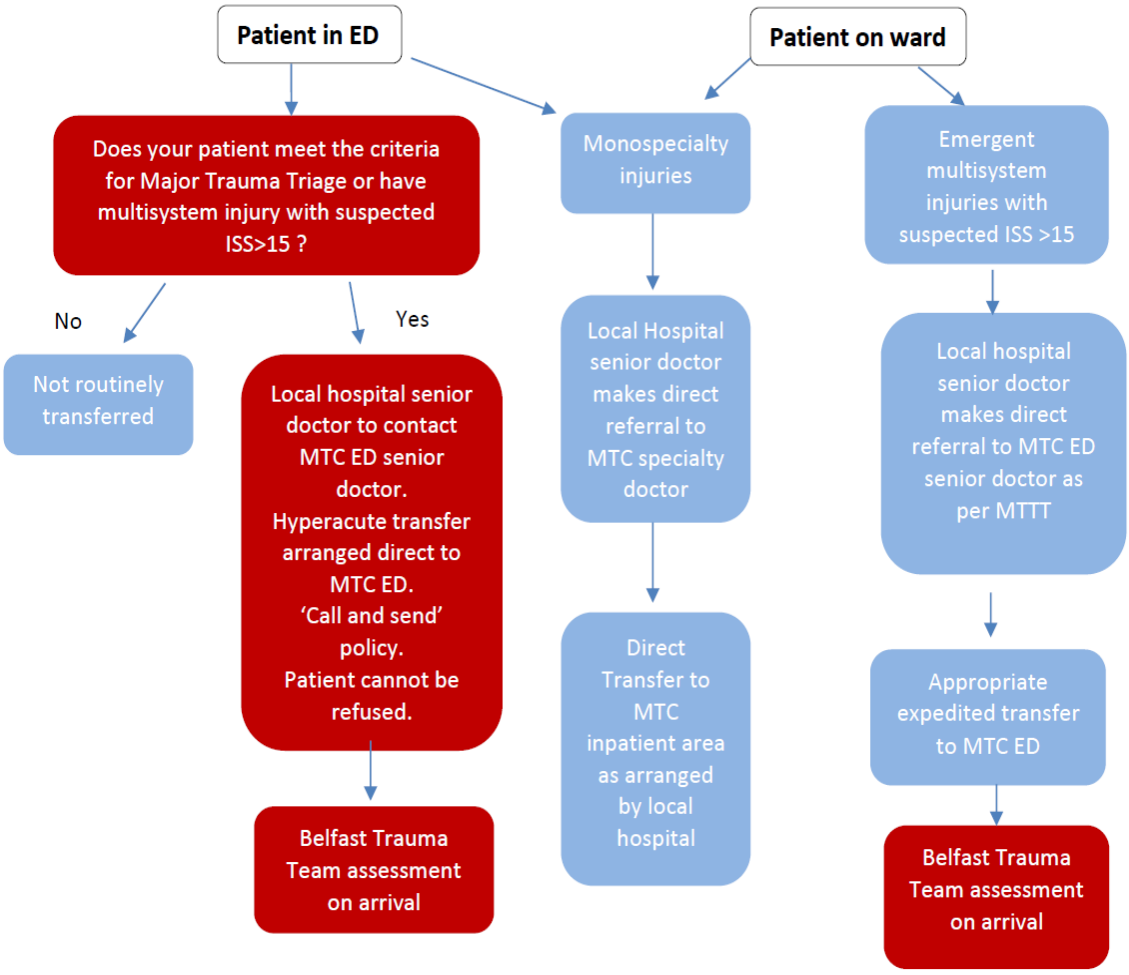
# CALL & SEND FOR ADULT MAJOR TRAUMA (age >=14 years)

Northern Ireland Major Trauma Network

## RVH ED RED PHONE 02890 634990

## NIAS 999 "MAJOR TRAUMA EMERGENCY TRANSFER"

- Call & Send aims to reduce unnecessary delay in transfers where the patient requires definitive care at the Major Trauma Centre (MTC).
- In order to deliver a time critical senior doctor referral local hospitals should phone the RVH red phone on **02890 634990** and contact NIAS via **999** to request a "Major Trauma Emergency Transfer".
- Patient with 'mono-specialty' injuries should continue directly to an inpatient service as per existing policy.
- If a major trauma patient is suitable for local clinical management that practice should continue as per existing arrangements.



## Appendix 1

Trauma is as defined in the NI Major Trauma Network Triage tool as follows

(i) In the context of Major injury abnormal vital signs or level of consciousness

- Glasgow Coma score <= 12
- Systolic blood pressure <90
- Respiratory rate <10 >29

(ii) Abnormal anatomy relating to injury

- Severe Chest injury with altered physiology (eg Flail chest, open pneumothorax)
- Complex limb injuries / amputation and/or vascular compromise.
- Penetrating trauma to neck, chest, abdomen, back or groin
- Suspected open and/or depressed skull fracture
- Suspected pelvic fracture
- Spinal trauma with abnormal neurology
- Trauma along with facial and/or circumferential burns / Burns >20%

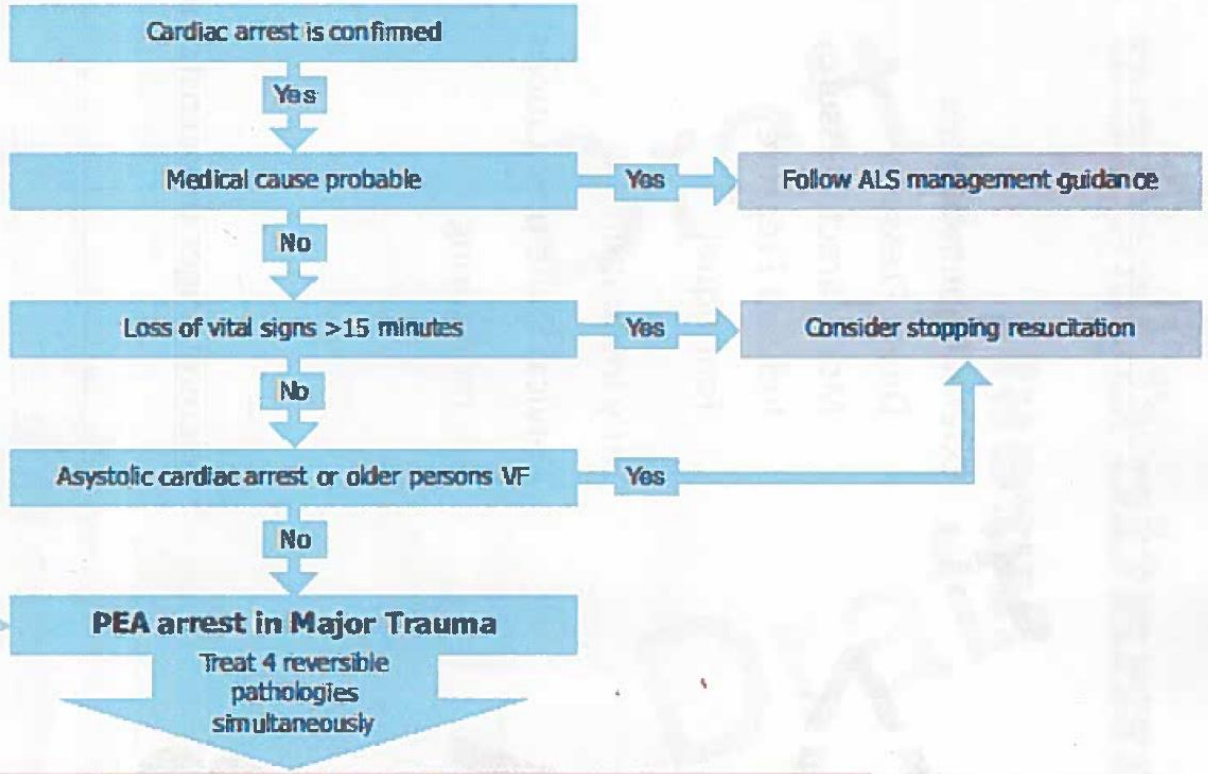
(iii) Evaluate Mechanism of injury / Caution in the Elderly

- Traumatic death in the same compartment
- Falls > x2 body height
- Person trapped under vehicle
- Bullseye window and / or damage to the 'A' post of the vehicle
- Caution with the older person on anticoagulants or with a systolic BP<110 mmHg in the context of major trauma

The above criteria in the context of injury may predict Major trauma and qualify for use of the Call and send pathway.

# Adult Traumatic Cardiac Arrest

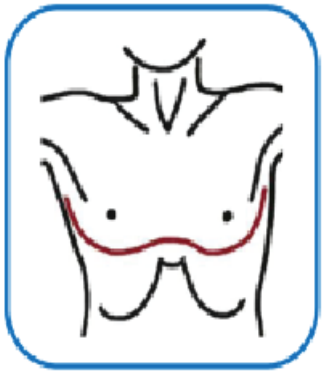
Belfast Health and Social Care Trust




In PEA Traumatic Cardiac Arrest chest compressions take low priority. Address reversible pathology, vasopressors are not indicated.

| | |
|---|---|
| **1. Hypoxia:** | Oxygenate: Intubate/LMA, Ventilate |
| **2. Volume:** | Give O-VE Stat/consider major haemorrhage protocol/ give tranexamic acid 1g/consider pelvic binder |
| **3. Tension Pneumothorax:** | Bilateral open thoracostomies. No need for chest drain at this stage |
| **4. Tamponade:** | Ultrasound heart - Consider emergency resuscitative thoracotomy. |
| **5. General consideratoins** | • Consider likely cause based on mechanism.<br>• Is there an indication for emergency room thoracotomy?<br>• TTL to advise when to cease resuscitation effort. |

# Clamshell Thoracotomy



Immediate Thoracotomy required

**Concurrent actions**
- Intravenous/intraosseous access with **blood/fluid bolus**
- **ECG** monitoring through **defibrillation** pads
- Attach waveform **capnography**
- **DO NOT** delay thoracotomy to achieve these

**RAPID ANTISEPTIC**

**CLEAN**

Scalpel down to intercostal muscles, joining the bilateral open thoracostomies

Stop IPPV. Extend thoracostomies posteriorly to poster axillary line & then anteriorly to the sternum with mayo scissors or trauma shears. Cut through sternum with trauma shears or Gigli saw

Tent & incise the pericardium vertically in the midline, avoiding phrenic nerves (<60 seconds after commencing thoracotomy)

**HAEMOPERICARDIUM?**

YES

- Evacuate haemopericardium
- Inspect anterior & posterior heart for wounds
- Control haemorrhage with finger, sutures or staples. **LESS IS MORE**

NO

- Occlude descending aorta against thoracic vertebra
- **CONTROL haemorrhage:**

**Lung** – Hilar control: divide inferior pulmonary ligament & rotate lower lobe anteriorly over upper lobe (hilar twist). Consider staples for parenchymal injuries

**Intercostal vessels** – direct pressure ± packing

**Great vessels** – limited options, but attempt to suture

**ROSC**

NO

- Two handed internal cardiac compressions
- VF/VT – Close chest & use external defibrillation pads for cardioversion
- Further volume resuscitation ± 10mcg/kg epinephrine if heart is full

YES

- Clamp internal mammary arteries if required
- Transport to MTC, activate MTP & theatres
- Sedation & neuromuscular blockade as needed
- Tranexamic Acid 15mg/kg (max 1g)

**ROSC**

NO

YES

**Successful**

**Unsuccessful**

Consider stopping resuscitation

# Haemorrhage Control

Blood on the floor and four more

*Remember PPE*

Activate Massive Transfusion Procedure **Early** if required

## External

**DDIT**

**Direct Pressure**

**Direct Pressure**

**Indirect Pressure**

**Tourniquet**

Z-Fold gauze should be packed into wound as deep as possible

CAT should be as distal as possible

Second CAT can be placed above it to gain

## Pelvis

At level of greater trochanters NOT ASIS

Binder to bare skin

Don't 'see-saw' binder up (potential to disrupt clot)

Enough pressure to return pelvis to normal alignment

If initial binder too high place second binder correctly before removing first

SAM Splint

T-Pod

## Long Bones

KTD (Kendrick Traction Device)/Prometheus Splint

Apply manual traction first

Pelvic binder on first if required

Ankle strap

Thigh strap

Pole

Tighten ankle straps (Green, Yellow, Red)

Thigh, Knee and calf straps

## Abdomen

Consider use of FAST

## Chest

Use large bore chest drains

Cardiothoracics 200 ml/hr

# Key Points of Massive Transfusion Protocol in AAH ED

**Blood Bank contact details:**
**Mon to Fri 9am – 5pm:** **Ext 334145/332044**
**Out of hours (after 5pm & weekends):** **Ext 331240**
**PORTERS contact details:** **#6173**

## Clinical staff Actions

- Massive transfusion protocol (MTP) can be activated by any staff member on behalf of a senior doctor.
- Initial call to Blood Bank must state: ***"We are calling the Massive Transfusion Protocol"*** OR if patient yet to arrive ***'Flying Squad Blood'.***
- Prompt call by clinical staff to Porters: ***"We are calling the Massive Transfusion Protocol"*** OR if patient yet to arrive ***'Flying Squad Blood'.***
- Group & screen sample **must** be taken and sent to lab immediately, if a sample is not already in blood bank.
- Keep a single designated coordinator and telephone number to liaise with blood bank.
- Only open sealed transport boxes of blood components when required – paperwork on outside!
- Inform blood bank and porters when deactivated.
- Return any unused components to blood bank as soon as possible.

## Blood Bank (BB) actions

**IF VALID SAMPLE AVAILABLE IN BLOOD BANK**

- 6 RBCs dispatched (Group specific).
- 4 FFP will be dispatched on thawing (approx. 20 mins).
- 2 Platelets – available 1 hour after activation of protocol – Lab will inform clinical team of platelet arrival from NIBTS.
- On request a second set of 6 RBCs will be issued.
- A further 4 FFP and 2 units of Cryoprecipitate will be prepared and issued only on request.

**IF NO PATIENT SAMPLE AVAILABLE IN BLOOD BANK (NB: Transfusion sample must be taken before any transfusion.)**

- 2 RBC O RH D Neg. dispatched.
- 2 AB FFP will be dispatched on thawing (approx. 20 mins).
- On receipt of sample a further 4 units of group specific RBCs and 2 FFP will be issued/thawed.
- 2 Platelets – available 1 hour after activation of protocol- Lab will inform clinical team of platelet arrival from NIBTS.
- On request a second set of 6 RBCs will be issued.
- A further 4 FFP and 2 units of Cryoprecipitate will be prepared and issued only on request.

## Flying Squad Blood for ED

- Ensure group and screen is taken and sent to Blood Bank immediately.
- **2 units of O Rh D NEG.** in a sealed box labelled, "Flying Squad", will be dispatched.
- Only open box when ready to transfuse to patient – The units have no patient details – these must be added, when known, to the pink traceability form.
- When patient is assessed inform blood bank of further requirements – MTP or cross match. Blood bank will require minimum patient identification details (Unique Identification number& gender).
- Inform porter of revised situation.

**Return any unused O Rh D NEG units and pink traceability forms of used units to Blood Bank immediately.**

## Appendix 4

## Octaplex Emergency Stock (Resus)

- Only to be used in case of life threatening bleed for patients on anticoagulant therapy.
- For any other purpose, please seek advice from the consultant haematologist and request directly from blood bank.
- Pack constitutes 6 boxes. Each box is a dose of 500iu. The **maximum dose** for any patient is 3000iu.
- Dose should be calculated dependent on the patient's weight and anticoagulant history.
- If the patient is on warfarin a current INR (within last 48hrs) should be used to calculate the required dose.
- Once this pack is opened paperwork should be completed for any boxes of Octaplex used and returned to blood bank with any remaining product. Once returned a new pack of 6 boxes will be re-issued to be held in A&E.
- Product must be stored in Resus medicine fridge at all times until required for use.

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## Octaplex Emergency Stock (Resus) Traceability Form

Product Issued: Octaplex Amount /Volume Issued: 3000iu / 6 boxes

Batch No.: L849C261 Expiry Date: 11/2021 BMS: (Signature) J. Murray Date: 28.6.19

If any of the Octaplex stock is used please attach a patient identification label (addressograph) to the pink traceability slip attached to each box used and complete the required information below:

| Patient Details (Name, DOB, Hospital/H&C no.) Addressograph label may be used. | Reason for Use | Patient on Warfarin? (yes/no) | Patient on NOAC (non oral anticoagulant )? Which type? | Patient's weight (kg) |
|---|---|---|---|---|
| | | | | |
| | Print Name of Authorising Consultant | Patient's INR | Amount Given iu | No of boxes given |
| | | | | |

**To calculate dose required -** If the patient has an **INR <4, 15iu/kg** Octaplex should be given
If the patient has **INR >4, 30iu/kg** Octaplex should be given
If the patient is on **NOAC therapy 40iu/kg** Octaplex should be given

**Traceability of blood and blood products from donor to recipient is a legal requirement. Documentation at all stages is mandatory.**

*This is a controlled document (printed on blue paper) and must not be copied or distributed without authorisation. A complete audit of the revision and approval of this document can be found on Q-Pulse.*

## 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*** *on ambulance stretcher* by most experienced doctor in EMERGENCY DEPARTMENT IMMEDIATELY. If AAA is still suspected:**
- **Vascular Reg contacted by ringing RVH.**
- **Patient taken to A-Block Recovery RVH** for Vascular Assessment IMMEDIATELY**

***They will give alternative contact details if necessary**

****ECG should usually be done as well**

⬇

- **Doctor to accompany patient**
- **Give 100% 02**
- **Give Morphine + Metaclopramide in iv aliquots**
- **Do not give iv fluids unless unconscious**

***Maximum time in Emergency Department is ten minutes – longer delays will require explanation!***

***Target call-to-surgery is 60 minutes maximum***

# Chest pain – suspected myocardial infarction and acute coronary syndromes, (see also Thrombolysis)

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 – referral for PCI within 15mins is the goal.

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***

**Should I admit to Cardiology? (Modified AEP Criterion 1)**
**Patients presenting to the emergency department with chest pain should be admitted to a cardiac unit if they have a history highly suggestive of acute coronary syndrome**
**ie pain *typical of angina pectoris* that is**
**(1) 1 new-onset within the preceding 5 DAYS or**
**(2) at rest within the preceding 5 DAYS or**
**(3) crescendo angina (increasing frequency and severity)**
**(Prolonged pain associated with cold sweat, faintness, nausea & vomiting or a sense of dread is highly suggestive of acute myocardial infarction).**

**OR**

**Should I admit to Obs? (Modified AEP Criterion 14)**
**Patients with an atypical but *suspicious* history and with no acute or dynamic ECG changes (see below) may be admitted to the Obs ward to rule out significant event (use the proforma).**

## ECGs

Now look at the patient's ECG & compare with any previous ECGs ASAP. The triage nurse will have obtained an ECG within ten minutes of the patient's arrival in Emergency Department – you must is check this for lysis-infarct (1-3 below) straight away, recording initials & time on the ECG

**Ischaemic ECG changes:**
1. **ST elevation > 1small square in 2 adjacent leads = myocardial infarction:**
**( II, III,aVF = inferior I, aVL, V2-6 = anterior)**
2. **LBBB = assume anterior myocardial infarction if new**
3. **Profound ST depression V1-3 +/- Tall R-wave in V1 = posterior myocardial infarction**
4. **Tall peaked T-waves with early slurring of ST segment= ?hyperacute ischaemic ECG: GET ADVICE**
5. **Any other ST segment depression("NSSTTW") = assume Acute Coronary Syndrome unless present on old ECGs**

**HISTORY IS ALWAYS MORE IMPORTANT THAN ECG> IF THE ECG IS NORMAL BUT THE HISTORY SUGGESTIVE REPEAT AFTER 30 MINS.**
Remember that pericarditis and a variety of other medical conditions can cause ST segment change: the history should fit the ECG!

## TREATMENT OF ACUTE CORONARY SYNDROMES

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

- Continuous ECG monitor, SaO2, NIBP
- NL spray +/- Buccal Suscard (if SBP>110)
- Soluble Aspirin 300 mgs orally

Some patients may require diamorphine for pain relief and this should be given with an anti-emetic. (metoclopramide)
Patients with ECG changes or HIGHLY suggestive history should also receive Enoxaparin (1mg/Kg)

**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.

**NOT ALL CHEST PAIN IS CARDIAC!!!!**

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

**Musculoskeletal pain is the commonest**

take a good history!--did the patient undertake strenuous activity eg 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 (but ~15% of patients with acute mi have marked chest wall tenderness!)

- **Upper GI –GORD, Acute Cholecystitis, Pancreatitis**
- **Stress, Hyperventilation**
- **Chest infection**
- **Rib fractures eg cough fracture**
- **Pneumothorax**
- **PE (use Canada score)**
- **Herpes Zoster- dermatomal**

**THROMBOLYSIS (see previous section: Chest Pain)**

## *…in the Emergency Department!*

This is rarely given in modern practice although may be considered in exceptional circumstance eg sudden cardiac arrest, please discuss with the consultant in charge of the shift.

## Acute Left Ventricular Failure

*(Dia)morphine as soon as possible*
Sometimes Emergency Department doctors fail to recognise LVF!

**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 with 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

# Thrombo-embolic Disease

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

## 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 02 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.

**Step One: Clinical Assessment of a patient with suspected PE prior to Canadian scoring**

Start with HISTORY. Acute pulmonary embolus is often a difficult diagnosis as signs are often non-specific or unreliable. Patients often complain of dypsnoea, pleuritic chest pain or collapse with shock in the absence of other causes.
97% of patients have one of the following

1. Dypsnoea
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).

An 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 atelectatsis / 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 / O2 sat should be measured: Low O2 saturation or PO2 increases suspicion in the absence of alternative diagnosis but normal oxygenation does not exclude PE. Comparing ABGs with and without O2 mask is not helpful.

**StepTwo: 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** |
| **Pulmonary embolus *as likely as or more likely than* an alternative diagnosis** | **3.0** |

| Score | Pre-test Probability of PE |
|---|---|
| **<2** | **low** |
| **≥ 2** | **Medium to high risk** |

**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 < 350ng/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 > 350mg/ml will probably 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.

**Pulmonary Embolism Severity Index (PESI)**

| Predictors | Points assigned |
|---|---|
| Age | Age in years |
| Male sex | +10 |
| Cancer | +30 |
| Heart failure | +10 |
| Chronic lung disease | +10 |
| Pulse ≥ 110 /min | +20 |
| Systolic blood pressure < 100 mmHg | +30 |

| | |
|---|---|
| Respiratory rate ≥ 30/min | +20 |
| Temperature < 36°C/ 96.8° F | +20 |
| Altered mental status (Disorientation, lethargy, stupor, or coma) | +60 |
| $O_2$ Saturation < 90% on Room Air? | +20 |

Risk Class I (Very low): Points≤ 65; Risk Class II (Low): Points 66-85; Risk Class III (Intermediate): Points 86-105; Risk Class IV (High): Points 106- 125; Risk Class V (Very high): Points ≥ 126

Risk Class Ⅰ-Ⅱ (Low): Points≤85; Risk Class Ⅲ-Ⅴ (High): Points＞85

### Step Four: Treatment Pending Further Investigation

**HIGH RISK PATIENTS FOR SUB-MASSIVE PE SHOULD RECEIVE 1.5MG/KG ENOXAPARIN* SUBCUTANEOUSLY ASAP AND SHOULD BE ON Controlled O2, ECG, SAO2 MONITOR.**

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

## 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 ≥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.

## Deep Venous Thrombosis

THE GUIDANCE BELOW MUST BE FOLLOWED METICULOUSLY AT ALL TIMES OR THE CASE DISCUSSED WITH A MORE SENIOR DOCTOR.

**On the next pages you will find the following:**

- **Protocol for clinical examination to rule in or out DVT**
- **Protocol for investigation to rule in or out DVT**
- **Protocol for managing definite DVT**
- **Ensure Unprovoked DVTs are referred to DAU for ongoing valuation**

- ***Step One: Clinical Examination To Rule In Or Rule Out DVT : Canada Score***

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 – IRRESPECTIVE of Canadian Score.***

| | |
|---|---|
| **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, *prolonged CRT – arterial insuf*ficiency, 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 |

* PATIENTS REFERRED BY THEIR GP WITH A D-DIMER NEED TO COMMENCE THE PATHWAY FROM THE BEGINNING. *i.e. AN ED D-DIMER RESULT IS REQUIRED**

- ***Step Two: Investigations to Rule in or Rule Out DVT***

Patients with a very low probability score for DVT should NOT have D-Dimer but other causes of leg pain should be excluded. 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.

Patients with medium probability for DVT should have D-Dimer screening to determine the need for USS. High risk patients with elevated D-Dimer should have a second Doppler done in 1 week if the first test is negative in keeping with NICE guidelines.

| | **Medium Pre-test Probability** | **High Pre-test Probability** |
|---|---|---|
| **D Dimer < 250 ng/ml** | **NO USS** | **USS** |
| **D Dimer > 250 ng/ml** | **USS** | **USS** |

- **USS**

How to request an Ultrasound scan

1. If patient has attended during working hours, speak to an ultrasound radiographer who will hopefully scan on the day of attendance.
2. If patient attends out-of-hours or cannot be scanned immediately for some other reason follow 3-7:
3. If there is a contra-indication to community treatment with low molecular weight Heparin(see below) – admit.
4. If there is no contra-indication to LMWH, Start treatment with Enoxaparin 1.5mg/kg *subcutaneously daily giving first dose in Emergency Department (1/2 dose if after 5pm).
5. Make an arrangement for patient to be given subsequent daily doses via district nursing service, giving the patient sufficient Enoxaparin syringes to last until day of USS – IF NURSING MANAGEMENT CAN'T BE ARRANGED, BRING PATIENT BACK AT 10AM FOR DAILY SUBCUTANEOUS ENOXAPARIN* VIA THE OBSERVATION WARD NURSE. If you are doing this make sure that the patient's notes and details are given to the Obs ward staff
6. Give a Heparin information sheet to patient.
7. Arrange USS appointment for patient. There is an available USS appointment slot as shown each weekday for Emergency Department patients attending out of hours ONLY. If in hours arrange directly with the radiology department for a scan that day.

| | | | |
|---|---|---|---|
| Monday | 9.30 | 11.00 | 14.30 |
| Tuesday | 9.30 | 11.00 | ---------- |
| Wednesday | 9.30 | ---------- | 14.30 |
| Thursday | 9.30 | ---------- | 14.30 |
| Friday | 9.30 | 11.00 | ---------- |

Reserve one of these slots by writing the patient's name and number in the DVT diary and booking an appt on symphony. Order the Doppler on the PACS system. This is your responsibility. Give the patient an appointment card asking them to go to X-ray at the appointed time. If no slots are available within five days record the patient's name, number and telephone number at the foot of the next working day page in the diary and advise the patient that they will be telephoned with an appointment time. Pass the referral on to an ultrasound radiographer.

8. LMWH should be discontinued on all patients with negative USS. If a patient with a medium pre-test probability has a negative ultrasound, reassure and discharge. If a patient with a high pre-test probability

has a negative ultrasound, reassure but seek senior advice regarding a re-scan in 7-10 days time. Make a record on the Emergency Department flimsy.

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

- ***Step Three: Management of definite DVT***

If community management is contra-indicated – admit to Medicine.

**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/NOAC**
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:

Please See VTE Treatment with Apixaban for DVT/PE

- **Step Four: Unprovoked DVTs**

Following confirmation of unprovoked DVT, please ensure all patients are referred to DAU for ongoing evaluation.

Northern Health and Social Care Trust

# VTE TREATMENT WITH APIXABAN FOR DVT/PE

**EMERGENCY DEPARTMENT, ANTRIM AREA/CAUSEWAY HOSPITAL**

| Patient Addressograph | Allergies / Medicine Sensitivities |
|---|---|
| | No Known Allergies ☐ (please tick) or |
| | Medicine (generic)/Allergen Type of reaction |

**Step 1: All patients should be risk assessed before commencing any oral anticoagulant therapy- see 'Oral Anticoagulant Guidelines, Pg. 4' on trust intranet for advice.**

**Step 2: Contra-indications for Apixaban-** any tick should prompt staff to reconsider using Apixaban as unsuitable choice and to seek senior medical advice

| Patient related | Tick |
|---|---|
| Active bleeding | |
| Significant risk of major bleeding (recent GI ulcer; varices; recent brain, spine or ophthalmic surgery; intracranial haemorrhage; malignant neoplasm; aneurysm) | |
| Prosthetic heart value | |
| Pregnancy or breast feeding (ask patient if intention of getting pregnant in next 6 months) | |
| Age < 18years | |
| Hepatic Disease associated with Coagulopathy | |
| Severe renal impairment (CrCl<15ml/min). **Seek Consultant review if CrCl between 15-30ml/min** | |
| Active cancer/chemotherapy-**discuss with ED consultant** | |
| If co-prescribed with<br>**antiplatelets (NB if patient has stent, consult cardiology prior to stopping)**<br>**carbamazepine**<br>**dronedarone**<br>**HIV protease inhibitors**<br>**itraconazole**<br>**ketoconazole**<br>**other anticoagulant (except under specific circumstances of switching anticoagulant therapy)**<br>**phenobarbital**<br>**phenytoin (and fosphenytoin)**<br>**posaconazole**<br>**primidone**<br>**rifampicin**<br>**St. John's Wort**<br>**voriconazole** | |

**Step 3: Drugs cautioned with Apixaban-** any tick should prompt staff to seek senior medical advice

| Drug | Tick |
|---|---|
| NSAIDS | |
| Sulfinpyrazone | |

**Step 4: Baseline Bloods-** must check in ED prior to commencing Apixaban **(INR not required)**

| Blood result | Tick |
|---|---|
| U&E inc. eGFR | |
| LFTs | |
| FBP | |
| Coagulation screen | |

Prepared by ED Pharmacy Team. Last updated 13/03/19 Version 3

## For patients with an implantable ICD

Patients may attend the ED after their de fib has fired. For the stable patients perform baseline investigations including ECG, and BP and refer to cardiology for observation and interrogation of the device.

In some cases the Defib is misfiring and in those circumstances can be temporarily abated by placing a magnet over the device (contact CCU).

# Asthma – Adults (BTS guidelines next page)

## *Prompt Recognition and Aggressive Treatment*

**Signs of Severe asthma**

- Unable to speak in sentences?
- Peak flow < 50% predicted or best?
- Respiratory Rate >25/min?
- Pulse>110/min?
- SaO2 <92%?

**Features of a LIFE-THREATENING Attack**

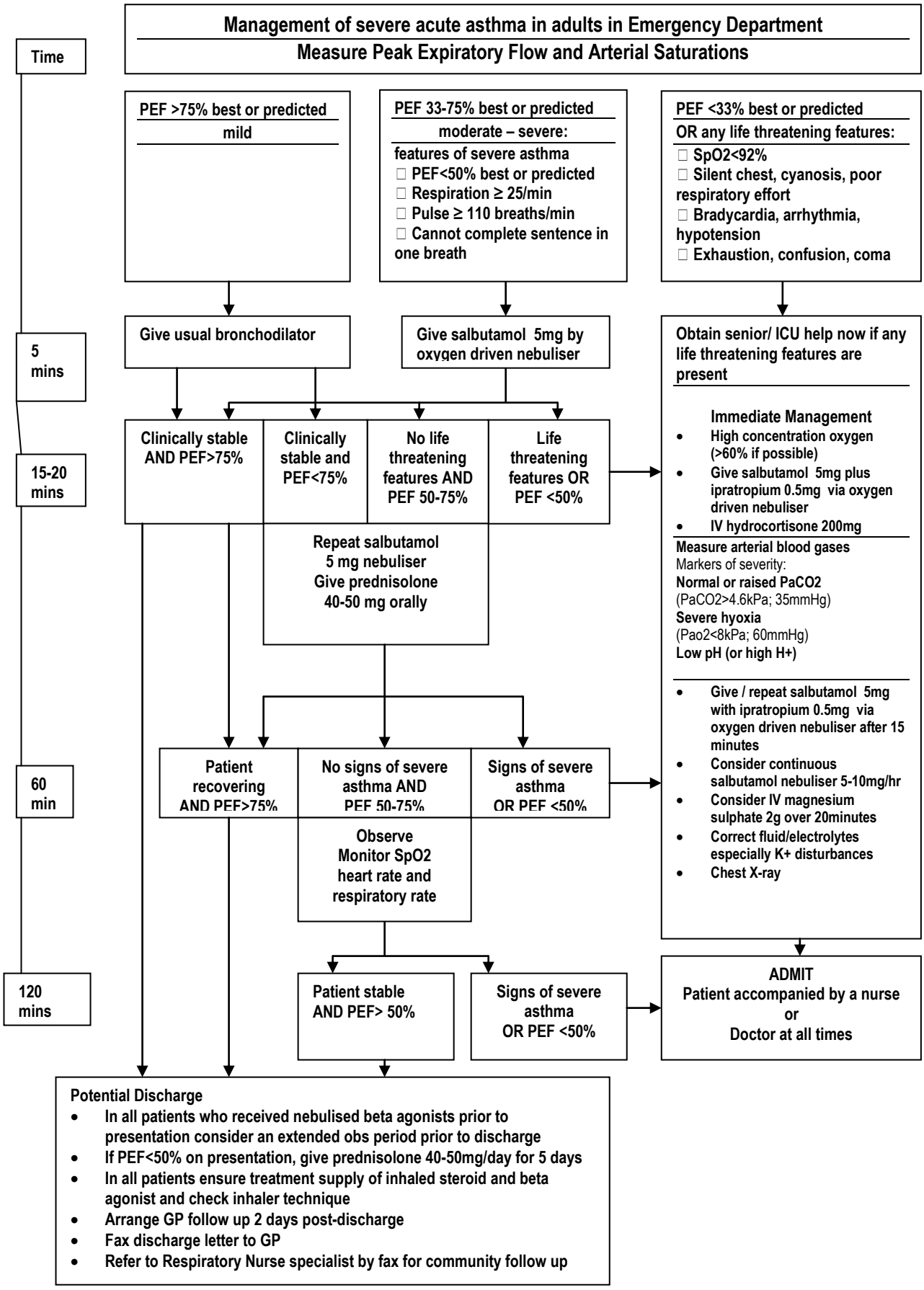
- Unable to speak?
- Silent chest, cyanosis, or feeble respiratory effort?
- Bradycardia or hypotension?
- Exhaustion, confusion, or coma?

**Clinical Assessment**

- Exclude tension pneumothorax by palpitation of trachea and auscultation
- Check blood gas (normal or high PaCO2 36mmHg+; PO2<60)
- Obtain urgent portable chest x-ray

**Treatment of severe & life-threatening attacks (BTS Guidance)**

- 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 hydrocortisone 200mg iv
- Give Oral Antibiotic (see Antibiotic Guidance) or iv if unable to swallow
- Give Magnesium 2g iv infusion over 20 minutes
- Consider Aminophyline iv or Salbutamol iv if poor inspiratory effort
- MONITOR CONTINUOUSLY


Management of severe acute asthma in adults in Emergency Department
Measure Peak Expiratory Flow and Arterial Saturations
Time
PEF >75% best or predicted
mild
PEF 33-75% best or predicted
moderate – severe:
features of severe asthma
PEF<50% best or predicted
Respiration ≥ 25/min
Pulse ≥ 110 breaths/min
Cannot complete sentence in one breath
PEF <33% best or predicted
OR any life threatening features:
SpO2<92%
Silent chest, cyanosis, poor respiratory effort
Bradycardia, arrhythmia, hypotension
Exhaustion, confusion, coma
Give usual bronchodilator
Give salbutamol 5mg by oxygen driven nebuliser
Obtain senior/ ICU help now if any life threatening features are present
5 mins
15-20 mins
Clinically stable AND PEF>75%
Clinically stable and PEF<75%
No life threatening features AND PEF 50-75%
Life threatening features OR PEF <50%
Immediate Management
High concentration oxygen (>60% if possible)
Give salbutamol 5mg plus ipratropium 0.5mg via oxygen driven nebuliser
IV hydrocortisone 200mg
Repeat salbutamol 5 mg nebuliser
Give prednisolone 40-50 mg orally
Measure arterial blood gases
Markers of severity:
Normal or raised PaCO2
(PaCO2>4.6kPa; 35mmHg)
Severe hyoxia
(Pao2<8kPa; 60mmHg)
Low pH (or high H+)
60 min
Patient recovering AND PEF>75%
No signs of severe asthma AND PEF 50-75%
Signs of severe asthma OR PEF <50%
Give / repeat salbutamol 5mg with ipratropium 0.5mg via oxygen driven nebuliser after 15 minutes
Consider continuous salbutamol nebuliser 5-10mg/hr
Consider IV magnesium sulphate 2g over 20minutes
Correct fluid/electrolytes especially K+ disturbances
Chest X-ray
Observe
Monitor SpO2
heart rate and
respiratory rate
120 mins
Patient stable AND PEF> 50%
Signs of severe asthma OR PEF <50%
ADMIT
Patient accompanied by a nurse
or
Doctor at all times
Potential Discharge
In all patients who received nebulised beta agonists prior to presentation consider an extended obs period prior to discharge
If PEF<50% on presentation, give prednisolone 40-50mg/day for 5 days
In all patients ensure treatment supply of inhaled steroid and beta agonist and check inhaler technique
Arrange GP follow up 2 days post-discharge
Fax discharge letter to GP
Refer to Respiratory Nurse specialist by fax for community follow up

# 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 ≥25 breaths/min
- Pulse ≥110 beats/min

**Life threatening features**
- PEF <33% of best or predicted
- SpO2 <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 hreatening attack:**
- Normal (4.6-6 kPa, 35-45 mmHg) $PaCO_2$
- Severe hypoxia: $PaCO_2$ <8 kPa (60mmHg) irrespective of treatment with oxygen
- A low pH (or high H+)

***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 $PaCO_2$
- Requiring mechanical ventilation with raised inflation pressures

## Immediate Treatment

- Oxygen 40-60% ($CO_2$ 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 2 g infusion over 20 minutes (unless already given)
- Give nebulised β2 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 β2 agonist and ipratropium 4-6 hourly

**IF PATIENT NOT IMPROVING AFTER 15-30 MINUTES:**
- Continue oxygen and steroids
- Give nebulised β2 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 β2 agonist or IV aminophylline or progression to mechanical ventilation

## Monitoring

Repeat measurement of PEF 15-30 minutes after starting treatment
- Oximetry: maintain SpO2 >92%
- Repeat blood gas measurements within 2 hours of starting treatment if:
  - initial $PaO_2$ <8 kPa (60 mmHg) unless subsequent SpO2 >92%
  - $PaCO_2$ normal or raised
  - patient deteriorates
- Chart PEF before and after giving β2 agonists and at least 4 times daily throughout hospital stay

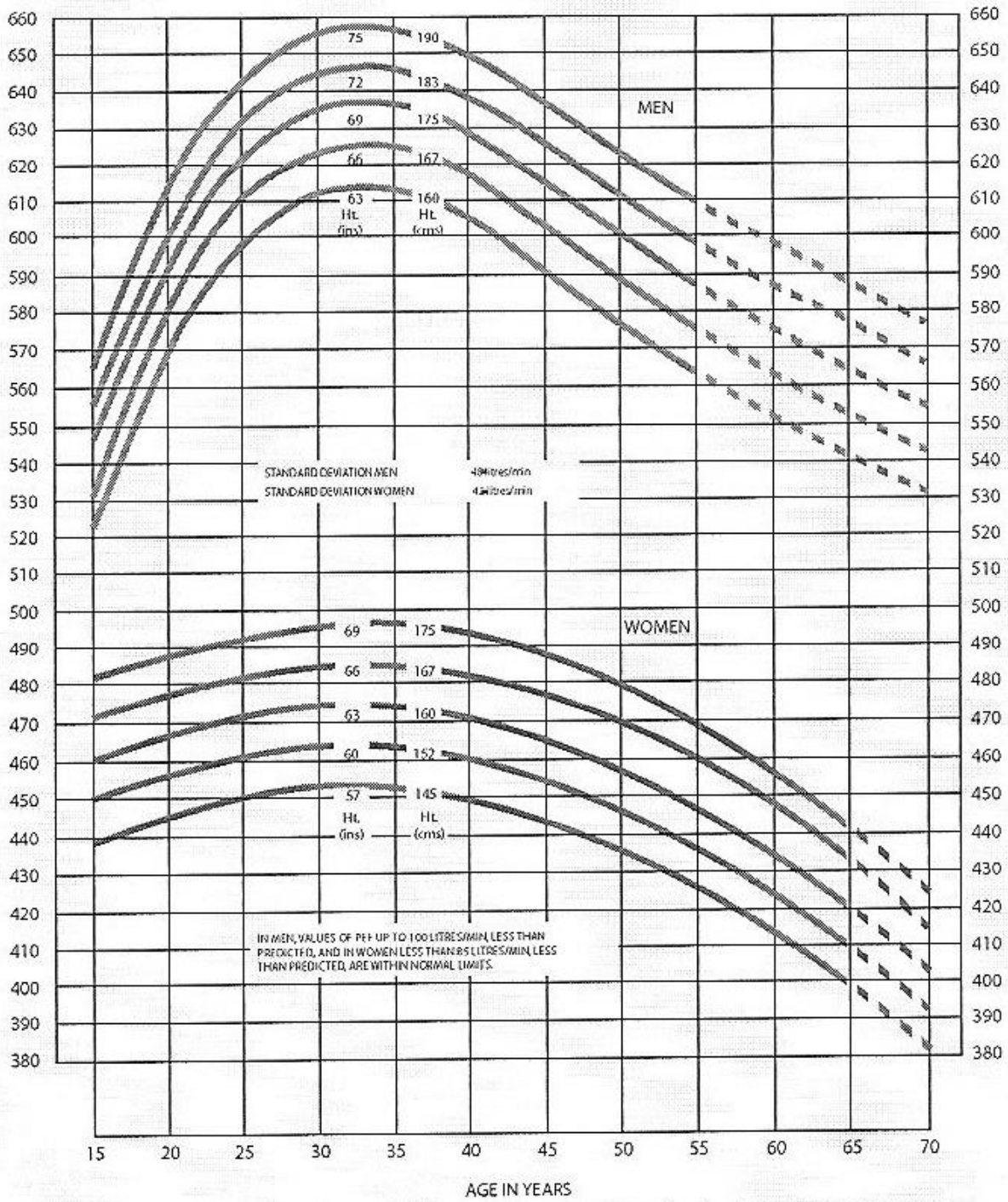
**Transfer to ICU accompanied by a doctor prepared to intubate if:**
- Deteriorating PEF, worsening or persisting hypoxia, or hypercapnea
- Exhaustion, feeble respirations, confusion or drowsiness
- Coma or respiratory arrest

## 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.

### *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: 30mg prednisolone for 3 days (to be stopped or stepped down by GP)
  - children: Prednisolone Soluble 1mg/kg for 1-5 days
- Determine why patient attended the Emergency Department.
- Patient should be reviewed by their GP or asthma nurse within 48 hours of Emergency Department attendance. Notes to document what to do if they worsen.
- Adult patients discharged and require follow up can be referred to community respiratory teams via email with brief case details ensure H&C number included
  Email to respiratory team.(insert antrim, midulster, whiteabbey or causeway depending on patients address) @northerntrust.hscni.net

## Chest Infection

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 a 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 ≤ 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 SaO2, pulse and responsiveness
- Check ABG at T=0 and T=30mins and adjust $O_2$ strength accordingly
- Give nebulised bronchodilators and repeat if necessary
- Give Prednisolone 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. A lot of these patients are well known to the department and to the respiratory team. "Why are they here? What is different?"

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 |
| SaO2 < 90% | No | Yes |
| Changes on chest X-ray | No | Present |
| Arterial pH level | ≥ 7.35 | < 7.35 |
| Arterial PaO2 | ≥ 7 kPa | < 7 kPa |

There are three options with COPD patients

**Home**
Arrange appropriate review (GP, community respiratory team, respiratory OPD)
Give clear instructions on correct use of medication and stopping corticosteroid therapy
For follow up refer to community respiratory teams or if in hours discuss with the rep nurse specialist on bleep #5727

**Home with Respiratory Enhanced Discharge Scheme (REDS) See table 2**
Mon-Fri, 9am-5pm.
Contact respiratory nurse specialist via switchboard

| Table 2. Criteria for REDS |
|---|
| Exacerbation of COPD |
| No Acute Hypercapnoeic Respiratory Failure (AHRF) |
| No consolidation on CXR |
| No *new* requirement for oxygen |
| OR SaO2 >90% on usual flow of oxygen if on LTOT |

**Medical admission**
Refer to the "take" SHO

COPD, Hypercapnia and Oxygen:

- All patients who require medically-supervised resuscitation should receive 100% oxygen via non-rebreather reservoir mask (NRRM).
- After the immediate resuscitation period, continuous oxygen therapy should only be given when prescribed by a doctor at the bottom of the flimsy. 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 PO2 >8 and PCO2< 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.*

## Management of Patients in Respiratory Failure

1. Each patient should have an Arterial Blood Gas (ABG) if:
    - SpO2 <93% Room Air
    - Abnormal Respiratory Rate
    - History of domiciliary Oxygen use
    - History of NIAS administered O2 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 PaCO2 > 6.5kPa
5. Referral for NIV should be made for
    - COPD patients with persistent respiratory acidosis.
    - LVF patients with pulmonary oedema and low saturations.

## Non-invasive Ventilation (NIV)

When to use non-invasive ventilation

Patients

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

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).

Clinical state

- Sick but not moribund
- Able to protect airway
- Conscious and cooperative
- Haemodynamically stable
- No excessive respiratory secretions
- Few co-morbidities

Premorbid state

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

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*
- Undrained pneumothorax*

# Pneumothorax

**<u>Tension pneumothorax</u> 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.**

<u>Primary* spontaneous pneumothorax</u> is the term used for a non-traumatic pneumothorax in a patient with no pre-existing lung disease, the management protocol is on the following page.

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. The management protocol for primary pneumothorax is given on the following page. After aspiration or in patients managed conservatively, patients should be recalled to the Emergency Department 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.

<u>Traumatic pneumothorax</u> is the term used for any pneumothorax of whatever size that follows injury to the chest. A chest drain should always be inserted following chest x-ray. Patients with chest trauma and sub-optimal x-rays should usually have chest drains prior to IPPV.

<u>Secondary* spontaneous pneumothorax</u> 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 aspiration if asymptomatic, age <50 and <2cm rim from the chest wall. Otherwise first line is a small chest drain (size 20-24) should be inserted.

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

## Management of Primary* Spontaneous 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*

100% Oxygen, ECG and SaO2 monitor

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Take the large bore venflon and attach 10 ml syringe

↓

Identify your aspiration site at the mid-clavicular line second intercostal space

↓

Inject 5ml of 2% Lignocaine into this region

↓

Insert the venflon while continuously aspirating until air starts to come out easily

↓

Detach the needle and syringe from the plastic cannula and attach 3 way tap and 50 ml syringe. Aspirate in 50ml aliquots expelling each aliquot by switching the 3-way tap off to the chest and on to the side-arm

↓

Stop aspirating when the patient begins coughing, when resistance is felt or when 2.5 litres of air have been aspirated

↓

Obtain a chest x-ray

↓

If the lung has totally or almost totally re-expanded, keep the patient resting for 4hours, then mobilise for 2 hours before discharging with advice to re-attend immediately SOS. If patient lives alone or far away, or if it is late keep in Obs ward overnight on high flow O2. Repeat CXR on day 2 post aspiration. If no success aspiration should be tried again.

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

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.

# 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

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

*ALL PATIENTS TO BE ADMITTED TO WARD WITH SUSPECTED ACUTE ABDOMEN SHOULD BE FASTING AND IV FLUIDS SHOULD BE ERECTED IMMEDIATELY.*

**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 equesting USS(X-ray dept) and admit to SSW or speak to O&G. 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. Recurrent attendances with biliary colic – admit and *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. Never disregard significant tenderness in RIF- re-evaluate if necessary. (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. If sick consider TMC – x-ray may be diagnostic. 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 & varices (see 'Shock')

Not all patients presenting with haemataemesis require admission. Use the guidelines given below to help you devise a management plan.

Patients may require "immediate" endoscopy if
- Ongoing bleeding and haemodynamically unstable

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 $O_2$ via NRRM, monitor and give iv protium. Notify Medical SHO (and surgical registrar if no GI physician on call) at once

Patients require admission to a medical ward for next available endoscopy if they have suspected haematemisis and ANY of the following apply:-
- they have had proved haematemesis in the past
- they describe any episode of faintness or dizziness since the onset of haematemesis
- a further episode of haematemesis is witnessed by the Emergency Department staff
- 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 low Glasgow Blatchford score with adequate home circumstances. Dispense a PPI and suggest this to the GP.

## Management of variceal haemorrhage

Get senior help bleep gastro registrar or surgical reg if out of hours

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 O2 sat >90%, uncontrolled bleeding or aspiration. Also consider central venous access in such circumstances
- Catheterise to monitor urine output
- Start iv Augmentin

- 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 crystalloid 1 litre of N. saline to begin with 0.9% normal saline
  - Aim for CVP 5-10mmHg (if central line present)

- Endoscopy
  - OGD should be performed when patient is rescusitated as best as possible
  - Variceal banding is treatment of choice for oesophageal varices

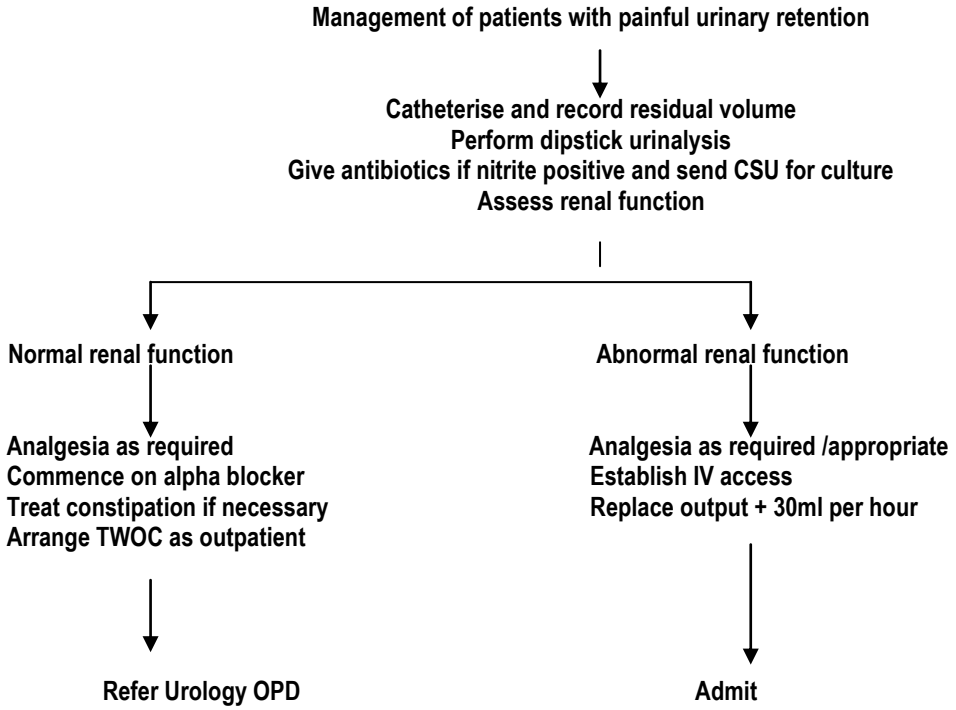
  Vasoconstrictors may be required
  - Give stat dose of terlipressin (Glypressin) as a 2mg iv bolus
  - Glypressin is then given 1-2mg, 4-6 hourly for up to 48 hrs

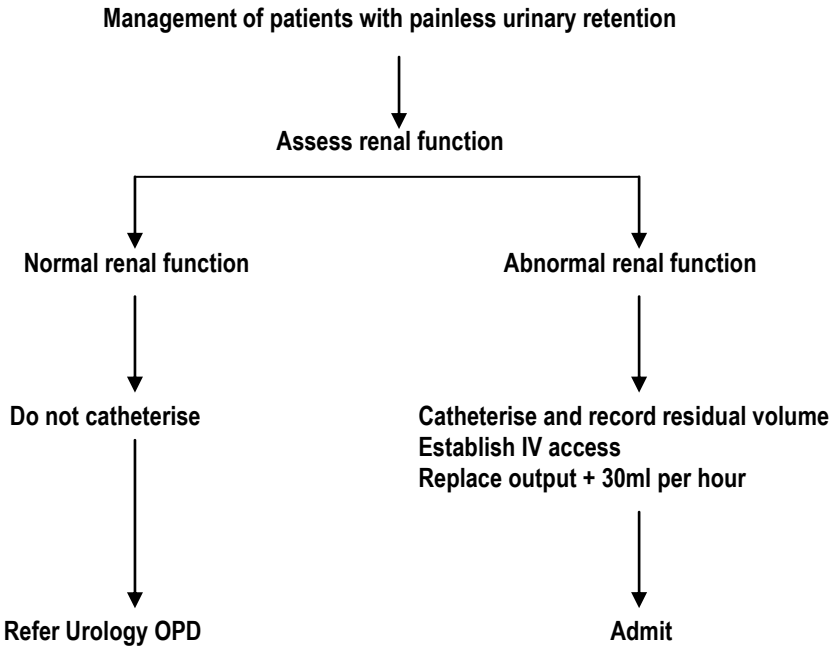
- Insert Sengstaken-Blakemore tube if there is uncontrolled bleeding and senior ED staff and anaesthetic staff are present
  - Intubate patient
  - Insert tube orally
  - Confirm tube is in stomach by aspiration and auscultation
  - Inflate gastric balloon with 250mls WATER
  - Secure tube at side of mouth with balloon pulled up against gastric fundus
    (Beware of pulling tube into oesophagus. Use Xray 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 Urinary Retention

*A proper discharge plan is vital if community treatment planned!*

## Urology referral is based on post code please ask secretarial staff for advice



## Renal colic

Patients with renal colic will have their temperature, urinalysis, abdominal signs and KUB recorded. Diclofenac is usually the analgesic of choice and most cases can be investigated via GP. Reconsider the diagnosis if there is no haematuria.
Patient should be admitted to obs ward if:

- 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 >60years)
- Frail/ very elderly

If diagnosis confirmed by CTKUB refer to urology URGENTLY : If there are signs of back pressure, evidence of infection deranged renal function or pain not easing with medications given.
All other patients send written referral to the urologist on call.
Commence on an alpha blocker and dispense suitable analgaesia and advise to return if exacerbation of condition

If diagnosis not confirmed by CTKUB find alternative diagnosis.

## 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

If patient is unable to PU

- Catheterise with a 3 way catheter and record residual volume.
- Commence bladder irrigation with normal saline
- Admit patient to urology service (surgical if OOH)
- Commence on antibiotics if signs of sepsis
- X-match if anaemic/ haemodynamically unstable

Refer to Urology clinic if:

- Haemodynamically stable
- Not anaemic
- No evidence of sepsis
- Able to PU
- Not on warfarin or equivalent

## 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.

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

- 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 scan if pain had sudden severe onset of symptoms

## Advice for ED doctors regarding renal patients

If a patient known to the renal unit attends please consider asking at an early stage for expert advice from one of the renal consultants particularly if the presentation relates to a complication of their renal disease or the treatment of this. Examples of this would include:

- 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.

Local renal physicians may be contacted by bleep during working hours and via switchboard at other times. 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 recently become unwell immediately after haemodialysis in 3 of the 6 dialysis units in Northern Ireland. Although this is normally very uncommon a total of six patients have now been affected since September 2008.
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. (See attached patient letter)
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

### Aetiology

At present the cause of this problem is not known. Similar cases have occurred in the past in dialysis units throughout the world and for a variety of reasons. The Belfast Health and Social Care Trust is making every effort to identify the cause together with other affected Trusts in Northern Ireland.

### 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 CREST 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
    - Hemolytic 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 A&E Departments raising the issue of haemolysis should be seen promptly and 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.

### 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, nonsteroidal anti-inflammatory agents, heparin)

B) Transcellular shift (intracellular to extracellular compartment)

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

Increase circulating potassium - Exogenous or Endogenous
• Exogenous (potassium supplementation)
• Endogenous (tumour lysis syndrome, rhabdomyolysis, trauma, burns)

C) 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

### 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+ 5.5 - 6.0 mmol/L)
• moderate (K+ 6.1 - 6.9 mmol/L ) or
• severe (K+ 7.0 mmol/L )
or if ECG changes or symptoms (muscle weakness or flaccid paralysis palpitations, paresthesias) occurring at ANY level of serum potassium ³5.5mmol/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.

**Is urgent treatment required?**

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

If despite the above measures the potassium remains greater than 7mmol/L or if pathological ECG changes/symptoms persist, the renal team should be contacted to arrange urgent dialysis if appropriate.

# 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 ≥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)

GAIN
GUIDELINES AND AUDIT IMPLEMENTATION NETWORK

## Patients with Mental Health Problems

Always use a calm empathic approach to patients with mental illness –they respond best to someone who listens to them properly. 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.

Your first task is to exclude psychosis:

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).

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 –eg serial 7s
- Identifiable cause of confusion eg alcohol or drug misuse, sepsis, head injury, metabolic or electrolyte disturbance

Your third task is to decide if the patient poses an immediate threat to themselves or other people.

Is there a reasonable suspicion that he/she may harm someone?

All patients presenting with self harm (either self poisoning or self cutting etc) will require an early suicide risk assessment. This is carried out by the Emergency Department doctor and the patient recorded as “high” or “low” risk. No one can carry out an adequate psychiatric assessment on an intoxicated patient but you are still obliged to carry out a risk assessment. It is comforting that virtually all self-harming patients become less suicidal as they sober up.

High Risk Features following self harm

- Patient expected they would die and made no provision for own safety
- Firm Evidence of planning
- Patient still clearly articulates suicidal plans (note that some patients with personality disorder also do this)
- Patient has easy access to choses means of suicide
- May be uncommunicative, refusing to discuss self harm event
- Unwilling or reluctant to accept medical treatment
- APPEARS ACUTELY DISTURBED, PSYCHOTIC OR INAPPROPRIATELY CALM

If high-risk patients leave before examination or treatment you must notify the Police that they have left contrary to advice and may be at risk of further self harm. They will probably need to be detained under Mental Health Order.

If you conclude that the patient has a non-organic psychosis that puts him/herself or others at immediate risk the patient should be detained form psychiatric assessment under the Mental Health (NI) Order 1986 (see below). He or she MUST be discussed with the MHLS team and if formal section required they will help you to facilitate this

DO NOT KEEP PATIENTS WHO ARE MEDICALLY FIT FOR DISCHARGE IN ANY PART OF EMERGENCY DEPARTMENT OR ANTRIM OVERNIGHT TO AWAIT MENTAL HEALTH ASSESSMENT – SEEK EMERGENCY DEPARTMENT SENIOR HELP IF NECESSARY

## 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 CAPACTIY 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

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

ie the questions in mind are:
Is there any possible evidence of mental illness?
AND
Is there a substantial risk of serious physical harm to the patient or others?

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

**HOW TO ARRANGE A MENTAL HEALTH ORDER ASSESSMENT**

Always discuss with the duty psychiatrist in Holywell (2nd on call) or the Emergency Department consultant on-call. To obtain compulsory psychiatric assessment Forms One and Three must be completed.

Form One

An application for compulsory admission needs to be made by either the *nearest relative* (on form 1) OR an *Approved Social Worker*) (on form 2). Guidance on who is considered to be the "nearest relative" is on the back of Form 1. You must discuss the case in private with the relatives and explain what is needed and take them through the form. An approved social worker can be contacted by our hospital SW team or, out-of-hours by Ambulance Control.

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 deputy 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 Homefirst Community Trust, The Cottage, Ballymena (Holywell Hospital is part of that 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 Act 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.

As already discussed we have access to mental health professionals 24hr a day via the MHLS team refer via 336208. The MHLS team will also regularly round in the ED to look for any suitable patients for them. Dual medical and psychiatric assessment is encouraged, that is to say there is no expectation that medical treatment should be complete prior to psychiatric assessment commencing.

If high risk patients leave before examination or treatment you must notify the Police that they have left contrary to advice and may be at risk of further self harm. They will probably need to be detained under Mental Health Order.

## Drug and Solvent Abuse (see also 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 - 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.

## MENTAL HEALTH PROBLEMS

### 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.

National guidelines for:

- the investigation/management of iv drug abusers who present with systemic sepsis or marked local reactions
- management of ivda in general

are available in the computer room. The former were produced after a number of unexplained deaths involving ivda patients in Glasgow and Dublin.

### The Violent Psychotic Patient (see Section One 'Arguments', Legal Issues and Mental Health Act)

- Refer to the hospital and college of emergency medicine protocols on rapid tranquilisation

You must take reasonable steps to exclude a physical cause for violence/confusion – consider hypoxia, metabolic upset, CNS lesion etc

### Alcohol Withdrawal Syndrome and Dealing with the Problem Drinker

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 ie 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
- Refer patients to RAID team for a brief intervention and onward referral to Community addictions team

Guideline for the Community Management of AWS

- Identify the patient's suitability using pre-admission assessment flowchart
- Document baseline examination for WKS: confusion?, ataxia?, opthalmoplegia?: if present admit SSW
- Carry out brief intervention using FRAMES method (box below)
- Dispense maximum of chlordiazepoxide 15mg qid for two days, chlordiazepoxide 10mg 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

Guideline for the initial observation ward management of patients with alcohol dependency (admitted for other reason)

- Identify patients suitability using pre-admission assessment flowchart on next page
- Place on GMAWS chart
- Prescribe chlordiazepoxide 40-60mg orally at *6,12,6 & 12* (if necessary seek advice re dose)
- Prescribe Chlordiazepoxide 30mg orally prn hourly for persistent agitation
- Prescribe lorazepam 1-2.5mg iv prn 2 hourly with close medical monitoring for severe breakthrough agitation requiring restraint
- Resistant severe agitation may require administration of phenobarbitone on an anti-psychotic preparation – speak to a consultant
- Advise that some sleep disturbance is inevitable during the recovery process. Minimise risk of delirium by avoiding monitors, drips and disturbances overnight
- Prescribe Pabrinex Twin Amps three times daily by iv infusion (NB Check for HYPOGLYCAEMIA & correct <u>after</u> Pabrinex given)

BRIEF INTERVENTION

- <u>F</u>EEDBACK: of your assessment of the situation
- <u>R</u>ESPONSIBILITY is the patient's alone
- <u>A</u>DVICE to stop drinking
- <u>M</u>ENU of options to help
- <u>E</u>MPATHY ie. Show warmth and understanding
- <u>S</u>ELF-EFFICACY ie encourage the patient to believe that abstinence or reduction is achievable

## ALCOHOL & 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 of 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.

# DEPARTMENT OF EMERGENCY MEDICINE HELPLINE 9446 6446

## FAX TO GP FOR COMMUNITY DETOXIFICATION FROM ALCOHOL

***Name:*** _____ ***Address:*** _____

***Date of Birth***: _____ ***ED Number***: _____

***Date of Attendance***: _____

Your patient attended Antrim Emergency Department today with a primary detoxification request due to prolonged heavy alcohol consumption. He/she did not fulfil our inpatient detoxification criteria* and he/she has been discharged with the following medication:-

☐

| | |
|---|---|
| Day One | Chlordiazepoxide 30mg qid |
| Day Two | Chlordiazepoxide 20mg qid |
| Day Three | Chlordiazepoxide 10 mg qid |
| Day Four | Chlordiazepoxide 10mg bd |
| Day Five | Chlordiazepoxide 10mg nocte |

☐

| | |
|---|---|
| Day One | |
| Day Two | |
| Day Three | |
| Day Four | |
| Day Five | |

☐ 3

| |
|---|
| Vitamin Supplements<br>Thiamine 100mg bd for 28 days<br>and<br>Ascorbic Acid 500mg mane for 14 days |

Your patient has been advised to contact your surgery to request a review around 48 hours after discharge from the Emergency Department. Please consider referring to the Addictions Team for follow up. He/she has also been advised to attend either Antrim Emergency Department or yourself should there be any further problems.

Additional Comments _____

_____

**Signed** _____ **ED Doctor** _____ **PRINT**

***Always fax this with Emergency Department Detox Fax Cover Sheet and retain the original in the patient's Emergency Department notes***

# Pre-Admission Assessment for patients requesting detoxification from alcohol

**DTs/Severe AWS****
**Delirium Tremens is alcohol withdrawal complicated by disorientation, hallucinations or delusions associated with autonomic overactivity. It can be reliably identified using the CIWA score.**

**Evidence of DTs/Severe AWS?****
► GMAWS>8

Y → Admit medically

N

**Breath or Serum Alcohol zero?**

N → Psychosocial crisis intervention if necessary

Y

**Does patient show genuine interest in reducing alcohol intake in the long term?**

N → Psychosocial crisis intervention if necessary

Y

**AGREE GOAL WITH PATIENT**

**REDUCTION IN ALCOHOL INTAKE**

- ► Give encouragement
- ► Advise patient to scale down alcohol intake and see GP within 5 days

**ABSTENTION***

Plan medically assisted abstinence

*Absolute indications for abstention
- ► Alcohol-related organ damage
- ► Severe dependence
- ► Significant psychiatric disorders

Relative indications
- ► Epilepsy
- ► Social factors

Any contraindication to home detox?

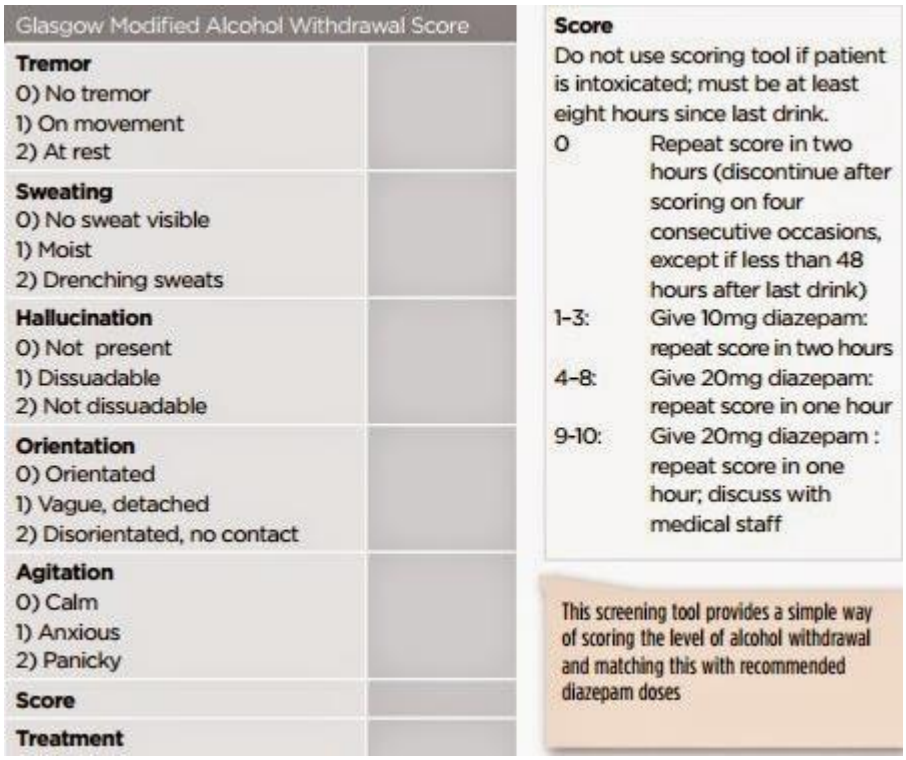
N → Refer to GP using community AWS Protocol RAID assessment

Medical Contraindications?
- ► Acutely confused or hallucinating
- ► Definite history of seizures
- ► Severe vomiting and diarrhoea
- ► History of complicated withdrawal
- ► Significant co-morbidity

Y → Admit Medically

Psychosocial Contraindicaitons?
- ► At risk of suicide
- ► Severe dependence and unwillingness to be seen daily
- ► Acute psychiatric illness
- ► Multiple substance misuse
- ► Unsupportive home environment

Y → Refer to RAID team



| Glasgow Modified Alcohol Withdrawal Score | |
|---|---|
| **Tremor**<br>0) No tremor<br>1) On movement<br>2) At rest | |
| **Sweating**<br>0) No sweat visible<br>1) Moist<br>2) Drenching sweats | |
| **Hallucination**<br>0) Not present<br>1) Dissuadable<br>2) Not dissuadable | |
| **Orientation**<br>0) Orientated<br>1) Vague, detached<br>2) Disorientated, no contact | |
| **Agitation**<br>0) Calm<br>1) Anxious<br>2) Panicky | |
| **Score** | |
| **Treatment** | |



We use chlordiazepoxide instead of diazepam GMAWs charts are available on symphony

## ED management of suspected bodypackers / bodystuffers

*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 Bed 10 in observation ward.

## The Unconscious Patient (see also Head injury, Shock, Stroke, Poisoning, Status Epilepticus)

- 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 ex.)
- Assess depth of coma using Glasgow Coma Scale. Involve anaesthetist if GCS<11
- 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 E if hyperpyrexic) |
| | Alcohol |
| | C.O. |
| (4) Environment | Hypothermia |
| | Hysteria |

- If no diagnosis after clinical examination, blood tests and x-rays, or if focal neurology consider urgent CT scan

## Status Epilepticus– Adults (see also Unconscious Patient)

***Ask for senior advice***

- ABC + oxygen by NRRM
- Check blood glucose
- IV diazepam up to 10 mg slowly iv
- Always give phenytoin 15mg/kg by iv infusion (unless patient is on this already) (max 1g)
- Consider 'Pabrinex' slow iv
- 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)

*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 <u>uncommon</u> cause for transient loss of consciousness.)

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 stressful situation. 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 observation or 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.

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.

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.

**3. Loss of consciousness/ loss of or altered awareness unlikely to be unexplained syncope and high risk of re-occurrence**
Factors indicating high risk:
(a) abnormal ECG
(b) clinical evidence of structural heart disease
(c) syncope causing injury, occurring at the wheel or whilst sitting or lying
(d) more than one episode in previous six months.
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
- unconsciousness for more than 5 mins.
- amnesia greater than 5 mins
- injury
- tongue biting
- incontinence
- remain conscious but with confused behaviour
- headache post attack

**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.

All patients should have their medication list scrutinised as well as thorough CVS and NS examination, including erect & supine BP (wait 1 min and 3 mins to check erect BP) and auscultation of the neck. An ECG must be recorded – any arrhythmia or a QTc > 460mseconds is an indication for cardiac referral. Follow up investigations – either 24hour tape or CT Brain/EEG etc can be requested via Emergency Department consultant depending on the working diagnosis. Patients with evidence of structural heart disease or with exertional syncope have a higher incidence of underlying disorder Young adults who have a combination of recurrent syncope along with additional other cardiac symptoms such as palpitations, dypsnoea or chest pain have a high index of suspicion for a serious underlying condition even with abnormal ECG –admission to Obs on a monitor, or cardiac referral is usually warranted. Patients who have had a first seizure must be admitted to the Obs ward but epileptic patients who are fully recovered can be discharged if supervised.

## Headaches (see Meningococcal disease)

- ***Discuss all ill patients with a senior doctor.***
- ***A high risk symptom!***

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 –maximum intensity within one hour,*
*Prolonged headache,*
*Vomiting more than once or*
*Fainting/collapse*

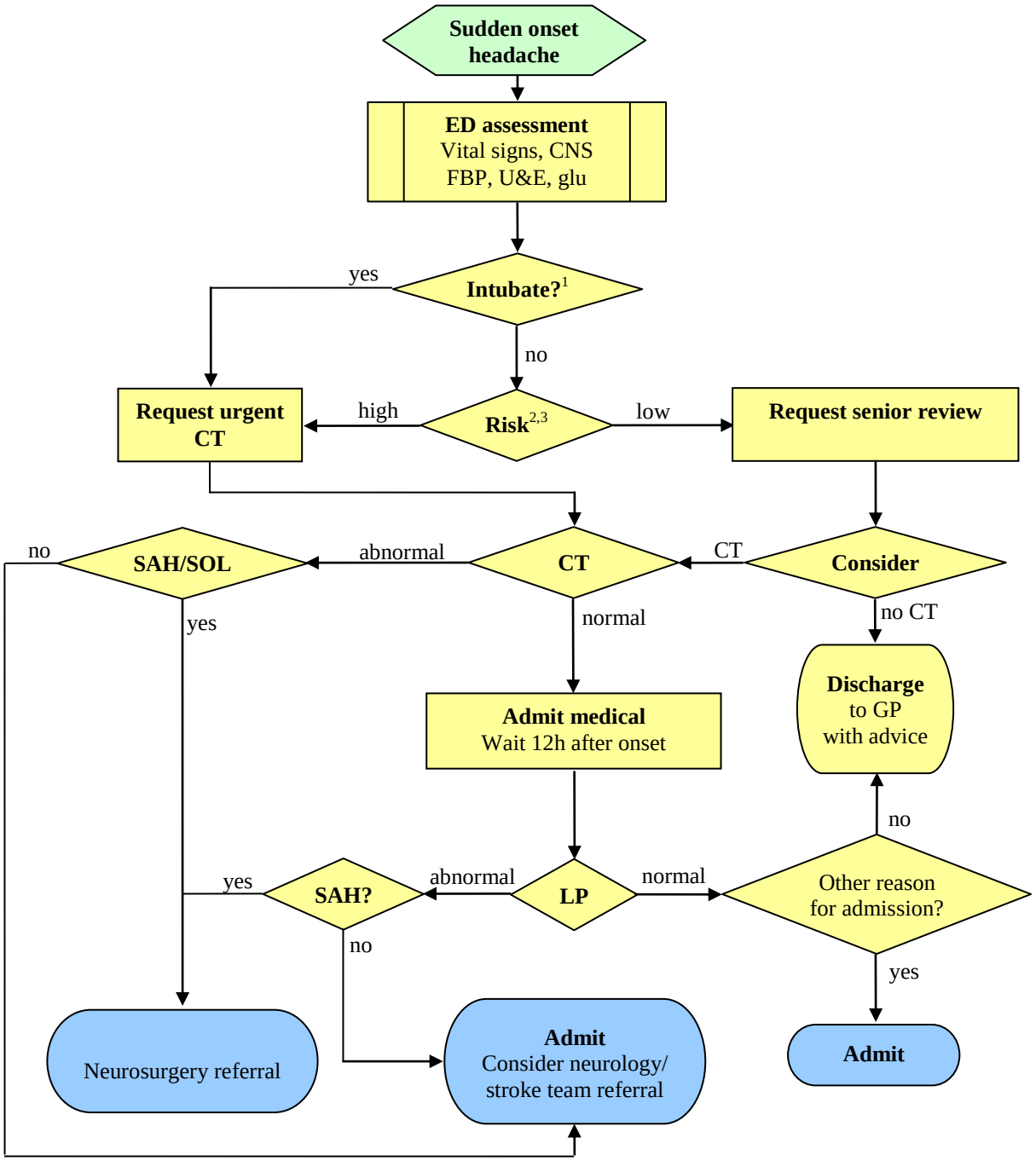
*These 'Red Flag' symptoms are very significant – CT Scan is usually required. Fever and Meningism are also strong risk factors for a serious cause.*

| | |
|---|---|
| Don't miss: | Sub-arachnoid haemorrhage (usually sudden onset; reaches maximum intensity within 60 mins)<br>Meningitis (fever and/or rash)<br>Encephalitis (fever, ataxia, drowsiness/confusion)<br>Raised ICP (CNS signs or papilloedema, typical symptoms)<br>Temporal arteritis (older patients -check ESR if age >60) |

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. 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 for lumbar puncture.

## Sudden Onset Headache Pathway




**1. Intubate** if any of: airway compromise / inadequate respiration / GCS≤8 (consider if <12), hypoxia ($SaO_2$<92% on supplemental $O_2$ or $pO_2$<8kPa), hypercarbia ($pCO_2$>5.5kPa)
**2. High risk =** any of: GCS<15 / persistent vomiting / previous SAH / fits / neck rigidity / focal neurological signs. **If deteriorating request immediate CT**.
**3. If on Warfarin** check INR and request **immediate CT**. If INR>1.5 and +ve scan: reverse as per acute Warfarin protocol.

# Stroke

- ***A time dependant condition***

## HYPERACUTE STROKE

There is now good evidence that emergency lysis of hyperacute THROMBOTIC stroke within 4 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 ie work through the contra-indication checklist, speak to the consultant, set up the scan while resuscitation is getting underway; remember that a considerable portion of the 4 hour window may have elapsed by the time the patient reaches you.

Assessment of patients should be rapid with the stroke team.
Many of these patients will be pre alerted by the NIAS in these cases bleep the stroke team by dialling 6000 and ask for the stroke team BEFORE the patient arrives in the ED.

For patients self presenting perform ROSIER SCORE and contact the stroke team if positive

**ROSIER SCORE**
Unsure if patient has had an Acute Stroke? – Use the Rosier Score
Rosier Scale Proforma

BM = Blood Glucose; BP = Blood Pressure (mm Hg); GCS = Glasgow Coma Scale; E = Eye; M = Motor;
V = verbal component
*If BM <3.5mmol/L treat urgently and reassess once blood glucose normal

1. Has there been loss of consciousness of 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)

Provisional diagnosis

☐ Stroke ☐ Non-stroke (specify) _____

**After care**

Patients require close observation and nursing and continuous monitoring following lysis. They should be moved to an appropriate bed as soon as possible. Blood pressure must be maintained below 180/105 mmHg during this period, and liberal use of drugs such as labetalol or sodium nitroprusside may be required – this must be consultant led. Any deterioration including headache, neurology, vomiting – contact the consultant immediately. Stop rt-PA. Send coag and cross-match sample. Arrange re-scan. D/W haematologist re emergency administration of cryoprecipitate and platelets.

**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**

They may also require and urgent CT scan as anti-haemorrhagic therapy ( see page83), antispasmodic and/or neurosurgical involvement may be indicated.

**URGENT CT SCAN?**

- **Diagnosis in doubt**
- **Suspected SAH**
- **Suspected hydrocephalus $2^0$ to CVA**
- **On warfarin or heparin (or coagulopathy)**
- **Acutely deteriorating**
- **>48 hours since onset**

**There are four evidence-based treatment interventions for acute stroke:**

- **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)***

## Transient Ischaemic Attack (TIA)

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.

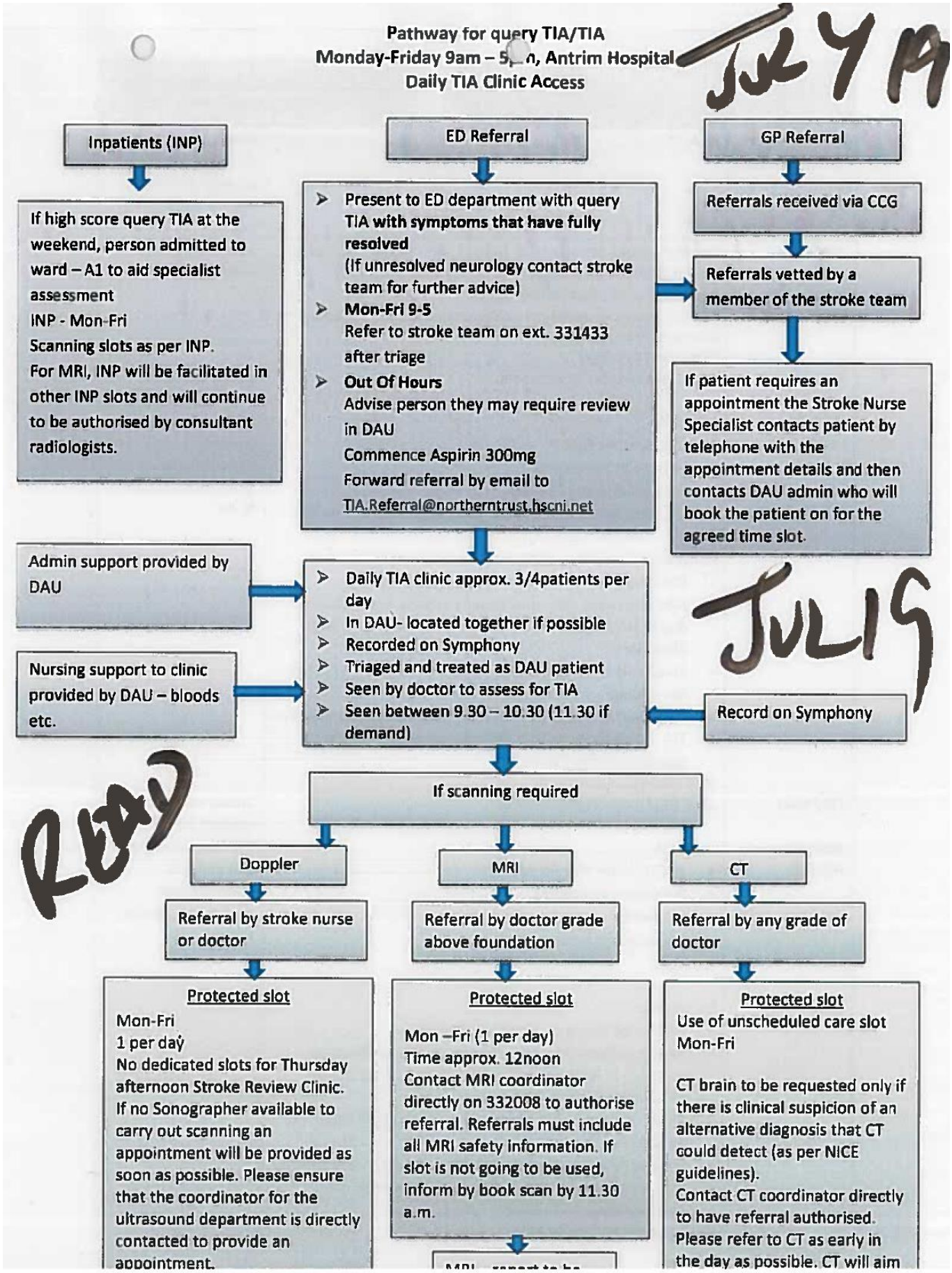
TIA is abrupt in onset, focal and completely resolved within 24hours. The signs fall within a vascular territory such that there are negative symptoms i.e. something is absent.
Patients who have persistent neurology and signs, new AF or cardiac murmurs, significant hypertension or are high risk should be admitted.

Risk Assessment 'ABCD2 score

- Age [>60yrs = 1]
- BP [systolic>140 and/or diastolic >90 = 1]
- Clinical features [unilateral weakness = 2, speech disturbance alone=1, other=0]
- Duration of symptoms [>60min=2, 10-59=1, <10=0]
- Diabetes [ yes = 1]

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.

If completely resolved, the patient is low risk and there are no contra-indications, commence aspirin and refer to TIA clinic. ABCD score of 6 more ADMIT. (this is different from CREST)
The ward clerks will fax referral if you ask them


Pathway for query TIA/TIA
Monday-Friday 9am – 5pm, Antrim Hospital
Daily TIA Clinic Access
Inpatients (INP)
ED Referral
GP Referral
If high score query TIA at the weekend, person admitted to ward – A1 to aid specialist assessment
INP - Mon-Fri
Scanning slots as per INP.
For MRI, INP will be facilitated in other INP slots and will continue to be authorised by consultant radiologists.
Present to ED department with query TIA with symptoms that have fully resolved
(If unresolved neurology contact stroke team for further advice)
Mon-Fri 9-5
Refer to stroke team on ext. 331433 after triage
Out Of Hours
Advise person they may require review in DAU
Commence Aspirin 300mg
Forward referral by email to TIA.Referral@northerntrust.hscni.net
Referrals received via CCG
Referrals vetted by a member of the stroke team
If patient requires an appointment the Stroke Nurse Specialist contacts patient by telephone with the appointment details and then contacts DAU admin who will book the patient on for the agreed time slot.
Admin support provided by DAU
Nursing support to clinic provided by DAU – bloods etc.
Daily TIA clinic approx. 3/4patients per day
In DAU- located together if possible
Recorded on Symphony
Triaged and treated as DAU patient
Seen by doctor to assess for TIA
Seen between 9.30 – 10.30 (11.30 if demand)
Record on Symphony
If scanning required
Doppler
MRI
CT
Referral by stroke nurse or doctor
Referral by doctor grade above foundation
Referral by any grade of doctor
Protected slot
Mon-Fri
1 per day
No dedicated slots for Thursday afternoon Stroke Review Clinic.
If no Sonographer available to carry out scanning an appointment will be provided as soon as possible. Please ensure that the coordinator for the ultrasound department is directly contacted to provide an appointment.
Protected slot
Mon –Fri (1 per day)
Time approx. 12noon
Contact MRI coordinator directly on 332008 to authorise referral. Referrals must include all MRI safety information. If slot is not going to be used, inform by book scan by 11.30 a.m.
Protected slot
Use of unscheduled care slot
Mon-Fri
CT brain to be requested only if there is clinical suspicion of an alternative diagnosis that CT could detect (as per NICE guidelines).
Contact CT coordinator directly to have referral authorised.
Please refer to CT as early in the day as possible. CT will aim

## Cancer patients & chemotherapy

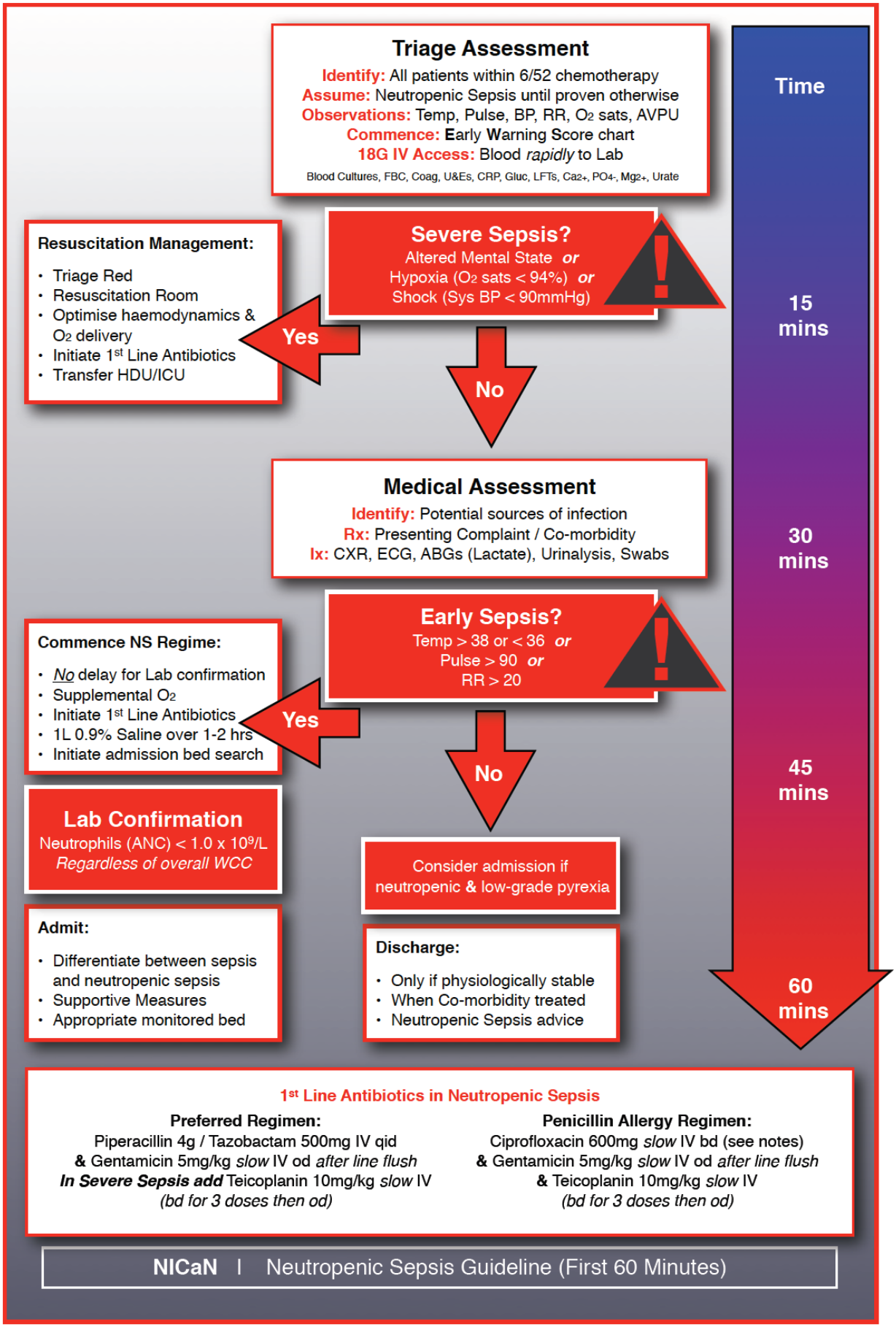
**All patients who develop illness post chemotherapy should be directly admitted to either a medical or surgical ward; ideally they should not come through the Emergency Department.**

GPs should be aware that they arrange direct admission by contacting the relevant house officer. If for any reason a GP-referred chemotherapy patient presents to Emergency Department they should be triaged as very urgent, given any immediate treatment necessary as outlined in the box below and then re-directed to the relevant ward at once (unless they have evidence of sepsis which should activate the neutropaenic sepsis pathway). Some cancer patients carry a blue book containing a summary of their records, please make use of this. If a post-chemo patient has self-referred to the Emergency Department, the same principle applies - they should be seen at once and moved to the ward. If there is delay in obtaining a bed for any reason, contact the Emergency Department Consultant.

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 via BCH.

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 (7-111-0) or from the on-call Emergency Department consultant. Some patients are transferred direct to BCH following consultation with them.


Triage Assessment
Identify: All patients within 6/52 chemotherapy
Assume: Neutropenic Sepsis until proven otherwise
Observations: Temp, Pulse, BP, RR, O2 sats, AVPU
Commence: Early Warning Score chart
18G IV Access: Blood rapidly to Lab
Blood Cultures, FBC, Coag, U&Es, CRP, Gluc, LFTs, Ca2+, PO4-, Mg2+, Urate
Time
Severe Sepsis?
Altered Mental State or
Hypoxia (O2 sats < 94%) or
Shock (Sys BP < 90mmHg)
Resuscitation Management:
Triage Red
Resuscitation Room
Optimise haemodynamics & O2 delivery
Initiate 1st Line Antibiotics
Transfer HDU/ICU
Yes
No
15 mins
Medical Assessment
Identify: Potential sources of infection
Rx: Presenting Complaint / Co-morbidity
Ix: CXR, ECG, ABGs (Lactate), Urinalysis, Swabs
30 mins
Early Sepsis?
Temp > 38 or < 36 or
Pulse > 90 or
RR > 20
Commence NS Regime:
No delay for Lab confirmation
Supplemental O2
Initiate 1st Line Antibiotics
1L 0.9% Saline over 1-2 hrs
Initiate admission bed search
Yes
No
45 mins
Lab Confirmation
Neutrophils (ANC) < 1.0 x 10⁹/L
Regardless of overall WCC
Consider admission if neutropenic & low-grade pyrexia
Admit:
Differentiate between sepsis and neutropenic sepsis
Supportive Measures
Appropriate monitored bed
Discharge:
Only if physiologically stable
When Co-morbidity treated
Neutropenic Sepsis advice
60 mins
1st Line Antibiotics in Neutropenic Sepsis
Preferred Regimen:
Piperacillin 4g / Tazobactam 500mg IV qid
& Gentamicin 5mg/kg slow IV od after line flush
In Severe Sepsis add Teicoplanin 10mg/kg slow IV
(bd for 3 doses then od)
Penicillin Allergy Regimen:
Ciprofloxacin 600mg slow IV bd (see notes)
& Gentamicin 5mg/kg slow IV od after line flush
& Teicoplanin 10mg/kg slow IV
(bd for 3 doses then od)
NICaN | Neutropenic Sepsis Guideline (First 60 Minutes)

## Palliative Care

Admission to hospital is not the best option for all cancer patients especially when terminally ill – specialised community nursing support may be better. A senior doctor should always make this decision and the patient's wishes are paramount.

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 staff grade doctor Macmillan nursing teams are also available senior nursing staff can guide on how best to contact them.

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** | ***On diamorphine*:1/6 of total 24hr dose (max: 25mg)**<br>***On morphine*:1/18 of total 24hr dose (max: 25mg)**<br>***On fentanyl patch*: (patch dose)/ 5 mg = dose of diamorphine (max 25mg)**<br>**Not on an opiate: 5-10mg** | **Pain** |
| | **2.5-5mg** | **Breathlessness** |
| **Midazolam** | **2.5-5mg**<br>**5-10mg**<br>**5-20mg**<br>**5-20mg (iv titrate)**<br>**30mg/24hrs (sc infusion)** | **Breathlessness + anxiety**<br>**Myoclonic jerks**<br>**Terminal agitation**<br>**Severe haemorrhage**<br>**Seizures** |
| **Diazepam** | **10mg (rectal)** | **Seizures** |
| **Haloperidol**<br>**Cyclizine**<br>**Metoclopramide**<br>**Levomepromazine** | **1-2.5mg**<br>**50mg**<br>**10-20mg**<br>**12.5-25mg** | **Nausea/vomiting** |
| **Hyoscine** | **0.4-0.6mg** | **"Death rattle"** |

## Poisoning (see also Deliberate self harm, legal issues)

THE LAB CAN SCREEN FOR MANY COMMON POISONS BUT YOU MUST SPECIFY WHAT YOU ARE LOOKING FOR –SEEK SENIOR ADVICE IF IN DOUBT, A NON-SPECIFIC SCREEN IS NEVER HELPFUL. DO NOT REQUEST BENZODIAZEPINE OR SERUM ALCOHOL SCREENING IN ADULTS WITH SUSPECTED POISONING; THE RESULT IS MEANINGLESS

Always consult the Poisons Computer and follow its advice about poisoning, do not assume that you know what to do - 'Toxbase' advice regularly changes.

Paracetamol poisoning has a significant mortality and morbidity – Most patients requiring inpatient care should be admitted to Observation ward You must be aware of the following key points:

Most paracetamol tablets contain 0.5 grammes of Paracetamol

Consenting Patients attending within one hour of ingestion should take oral activated charcoal immediately

Do not erect Parvolex or check Serum Paracetamol until 4 hours after ingestion irrespective of dose ingested.

Time when 4-hour paracetamol level is due should be clearly marked on flimsey (24-hour clock) and otherwise well can go to the Observation ward to await results and psych review
Patients presenting between 8-15 hours require immediate administration of "Parvolex".
The treatment dose of Parvolex is by weight and there are tables available on the shop floor to guide you on the dosages.

Patients who have taken a 'staggered' paracetamol overdose (often accidentally for severe pain) must have Parvolex erected immediately. Serum paracetamol, LFTs, coag and glucose should be monitored but the Parvolex treatment should normally continue for 24 hours.

Vomiting is an early sign of Paracetamol toxicity – monitor LFTs etc

An exhaustive list of poisons management is beyond the scope of this book – this is available to you on Toxbase

## IMMEDIATELY LIFE-THREATENING POISONS

### Life-threatening Ecstasy Poisoning

Often 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.

### 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.

# Diabetic patients

## These notes are from the Trust protocol - use the Intranet and follow the TRUST PROTOCOL

## * NB everyone <18yrs presenting in DKA should be treated on the paediatric protocol.

**Guideline for treatment of diabetic ketoacidosis (DKA) and hyperosmolar non-ketotic state (HONK) in adults**

**This document is also the prescription, administration and monitoring record. See also treatment guidelines available on the trust intranet.**

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## Diabetic Ketoacidosis (DKA) treatment protocol (≥18 years)

For patients <18 years use BSPED guideline: www.bsped.org.uk/professional/guidelines/docs/DKAGuideline.pdf or see hospital intranet

Write in CAPITAL LETTERS or use addressograph

Surname: _____

First names: _____

H & C No: _____ Check identity

DOB: _____

### Diagnostic criteria and management guidance

**DIABETIC KETOACIDOSIS**

Laboratory blood glucose >11 mmol/L or known diabetes mellitus
Venous pH<7.3 and/or venous bicarbonate < 15 mmol/L;
Capillary/serum hydroxybutyrate (ketones) >3 mmol/L; or significant ketonuria 2+ or more. (Note: urine ketones can be falsely negative in early stages)
*Measure arterial blood gases in reduced GCS or respiratory distress.*

**Treatment aims:**
**Fall in blood glucose 3 mmol/L/hour;**
**Fall in blood ketones 0.5 mmol/L/hour (or increase venous bicarbonate 3 mmol/L/hour);**
**Keep potassium in normal range;**
**Avoid hypoglycaemia.**

**INFUSION FLUIDS (prescribe on fluid balance chart)**

If serum sodium rises > 155 mmol/l can switch to sodium chloride 0.45%

- 0.9% sodium chloride 1000ml over first hour, then
  1000ml with potassium chloride over 2 hours, then
  1000ml with potassium chloride over 2 hours, then
  1000ml with potassium chloride over 4 hours, then
  1000ml with potassium chloride over 4 hours, then
  1000ml with potassium chloride over 6 hours.

Hyponatraemia in a patient with elevated blood glucose is largely dilutional and will correct as the glucose falls. **(Corrected sodium = serum sodium + [0.4 x (plasma glucose - 5.5)]**

- **More cautious rates for young people (18-25y), pregnant, elderly, heart or renal failure. See note on cerebral oedema below.**
- **Systolic BP below 90mmHg** likely to be due to low circulating volume, but consider other causes eg heart failure, sepsis. Give 500mL 0.9% sodium chloride over 10-15mins. If SBP remains < 90mmHg repeat and request senior input. Consider HDU. Once SBP is >100mmHg, give 1000ml 0.9% sodium chloride.

- **ADD 10% glucose 125ml/hr when blood glucose falls to < 14 mmol/L** until ketoacidosis resolved (see 'Insulin' section below).
- **When ketoacidosis resolved** but not eating/drinking then change glucose infusion to 5% at 125ml/hr with variable rate insulin infusion (see prescription record). Continue 0.9% sodium chloride & potassium as needed to correct circulating volume & maintain electrolyte balance.

**POTASSIUM (prescribe on fluid balance chart)**

- Change to potassium-containing 0.9% sodium chloride after first blood results.

**Potassium replacement: mmol/L of infusion**

| | |
|---|---|
| > 5.5 | Nil |
| 3.5-5.5 | 40 mmol/L |
| < 3.5 | Senior review |

If K <3.5mmol/L check hourly, additional potassium required. Stop insulin temporarily. Consider HDU advice and central line infusion for higher concentration

**Consider HDU advice:** Young people aged 18-25 years, pregnant, elderly, heart or renal failure or other serious co-morbidities or Severe DKA: (Initial results: ketones > 6, bicarbonate <5, pH <7.1, Potassium < 3.5, GCS <12, SBP <90, HR >100 or <60bpm, Anion Gap>1
Refer also if suspect cerebral oedema (see below).

**INSULIN (see overleaf)**

- Prescribe Actrapid® infusion 'as per DKA Protocol' on the main drug prescription chart.
- Commence insulin infusion (50 units / 50 ml 0.9% sodium chloride) via syringe driver at **fixed rate of 0.1 unit/kg/hour** based on estimate of weigh
- In the event of a delay in starting IV insulin, then give 0.1 unit/kg/hour IM. If cannot obtain IV access seek senior aid and consider HDU.
- If patient normally takes long-acting insulin analogue (Lantus®, Levemir®, Tresiba®) continue at usual dose and time.
- **Continue fixed rate insulin infusion until ketoacidosis is resolved (see bottom box).**
- Once resolved:- If still not eating then prescribe continued fluids as above with **variable rate insulin infusion** (VRII) (See reverse of sheet). - If eating then change to subcutaneous insulin at a meal time (preferably guided by diabetes team). Continue IV insulin and glucose until at least 30-60 minutes after first subcutaneous insulin is administered.

**MONITORING**

- Baseline capillary ketones, laboratory blood glucose, venous pH, U&E, Mg, PO4, FBC
- Hourly capillary blood glucose and capillary ketones (until ketones <0.5).
- If no capillary ketones are available monitor venous bicarbonate until >18
- Venous pH, bicarbonate, glucose and potassium (point-of-care test) at T=0, 1hr and 2hr, then 2 hourly until venous pH >7.3 and/or venous bicarbonate >18
- **Always use laboratory glucose if point of care result is out of range.**
- **Monitor Laboratory serum U&E 4 hourly**
- Monitor GCS 4 hourly in ALL cases; if it falls assess for cerebral oedema
- Cardiac Monitoring (severe DKA, hypokalaemia or concerns about cardiac status)
- Continuous pulse oximetry if required

**ADDITIONAL MEASURES**

- Assess ABCDE and consider precipitating causes
- Nasogastric tube with airway protection if obtunded or persistently vomiting
- Thromboprophylaxis
- Aim urine output > 0.5ml/kg/hr. Consider urinary catheter if incontinent or anuric (no urine output by 60mins).
- IV bicarbonate is NOT recommended
- Check phosphate. Carefully correct phosphate only if < 0.3mmol/L, cardiac dysfunction, haemolytic anaemia or respiratory despression.
- Manage patient only in agreed wards/units.

**Cerebral Oedema:**

- potentially fatal in young adults
- features usually develop 4-12h after start of DKA treatment.
- **Early:** headache, seizure, GCS drop, vomiting, lethargy, DBP >90.
- **Late:** Abnormal response to pain, cranial palsy, fluctuating GCS, decerebrate, neurogenic respiratory pattern, sustained bradycardia
- If suspect: inform most senior clinician on duty, request ICU & urgent CT brain. **Do NOT delay management while await CT.**
- **Mannitol** 1g/kg IV over 20mins.If no response, repeat in 30-120mins
- Reduce fluid infusion rate by 33%
- Elevate the head of the bed

**If glucose and ketones not falling as expected (see 'aims'):**

1. Insulin pump working & connected? Correct residual insulin vol?.
2. Check cannula, infusion set & intravenous fluids pump.
3. Increase insulin infusion each hour by 1 unit/hr increments until target falls achieved: see aims, prescribe dose change overleaf.

**Expect resolution of ketoacidosis by 12 hours**, if not then review fluid requirements and continue fixed rate insulin, 10% glucose and 0.9% sodium chloride as needed. Discuss with senior and diabetes clinicians.

**Criteria for ketoacidosis resolution:** ketones <0.5 mmol/l, venous pH over 7.3 and/or venous bicarbonate > 18mmol/L (after 6-12hrs bicarbonate is NOT useful as a marker of ketoacidosis resolution).

**Intravenous insulin infusion prescription**

**1. Fixed rate insulin infusion (until ketoacidosis resolved)**

| Standard rate = weight (kg) x 0.1 = units/hr | Alternate rate = | Alternate rate = | Alternate rate = |
|---|---|---|---|
| Signature | | | |
| Date | | | |
| Time | | | |

**2. Variable Rate Insulin Infusion (VRII)**

(start when ketoacidosis resolved until eating/drinking: see notes over)

| Capillary blood glucose mmol/L | Standard insulin infusion rate units/hour | Alternative insulin infusion rate units/hour |
|---|---|---|
| >16 | 6 | |
| 12.1 – 16 | 4 | |
| 10.1 -12 | 3 | |
| 7.1 – 10 | 2 | |
| 4.1 – 7 | 1 | |
| <4.0 | 0 | |
| Signature | | |
| Date | | |
| Time | | |

Write in CAPITAL LETTERS or use addressograph

Surname: _____

First names: _____

H & C No: _____

DOB: _____

Hospital: _____ Ward: _____

Consultant: _____

- Measure 50 units Actrapid® from vial using insulin syringe.
- Draw up 50 ml sodium chloride 0.9% into 50 ml syringe.
- Pull plunger back to make an air space and remove needle.
- Add 50 units Actrapid® insulin through top of 50 ml syringe, cap syringe with needle or hub cap, invert to mix, expel excess air and label syringe. Prime infusion line.
- Insulin may be infused in same line as fluid using Y-connector with one-way anti-siphon valve and large-bore cannula.

| | Date | Time | Prepared by | Checked by |
|---|---|---|---|---|
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |

**Administration and monitoring record**

- Start recording at the start time of the infusion. Protocol chart is valid from 8am until 8am the following day.
- Measure capillary blood glucose every hour and record here. Check ketones (meter or laboratory) 1-2 hourly until <0.5.
- **Venous pH, bicarbonate, glucose & potassium (point-of-care test) at T = 0, 1 hour, 2 hours then 2 hourly until ketones <0.5, venous pH >7.3 and/or venous bicarbonate >18mmol/L. Check serum electrolytes (laboratory) 4 hourly.**

**Don't forget that DKA may present as a hyperventilation attack or abdominal pain in adults or children with no history of Diabetes.**

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 inter-current 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.

**Special pitfalls for diabetic patients**

- All diabetic patients with foot wounds 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 admitted

18 Years and over

# Hospital Management of Hypoglycaemia in Adults with Diabetes Mellitus

Hypoglycaemia is defined as a blood glucose level less than 4mmol/l

## Causes

- Missed Meals
- Not enough food
- Reduced appetite
- Too much insulin or oral diabetes medications
- Mobilisation after illness
- Inappropriate use, of 'stat' or 'PRN' Insulin
- Illness –vomiting/diarrhoea
- Impaired renal function
- Severe hepatic dysfunction

## Symptoms

The patient may appear to be:

- Anxious
- Excited
- Dizzy
- Sweaty
- Pale-faced
- Confused
- Aggressive
- Disoriented
- Lacking concentration
- Agitated
- Drunk

The patient may complain of:

- Feeling Hungry
- Nausea
- Headache
- Tingling around mouth
- Blurred vision
- Palpitations

**Hypoglycaemia is a blood glucose of < 4mmol/l. Wherever possible, check blood glucose level prior to treatment. If patient is asymptomatic, repeat test.**

4 mmol/l | 3 mmol/l | 2 mmol/l | 1 mmol/l

### MILD

Patient conscious and able to swallow

Trembling, sweating, hungry, tingling, headache, anxiety, palpitations, nausea, forgetfulness

### MODERATE

Patient conscious and able to swallow, but in need of assistance.

Difficulty concentrating, confusion, weakness, giddiness, drowsiness, unsteady, headache, dizziness, difficulty focusing and speaking.

### SEVERE

Patient unconscious Or unable to swallow

Check - Airway - give oxygen
Breathing
Circulation
Disabilty {glucose & GCS}
Exposure

If patient on insulin infusion - stop immediately

**Call for Help**

### STEP 1

Administer 15 - 20 G fast acting carbohydrate
- 60 mls Glucojuice
- 170-225mls lucozade
- 150 -200mls pure fruit juice (avoid in moderate to severe renal failure)
- 4-6 Glucose tablets

Administer 1.5- 2 tubes of glucose 40% gel {Ensure gag intact}

If Ineffective give 1mg Glucagon IM (See notes below)

Three Options available:
1. 75 - 100mls of 20% Glucose IV over 15 minutes, into a large vein. (Repeat capillary Glucose measurement after 10 minutes. If still < 4mmol/l, then repeat)

Or

2. Glucagon 1mg IM (See notes below)

Or

3. 150 - 200mls of 10% Glucose IV over 15 minutes

PEG/NG fed patients - Give 60 mls Glucojuice and recommence feed if stopped. If JEG tube fed - follow severe treatment

### STEP 2

Wait 10 - 20 minutes and recheck glucose levels
If reading is still < 4mmol/l, and no physical improvement repeat step 1 up to 3 times.

If capillary glucose remains < 4. Consider Glucagon 1mg IM (if not already received this) or 75 - 100mls of 20% Glucose IV over 15 minutes.

Once patient is conscious, give sips of lucozade or 2 - 4 teaspoons of sugsr in water etc.

Recheck glucose every 10 minutes to ensure increase to at least 4 mmol/l.

**ALWAYS FOLLOW UP WITH LONG ACTING CARBOHYDRATE**

Once capillary glucose level is > 4mmol/l and patient has recovered, give:
2 plain biscuits or 1 slice of toast or next meal if due (must contain carbohydrate) or 200mls milk.
Patients given IM glucagon require a larger portion of long acting carbohydrate to replenish glycogen stores (Double the amount above)

## Point to Note

- Glucagon is less effective in hepatic dysfunction and/or glycogen depletion e.g ethanol related hypoglycaemia or in sulphonylurea therapy.
- Oral Glucose (ideally food) should be given as soon as the patient is alert and conscious, if nil orally consider 10 % Glucose at 100mls/hr.
- Secondary cerebral oedema may complicate hypoglycaemia and should be considered in cases of prolonged coma despite improving glucose. Mannitol or dexamethasone may be helpful.
- Continue to check glucose levels every 30 min for 2 hours, maintaining blood glucose levels > 4mmol/l
- Determine the cause of the hypoglycaemic episode
- Review medications and adjust as necessary
- On Admission prescribe Glucagon 1mg Intra muscular (IM) on the front of the glucose monitoring chart and reference on the drug Kardex.

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# Ear Emergencies

- 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 nerve palsy involving entire half of face*

- Exclude other cranial nerve involvement.
- Examine throat and ear for herpetic vesicles or middle ear infection.
- Give 5 day course of oral Acyclovir for all uncomplicated Bell's.
- Add Prednisolone 40mg daily if paralysis is complete.
- Eye protection with artificial tears or Lacrilube gel and eye patch at night.
- Discuss with ENT doctor for review in 3-5 days.
- 80-90% full recovery expected for uncomplicated Bell's.

## Nose

- Displaced nasal fractures
  - Clinical diagnosis – X-rays not indicated
    - Refer to ENT clinic by giving appointment card marked "ENT appt 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

- Partial upper airway obstruction (stridor). DON'T TOUCH! Notify both anaesthetist and ENT. (Simple Croup is an exception – give a 'Pulmicort' nebule and refer to paediatrics).
- Patients with quinsy have severe pain, trouble with swallowing or opening mouth. Give im Voltarol and contact ENT.
- Simple sore throat – see antibiotic protocol.
- 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.
  - IV antibiotic, e.g., Co-Amoxiclav.
  - Do not remove clot in tonsil bed!

- Ludwigs angina- bilateral cellulitis of the submadibular 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 FB) 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!**

## Eye Emergencies

The triage nurse will check visual acuity and will apply amethocaine 1% drops for corneal discomfort. Patients over 50 with headache and/or visual upset will need to have an ESR checked.

When examining eye patients, acuity must be recorded. All patients with suspected corneal problems must be examined with the slit lamp prior to discharge. All patients with visual upset (either symptom or on eye chart) must be examined with an opthalmoscope. All patients with history of sharp, small FB striking eye at high velocity should have x-ray to exclude intra-ocular FB. Steel striking steel (e.g. hammer and chisel) is especially hazardous. Welding does not normally cause an intra-ocular foreign body.

**Patients requiring immediate ophthalmic assessment**

- Significant visual loss
- Severe eye pain
- Penetrating ocular trauma and lid lacerations
- Post-operative red or painful eye

**Cases requiring immediate assessment can be referred to the ophthalmology on call at RVH**

**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)

These patients can be given a letter and asked to attend eye casualty RVH next day (working hours)
NSAIDs (voltarol drops) may inhibit corneal healing and should NOT be prescribed.

**Conditions suitable for Emergency Department 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)
- Chemical burn (irrigate immediately with several litres of normal saline until pH returns to neutral, remembering to evert upper lid. May require RVH referral)
- Welder's flash (amethocaine 1%, cyclopentolate and voltarol drops, chloromycetin, double eye pad and bandage)

**Conditions that should be reviewed at the Emergency Department:**

- Staining corneal abrasion including those caused by foreign body removal (these patients may be advised to come back "sos". Corneal abrasions should not become more painful and they should be healed after 48 hours)
- Rust ring
- Chemical burn
- Welder's flash

## Meningococcal Disease- Adults

**Presentations 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 – $O_2$ NRRM
- Benzyl Penicillin 2.4 grams slow iv
- Cefotaxime 2 grams slow iv
- Vigorous resuscitation with IV crystalloid + colloid
- Notify Anaesthetist and inpatient medical team
- Ensure that Public Health are notified (immediate family will need prophylaxis)
- DO NOT send PCR from EMERGENCY DEPARTMENT

## Toxic Shock Syndrome

Gram positive bacteria: Usually Staphylococcal. Occasionally streptococcal.

- Fever >38.9
- Hypotension
- Macular Rash (mucous membrane involvement)
- Diarrhoea
- Collapse

Treatment is supportive and high-dose flucloxacillin

# Septic Shock (Non specific)

Usually caused by pneumococci or gram negative organisms.

**Presentation**

Focus of infection (may not be apparent initially)
Fever >38 or <36
Heart Rate >90
Respiratory Rate >20
WCC >12, 000or < 4,000 /mm3

**Management**

- Recognise early & seek advice (see Early recognition of the sick patient p45)
- Give oxygen 100% via NRRM
- Give N saline 1 litre rapidly and monitor response
- Check Blood Cultures (x2 from different sites)
- Give empiric antibiotics (eg Tazocin 4.5g iv plus Gentamicin 1.5mg/kg slow iv (reduce if renal function abnormal)
- Catheterise bladder and measure urine output
- Check FBP, coag, blood gas, u&e, glucose, lactate, CRP, LFT, bone profile
- Perform ECG and CXR

## Cellulitis- Lower Leg

Cause
- Usually streptococcal
- 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
- Athlete's foot (recurrent disease)
- Lymphoedema
- Varicose eczema
- Obesity

Diagnosis
- Malaise and fever
- Progressive painful swelling and erythema
- UNILATERAL

**Differential Diagnosis**

| | |
|---|---|
| **Lower leg eczema** | **Itchy, non tender. Scaling or crusting** |
| **Acute oedema/blisters** | **Usually bilateral** |
| **Chronic lymphoedema** | **Can be red but no fever/malaise. Usually bilateral** |
| **DVT** | **Usually not well demarcated proximal margin of erythema. May be calf tenderness. Can co-exist** |
| **Peripheral Vascular Disease (including DM)** | **Delayed cap refill. Can co-exist** |
| **Compartment Syndrome** | **Sharply localised and extreme tenderness** |
| **Vasculitis (eg E.N.)** | **Usually bilateral. Mainly anterior shin** |
| **Necrotising Fasciitis** | **SEVERE / CRESCENDO PAIN. High WCC. Positive blood cultures, low Na+, Blistering / superficial necrosis.** |

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
- Flucloxacillin 1g qid or Co-Amoxiclav 1.2g TDS iv via ACAHT for 48 hours if non-responding to oral antibiotics or severe at presentation
- Clindamycin for penicillin-allergic patients (Consultant Exemption form required)
- Affected areas should be elevated if possible – hands or fingers should be splinted in a volar slab
- Failed treatment with above -seek senior advice
- Consider admission to observation ward for anti-pressure mattress if resistant

- Avoid NSAIDs (associated with higher incidence of Nectrotising 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 protocol 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 an "enteric precaution" area unless definitely not a gastroenteritis case (eg vomiting due to mi)
2. The patient should have a full doctor's assessment to exclude surgical/non-infective cause for symptoms (ie 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 combined iv /oral method described below should be attempted over four hours in an infection-control cubicle in the Emergency Department. Patients should be monitored for this period.
6. If they require admission to another ward, the Bed manager should be asked to find an appropriate bed according to Infection Control Guidelines
7. Take care in elderly patients consider Mesenteric ischaemia in patients with significant associated abdominal pain and check venous lactate if elevated repeat after fluids and if not improved significantly consider ct scan/ surgical review

Combined IV / Oral Hydration

(Rough guide: For moderate dehydration – 50mls/kg or ~3 litres over 4 hours)

- Patient should be on an I/O chart
- IV fluids should be prescribed according to the state of hydration *and cardiovascular status* (eg 1.5 litres over six hours for a fit dehydrated patient)
- Oral fluids should be given as dioralyte or water, taken as sips over a minimum of 4 hours (eg 1.5 litres of fluid in a jug beside patient, warned to "drink little & often")
- 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 (see Immunisation)

*Required for corneal abrasions and burns as well as other wounds*

Green book has guidance on this subject.

Good wound toilet is the mainstay of prevention! Grossly contaminated wounds and uncertain immune status – give Tetanus Immunoglobulin (see BNF)

Children and Young Adults – confirm received childhood course. Refer to GP if booster may be required

Older patients – may not have received course – full course (liaise with GP) or booster if immune but ten years or more since last dose.

## 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 at their Occupational Health Department
- Other occupational exposure – eg police, council workers("binmen" etc) who should all be followed up at their employer's Occupational Health Department.

- 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 typed referral letter from you.

The general approach is that all these episodes, except those known to involve very high risk donors, do not pose a sufficient risk of HIV to warrant post-exposure prophylaxis ( PEP is as hard to tolerate as chemotherapy and its long term effects, especially the attendant risk of cancer, are not known). There is however a significant risk of hepatitis so patients should have a baseline serology sample checked and an accelerated course of Hep B immunisation (ie now, 4weeks and six months) with serology follow-up. Ask for senior help.

**Overview of post-BBV exposure management**

**STEP ONE: Assess the risk of the Donor ***

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 or bisexual
- from an endemic area (e.g. South East Asia - hepatitis B, parts of the African Continent - HIV)
- sexual contact with a high risk person

**STEP TWO: Assess the risk of the fluid or tissue**

The following contaminating fluids or tissue are classified as high risk-

- blood
- 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")

**STEP THREE: 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)

**STEP FOUR: Assess the 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'.

**STEP FIVE*:* Decide about treatment**

**1**. Very high risk recipients* - immediate treatment according to the regimes below.

2. Moderate risk recipients - qualified reassurance and their case should be discussed urgently with a senior doctor (occupational health or the Emergency Department).

3. Low risk recipients - reassured and referred to Occupational Health/GP.➔

**TREATMENT REGIMENS**

For HIV exposure

- Wash area of contact copiously and encourage to bleed where relevant
- Give recipient post-exposure prophylaxis starter pack, which contains five days' supply of the recommended triple therapy (Zidovudine, Lamivudine and Nelfinavir). A starter pack is kept in the Emergency Department. *The recipient should take the first dose immediately*
- Obtain sample from recipient for baseline HIV analysis
- Refer to Occupational Health/GP

For Hepatitis-B exposure

- Wash area of contact copiously and encourage to bleed where relevant
- Enquire about recipient's immune status. If they have not been immunised or if their titres did not indicate immunity following their vaccination course, administer Hepatitis Immune Globulin (this is obtained from the Belfast City Hospital) and start an accelerated immunisation programme by administering the first dose of "Engerix B" which is kept in the Emergency Department (different injection site)
- Obtain sample from recipient for baseline analysis
- Refer to Occupational Health/GP

For exposure to Hepatitis-C etc

- Wash area of contact copiously and encourage to bleed where relevant

- Obtain sample from recipient for baseline analysis
- Refer to Occupational Health/GP

* The “donor” is the patient whose fluid or tissue has contaminated the “recipient” who is the health care worker.

*There is more information in the Needlestick Injury file in the Computer Room, particularly in relation to procedures for Healthcare Professionals*

# Major Trauma Triage Protocol

**All patients who have been injured and who are seriously ill *OR* who have recognised risk factors for serious occult injury must be identified according to this protocol.**

## 1. TRAUMA TEAM CALL

***CALL THE TRAUMA TEAM IMMEDIATELY FOR ALL PATIENTS WITH ANY OF THE FOLLOWING CRITERIA:-***

| |
|---|
| 1. GCS less than or equal to 12 |
| 2. Systolic BP < 90mmHg or CRT >3secs |
| 3. Respiratory Rate >30 or <10/min |
| 4. Two or more proximal long bone fractures |
| 5. Burns >15% and/or burns to face/airway |
| 6. Severe chest injury |
| 7. ANY penetrating injury to head, neck, trunk |
| 8. Ejection from vehicle during crash |
| 9. Death of same-car occupant |

## 2. TRAUMA ALERT

***ALERT EMERGENCY DEPARTMENT TRAUMA TEAM MEMBER* ONLY FOR ALL PATIENTS WITH ANY OF THE FOLLOWING CRITERIA:-***

| |
|---|
| 10. Fall of 20 feet or more |
| 11. High speed RTA(>30mph for car & >15mph for any type of bike) |
| 12. Any damage to passenger compartment of car |
| 13. ANY pedestrian struck by a car or by any bike |

***ALL PATIENTS MUST GO STRAIGHT TO RESUSCITATION ROOM AND UNDERGO PRIMARY AND SECONDARY SURVEY***

*** This is the Emergency Department Middle Grade Doctor or the Emergency Department Consultant on duty**

## 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 of this book protocol given below.

The trauma team consists of the emergency anaesthetist, the surgical registrar and the senior Emergency Department doctor on call. The team members who are resident will come immediately to help you to assess and treat the patient. Before they arrive, you must start the assessment and treatment below.

**MAJOR TRAUMA**

**Follow Triage Protocol. Use the Sequence Below!**

***Primary Survey***

**1. Protect the neck with 'Stiffneck' collar, proper sandbags and tape**
**3. Go through the 'ABC' sequence (Resuscitation Section)**
**4. Mini-neurological assessment, AVPU, pupils, posture**
**5. Log-roll and examine spine – PR if spinal tenderness(remove spinal board)**
**6. Get an accurate history of the accident**
**7. Trauma protocol CTs when indicated**
**8. Imaging: WBCT vrs regional CT +/-plain xray**
**9. Tranexamic acid if significant bleeding is present**

***Secondary Survey***

**10. Keep re-assessing 'ABC'**
**11. Do a secondary survey - Head**
**Chest**
**Abdomen**
**Pelvis**
**Limbs**
**Reflexes**

- **Analgesia: give aliquots of Morphine 5-10mg iv with anti-emetic**
- **Patients may also require n.g./og tube and urinary catheter unless contra-indicated**
- **Don't waste time with patients who are unstable due to bleeding – the surgeons will want to get them to theatre as soon as possible**

# 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 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.

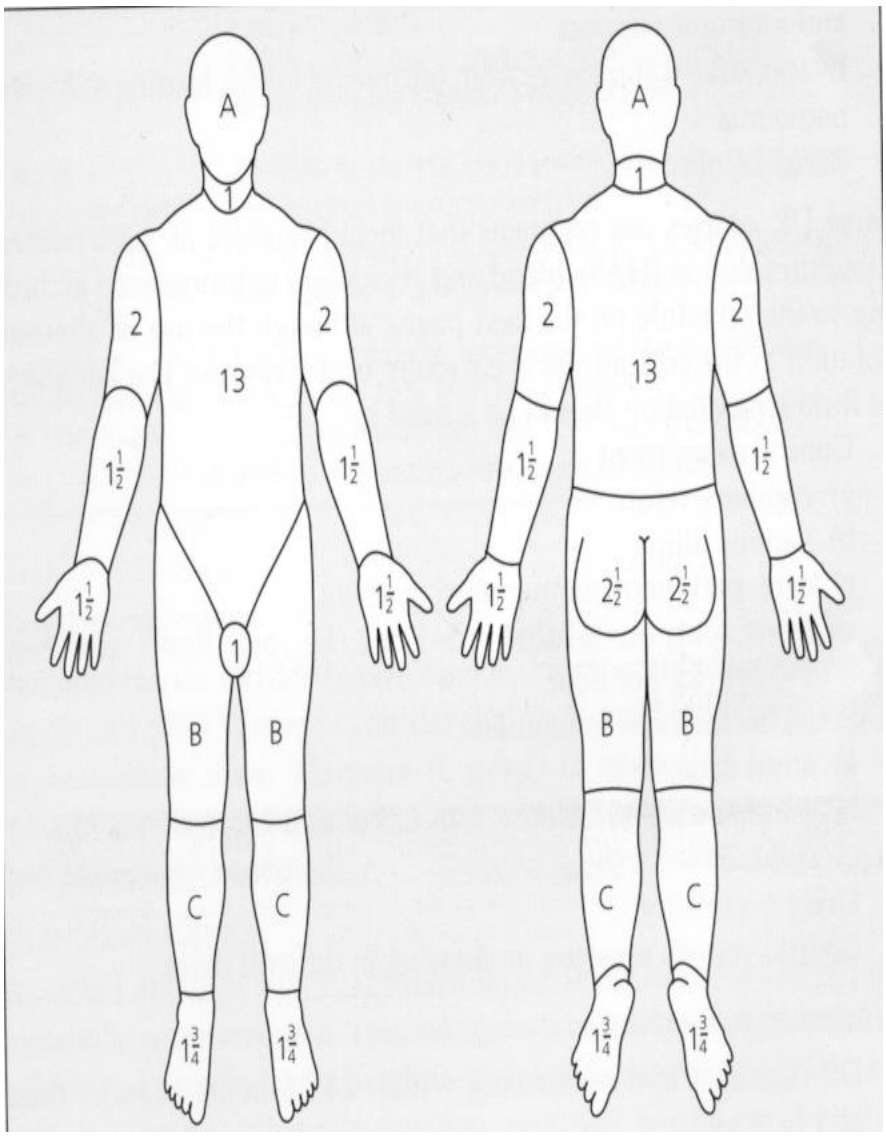
- Regimen as below:

DICOBALT EDETATE 300mg in 20ml amp

Give 300mg undiluted over 1-5mins followed by 50mls glucose 50%.
Repeat both injections twice after 5 min intervals if no response.

| | 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 .<br>Very painful and erythematous.<br>Excluded from estimates of % burns<br>Heals well |
| Second Degree (deep, partial) | Extends to dermis<br>Painful<br>Heals more slowly |
| Third Degree (full thickness) | Analgesic<br>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!***

The guidelines on the next page were circulated by the Chief Medical Officer – they must be adhered to or, if in doubt, the case discussed with a Consultant.

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.*

- SHOs should discuss their case with a more senior doctor (preferably the Consultant) before requesting CT/referring to the NSU.

- When communicating with the Neuro-surgical Registrar you must record his/her name and any advice given.

- If CT pictures are transferred to the NSU by image link or urgent transport this must also be recorded and ask the neurosurgeon to send you confirmation that they have been received.

- The trauma team must be asked to see all acutely head-injured patients requiring transfer to NSU. They should be evaluated according to ATLS Guidelines.

**All head-injured patients (including drunk ones!) must have regular CNS obs while in the Emergency Department. The trauma team must be called immediately for all patients with GCS<13.**

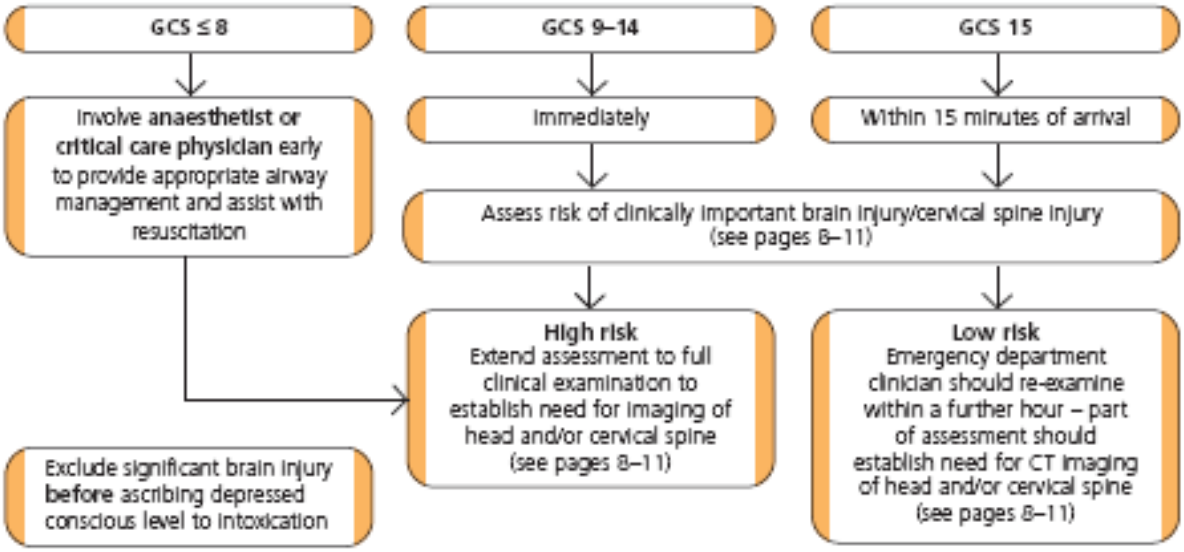
**Patients who are very drunk are especially prone to life threatening injury. A raised serum alcohol level does not exclude a serious head injury.**
**DO NOT MEASURE SERUM ALCOHOL.**

**GCS<9 requires immediate anaesthetic assessment for intubation**

**DO NOT send patients home if their GCS is less than 15 out of 15**

# Assessment in emergency department

**Stabilise airway, breathing and circulation (ABC) before attending to other injuries.**




## Pain management

- Manage pain effectively and reassure patients.
- Treat significant pain with low dose of intravenous opioids titrated against clinical response and baseline cardiorespiratory measurements.

## Training

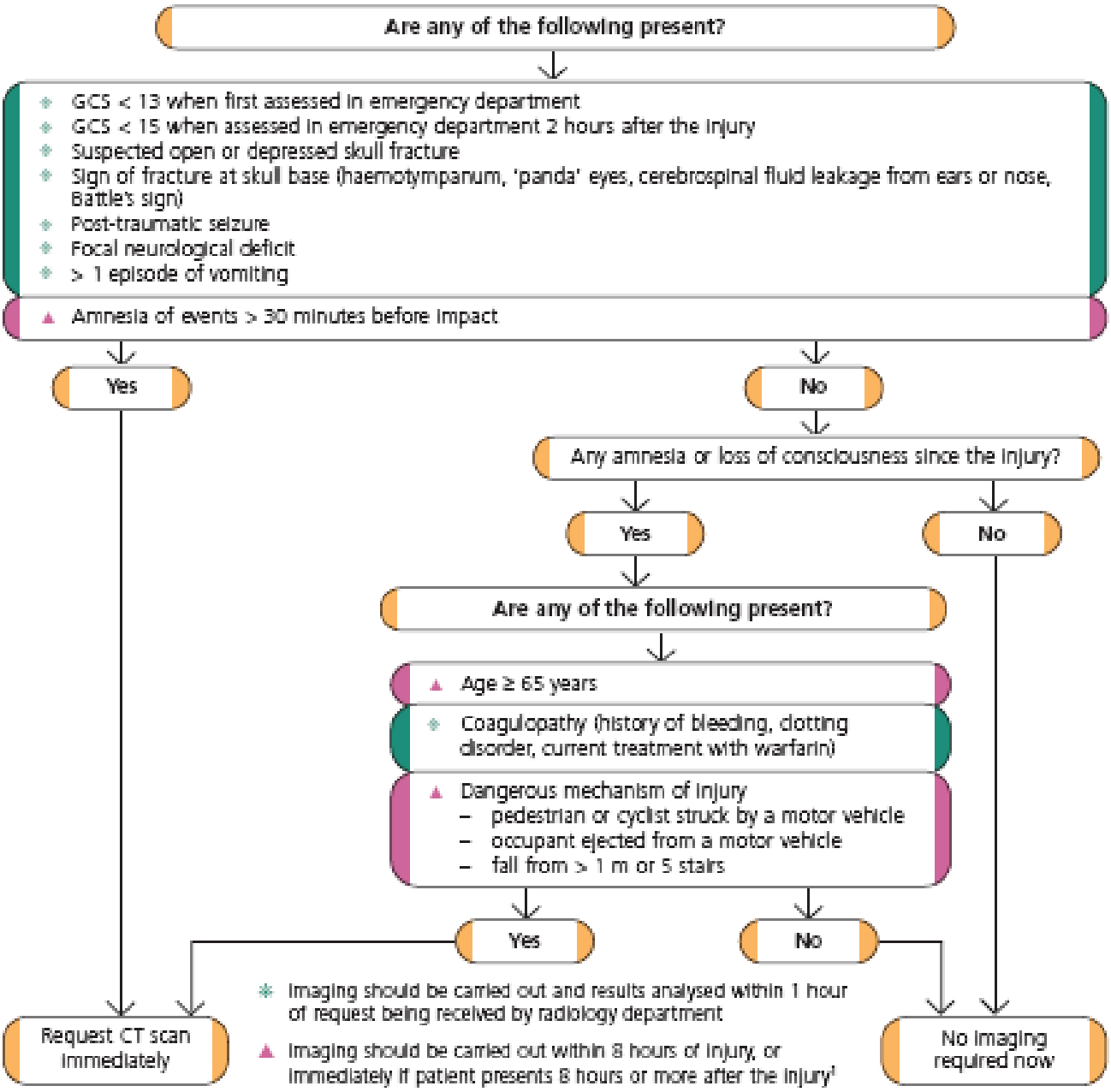
- All emergency department clinicians involved in assessing patients with head injuries should be able to assess the presence and absence of the risk factors listed on pages 8–11 on selection and urgency for imaging – training should be available as required to ensure this.
- Emergency department (and all in-hospital) observations of patients with head injuries should only be carried out by professionals competent in the assessment of head injury.
- All those involved in the assessment of infants and children with head injury should be trained to detect non-accidental injury.

**If patient returns to emergency department within 48 hours** of discharge with persistent complaint relating to initial head injury, involve a senior clinician with experience in head injuries and consider CT scan.

# Investigation for clinically important brain injury

**CT imaging of the head is the primary investigation of choice.**

## Selection of adults for CT scanning of head




[1]If patient presents out of hours and is ≥ 65, has amnesia for events more than 30 minutes before impact or there was a dangerous mechanism of injury, it is acceptable to admit for overnight observation, with CT imaging the next morning, unless CT result is required within 1 hour because of the presence of additional clinical findings listed above.

## Fractures (see Ankle and Foot, Shoulder and Clavicle, Knee, Neck, Wrist, Sedation, Falls, 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

- 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 Colle's fractures)
- All fracture necvk of femurs should be transferred to RVH for treatment UNLESS they unwell medically
- 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 consults with the RVH should be recorded on the Emergency Department notes and fracture doctor's name recorded. A Fracture Clinic proforma should be faxed to RVH immediately for each patient who has been accepted. The proforma should then be attached to the flimsey.
- NSAIDs may inhibit fracture healing and should NOT be prescribed.

General Approach to Soft tissue Injury:

- ASSESSMENT to exclude fracture, complete ligament tear etc
- EXPLANATION to patient/relative
- TREATMENT usually RICE (rest, ice,compression, elevation).

Liaison with Plastic Surgery Ulster hospital

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 all managed at the Review Clinic.

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 Review clinic in 1 weeks time.
- Children under three can remove short arm pops -use long arm pop with this age. 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

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. Show the x-ray to the patient and 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
- The departmental protocol for reductions in the Emergency Department is found in the CLINICAL SECTION under the heading "Sedation". You must follow protocol carefully or discuss with a senior doctor
- A post –reduction plaster should generally be A WIDELY 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.
- After reduction patients must have first check x-ray on day 7-10
- Failed reductions should be discussed with RVH
- Fracture reductions may be deferred until next day if no neurovascular compromise is found. Reduction of dislocations cannot be deferred.

## 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 (15mins 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).

**This section covers specific common minor injuries & musculoskeletal problems:**

- **Neck**
- **Facial & Dental**
- **Shoulder and clavicle**
- **Wrist**
- **Hand**
- **Knee**
- **Ankle & Foot**



# Neck (see also, Soft tissue injuries, Fractures)

## Pain without injury:

- **Usually muscular (Wry Neck)**

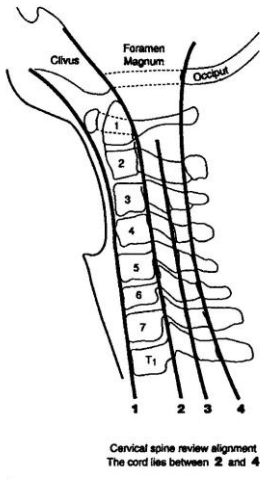
**NSAID, massage, heat, very urgent physiotherapy**
**Consider ENT cause in kids**

- **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.**




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).

**Do not accept non-diagnostic x-rays – seek senior advice.**

- **When x-rays discuss spinal injury, seek advice**

## NEXUS LOW-RISK CRITERIA

**Cervical spine radiography is indicated for trauma patients unless the exhibit ALL of the following criteria:**

**1.No posterior midline cervical spine tenderness**
**and**
**2.No evidence of intoxication**
**and**
**3.Normal level of alertness**
**and**
**4.No focal neurological deficit**
**and**
**5.No painful distracting injuries**



### 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

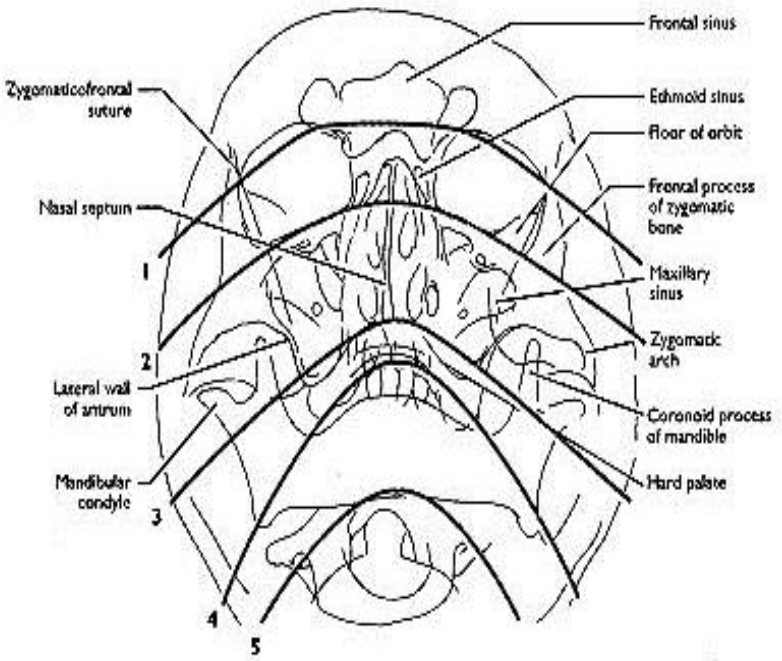
### Mandibular Fractures

- 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

## The Five Lines of the Facial X-ray




**ABCs of the Facial X-ray**

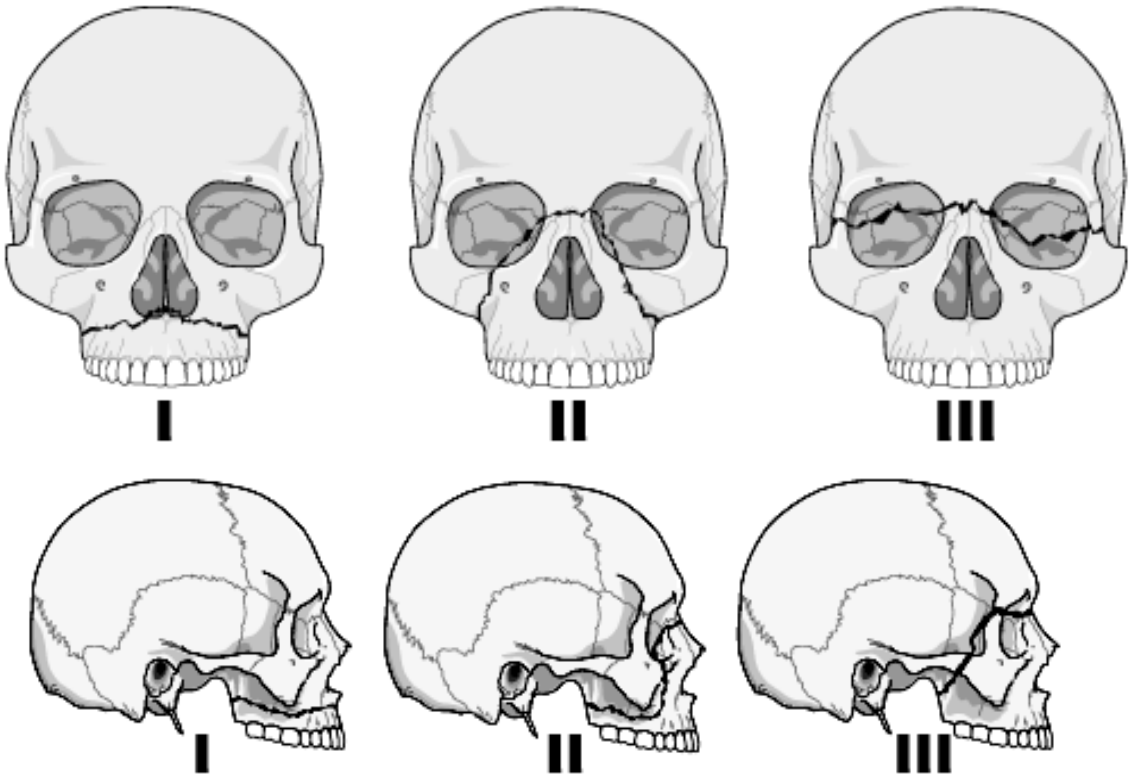
**Adequacy**
**Alignment**
**Check lines 1-5**

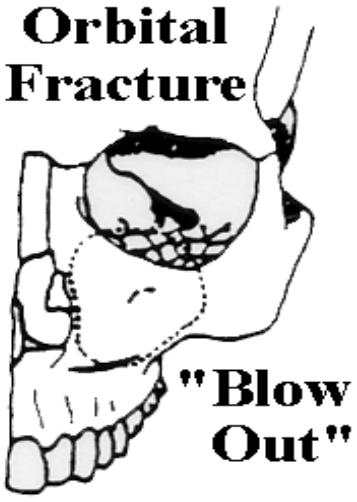
**Bones**

**Cartilage and joints**
**Zygomaticofrontal suture**

**Sinuses**
**Opacification**
**Air-fluid levels**
**Soft tissue**
**Swelling**
**Foreign bodies**

## Le Forts Fractures of the Face




### 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. The Belfast City Hospital and daldoc runs a dental pain clinic. Details in triage.**

## Dental pain

**Give strong analgesia +/- administer im diclofenac. Clove oil may be of benefit.**

## 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 always ask for a glenoid . Normal glenoid view is below.**
**Shoulder may be reduced under self-administered $N_2O$ from entanox bottle OR iv sedation (not both!). Consent must be obtained. Hippocratic method must be used – Kocher's only if this fails and cautiously if patient is over 65yrs of age. Aftercare – inside-clothes collar & cuff or polysling and FC review.**

### 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$^0$ 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 an SpR/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 patients aged 45+.

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.

2. It should be carried out on a trolley in the resuscitation room. Oxygen, defibrillator & iv diazepam must be available (in case of a prolonged convulsion following inadvertent intra-vascular injection of lignocaine)

4. Prepare the patient, explain the procedure, obtain consent. <1% (1 in 1000) chance of osteomyelitis

5. The forearm should be prepped with iodine. The operator must wear surgeon's sterile gloves.

6. Prepare 10ml 2% lignocaine in a 10ml syringe and green (21G) needle.

7. 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!)..

7. **Inject VERY SLOWLY to minimise the risk of complication**. The wrist will become tight. Put a sterile dressing (eg 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 Examination

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 1st MC**
- **Pain on flexion + ulnar deviation**
- **Pain over palmar scaphoid**

## Management

- **Clinical Scaphoid (ie 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-o-prene splint and bring back to nurse practitioner day 14.**
- **Radiological scaphoid fracture.**
  - **If you see a fracture SAPOP and FC – they are usually six-eight weeks in plaster.**

## 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 repaired in theatre by the Emergency Department staff depending on available resources.**

**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.**

**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 terminalization must be carried out in theatre.**

- **Amputation. Providing no bone is exposed the finger can be dressed with "mepitel", immobilised and reviewed at the next Emergency Department clinic. Patients will occasionally bring the amputated piece of finger with them. It is not usually feasible to suture this in place, however, it is wise to speak to the plastics SHO in case there is a chance of re-implantation.**
- **Partial amputation (Adults). This presents as a crush, a laceration or an avulsion of the nail. If you look at the finger closely you will see that it is partially amputated and the distal phalanx may be visible deep in the wound. Partial amputations usually do very well. You need to examine the injury to determine whether or not the nail bed has been significantly lacerated. If there is a deep nail bed laceration this will usually require primary repair and, if, necessary, you should seek advice from a senior Emergency Department doctor or the plastic surgeons. (Repair usually involves application of a glove tourniquet, careful removal of the nail and suture of the underlying nail bed with interrupted 5/0 vicryl using a non-cutting needle). If the nail bed is intact or there is only minor damage to it the finger should be splinted with steristrips, dressed with "mepitel" and immobilised. The patient should be reviewed at the next Emergency Department clinic.**

- **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.**
- **Finger terminalization must be carried out in theatre by an experienced doctor.**

**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, Ottawa Rules)

## Trauma

***X-RAYS ARE VIRTUALLY NEVER INDICATED AFTER KNEE INJURY- see OTTAWA RULES!***

**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

- Haemarthrosis must be drained in theatre and discussed with RVHFC
- Suspected rupture of extensor mechanism; x-ray patella and discuss with RVHFC
- Dislocated patella can be reduced immediately with iv pethidine and immobilised in POP cylinder. Refer to Fracture Clinic
- Dislocated knee must be reduced immediately. 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

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 in theatre.

## 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. Aspiration should be carried out in an operating theatre *and you are responsible for making sure that the aspirate gets to the laboratory!* 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

Ie 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, Ottawa Rules)

### Ankle Injuries

History

- Snap, crack or pop? – suggests significant bone or ligament injury

Examination

- Deformed or dislocated? Give iv Pethidine and pull straight at once or get help at once, then apply backslab POP – x-ray comes afterwards!

- Compound fracture? –Inadine, gauze and tape, iv Co-Amoxiclav, describe wound to fracture unit (Wound >Icm? 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 next page.
-

## Foot Injuries

- Avulsion fracture 5th MT base and isolated metatarsal fractures – Strapping and crutches if minor or POP if major. Refer to FC. Transverse(non-avulsion) fractures of 5th 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**

**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

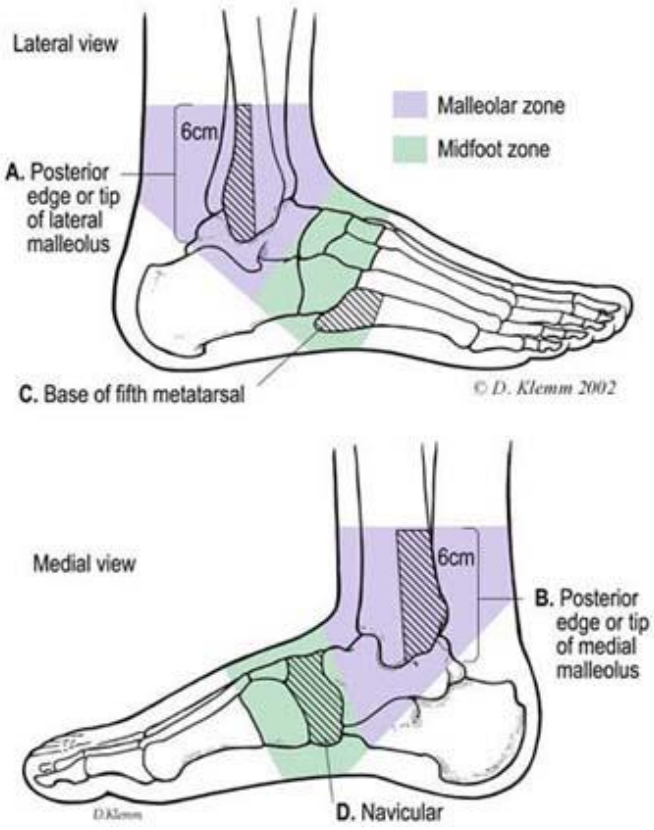
**GRADE II**

- 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

## Ottawa Ankle rules



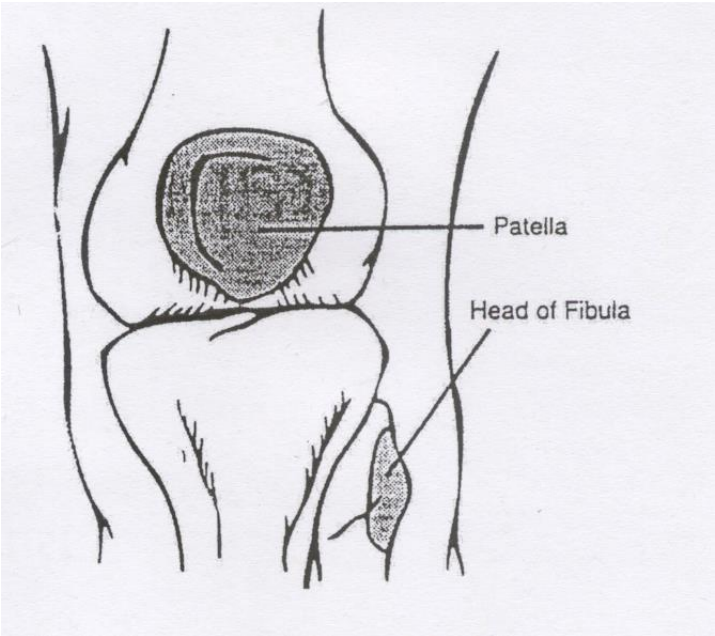

**Ankle X-ray required if:**

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**

## 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).**

# Wounds (see Hand Injuries, Immunization, 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 Langers 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) | |
| | | Steristrips - straight, tension free | 5 days |
| | | Sutures - 6'0, non-absorbable | 3-5days |
| | Scalp | Glue - superficial, <3 cm, straight, tension free | |
| | | Sutures - 3'0 non-absorbable | 7 days |
| | | Staples | 7 days |
| | Over joints | Sutures - 3'0 and 4'0 | 10-14 days |
| | Hands | 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 | 6-8 weeks |
| | | Dynacast / elastoplast strapping for 2-3 days | 2-3 mths |
| | Knee | Grade 1 tear - DTG / Arthropad (2-3 days) | 6-8 weeks |
| | | Grade 2 tear - DTG / Arthropad (consider physio) | |
| | | Grade 3 tear - cast/ knee brace & d/w RVH | |
| | Wrist | DTG for 4-6 weeks | 6-8 weeks |
| | | Futuro splint for 2 weeks then DTG | |
| 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) | 2-4 weeks |
| | | If opening, to plastics ASAP | |
| 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.

**Patients with UF or RF 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 by the diversionary OT and nurse.**

## Domestic Violence

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.

Elder abuse and abuse of other vulnerable adults is under-diagnosed. The principles of are the same as those for 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.

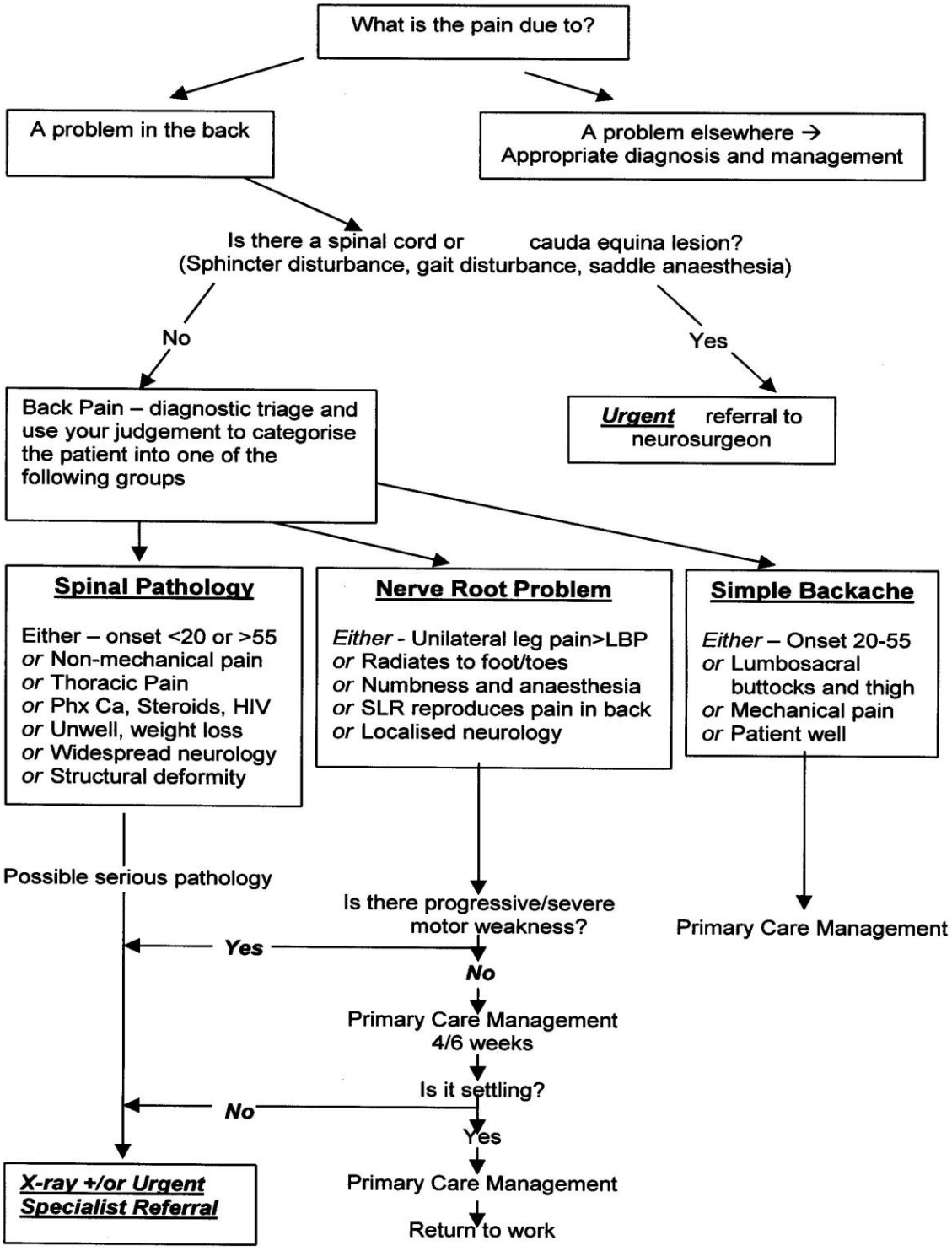
## Low Back Pain

Current national guidelines for the management of low 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 an orthopaedic back surgeon

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
CESI- an incomplete lesion
Impairment of bladder/saddle sensation and difficulty with micturition, but the patient remains continent

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". Patients who self refer with gynae complaints should be seen and then referred to EPaC or their GP urgently unless admission is indicated (see next page)*

Patients commonly self refer or come with GP letter because of bleeding in early pregnancy. 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. of a pregnant

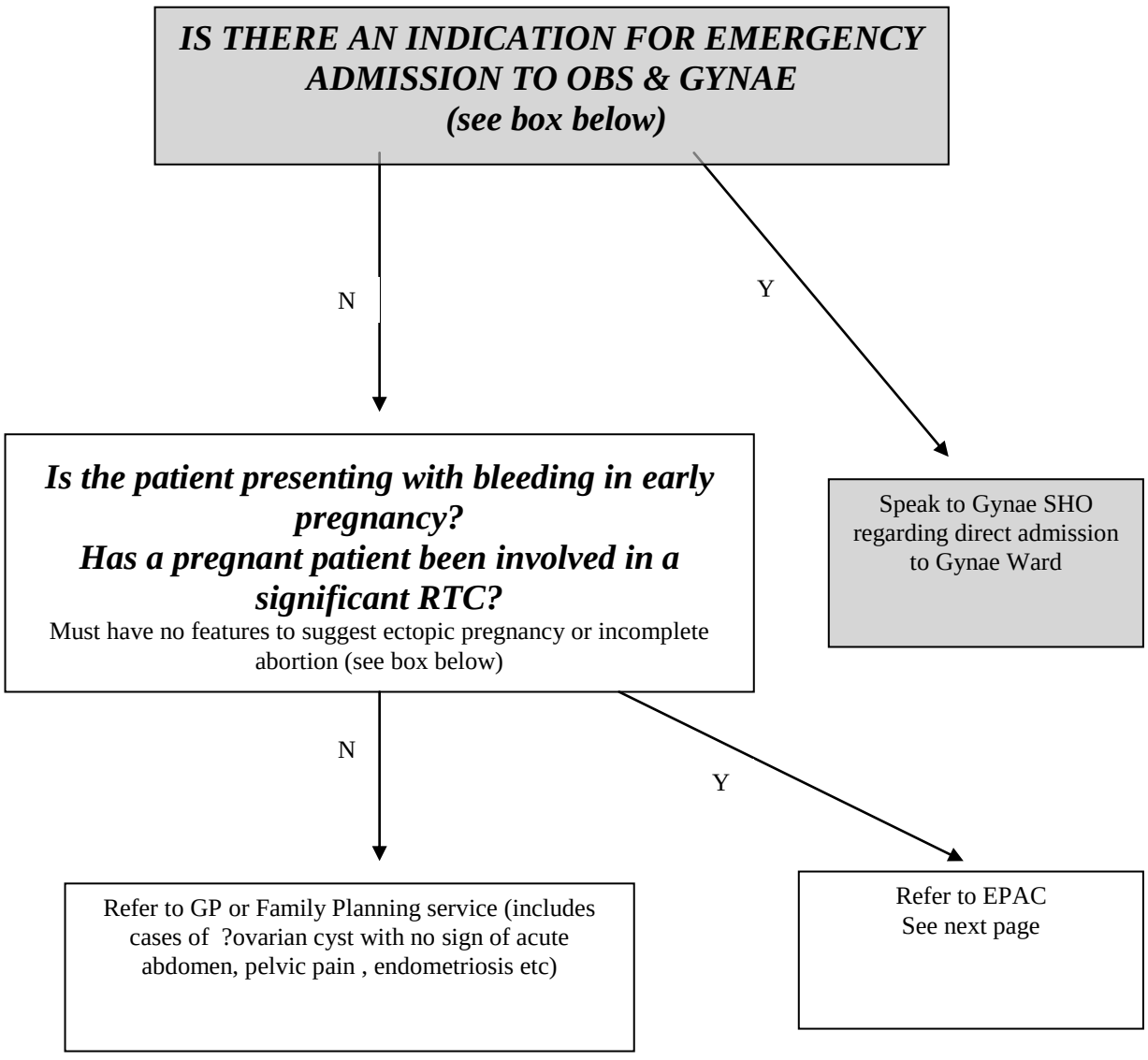
Other patients with threatened miscarriage will be triaged to the procedure room in Majors They can usually be treated solely by the Emergency Department team and followed up at EPAC.

- 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. A pathway for Obs & Gynae patients follows.

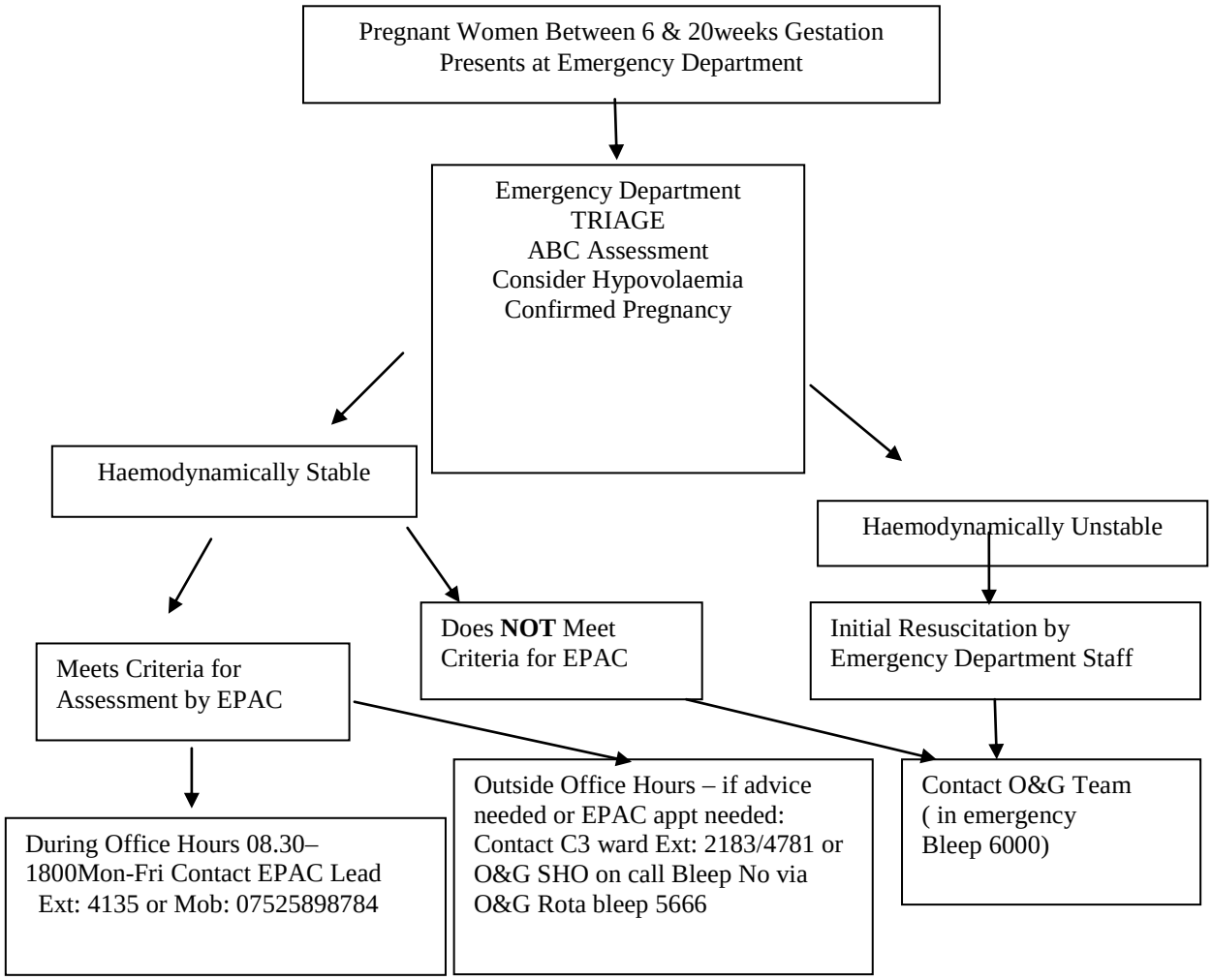
# PATHWAY FOR OBS & GYNAE PATIENTS

# PRESENTING TO THE EMERGENCY DEPARTMENT




*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




**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. Effectiveness diminishes with delay-
95% effective at 24hrs, 85% at 25-48 hrs and 58% effective at 49-72 hrs.
Take a menstrual history and ask about previous unprotected sex within same cycle. Seek advice if complicated case.

PCC of choice is levonorgestrel. It is contra-indicated if there is a history of liver disease or porphyria and if urine HCG is positive.

**Levonelle-2 750mcg immediately**
**Levonelle-2 750mcg 12 hours after first dose**

Explain

- Next period may be early or late and that treatment failure may occur
- Barrier method of contraception used until next period
- Attend GP if lower abdominal pain, grossly abnormal period or no period.

All patients who receive PCC in the Emergency Department should be given written family planning advice (available in Triage) and advised to attend their FPC or GP.
Patients aged 14 years or under must be assessed Gillick competent and discussed with the consultant on call.

*The accepted legal and medical view is that Hormonal Emergency Contraception is not a method of abortion. However, doctors who have moral objections to the morning after pill have the right not to prescribe it. Where possible, they should not become involved with the case at all but ask a colleague to see the patient instead of them. Patients must not be refused treatment -contact the consultant on call in the event of problems.*

## Pain Relief for Adults

PAIN SCORING CAN HELP ASSESS THE NEED FOR ANALGESIA AND THE PATIENT's RESPONSE. Full information is available in the triage cubicle but here is a 'rule of thumb'
Mild: 3
Moderate:6
Severe:9

***People in severe pain require iv opiate analgesia with an anti-emetic <u>immediately</u> -***

- **<u>Immediate short-term pain relief (all ages)</u>:**
  **Entonox via *self-administration* mask from Blue& White–shouldered cylinder.**
  **Contra-indicated if chest trauma or altered level of consciousness – don't use simultaneously with iv pain relief or sedation**

- **<u>Adults:</u>**
  **Morphine 10mg iv increasing up to 15mg+ if necessary and topping up every 20 mins**
  **with 2-5ml aliquots to maintain effect**

- **<u>Elderly:</u>**
  **Dilute the adult dose in a *total* volume of 10 mls water.**
  **Give in 2.5mg aliquots slowly iv until satisfactory pain relief is obtained. Remember that the full effect of an iv injection takes longer to develop in the elderly.**

- **<u>Cardiac pain:</u>**
  **Diamorphine 5mg iv repeated if necessary**

- **<u>Renal Colic</u>**
  **Diclofenac 50mg PR (or 75mgim if patient prefers)**

- **<u>Very severe headache</u>**
  **Codeine Phosphate 45mg im**

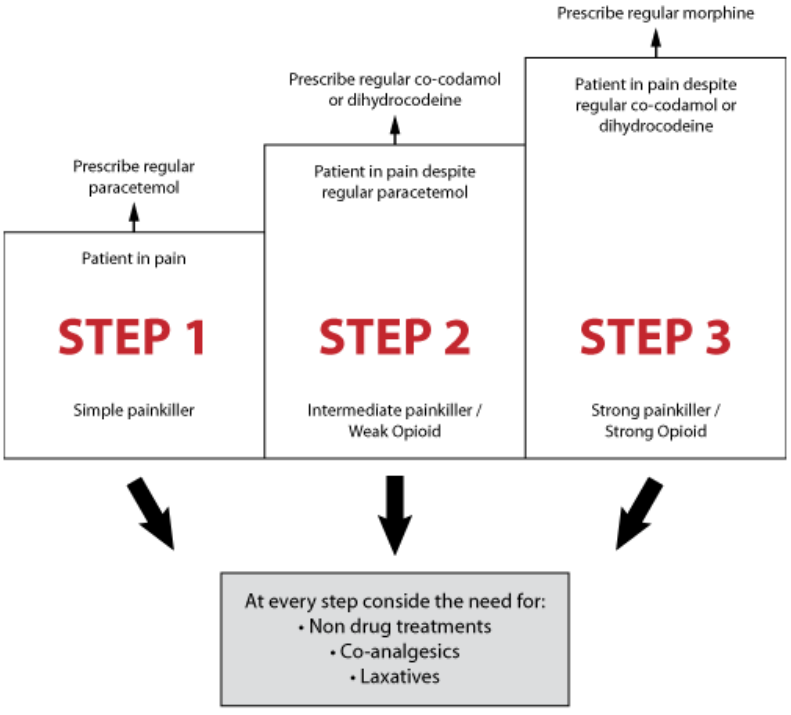
- **<u>Fractured femoral shaft</u>**
  **– Femoral Nerve Block with levo-bupivacaine (chirocaine) 0.5% 10mls**
  **(ask for senior help if you cannot do this procedure)**

***If iv analgesia hasn't worked - give half as much again slowly and keep incrementing until pain relief obtained.***

# Pain Relief Prescribing – Emergency Department Pain Packs

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




**This department prescribes analgesia in pain packs. These have been formally agreed within the hospital and within the community.**
**NSAIDs may inhibit fracture healing and should NOT be prescribed for fracture patients.**

## Intravenous Sedation – Guidelines for Reduction under Sedation (see Fractures, Shoulder and Clavicle, Wrist)

Intravenous sedation is used extensively in the management of simple fractures and dislocations. It is also occasionally employed during our minor ops lists. *The use of iv sedation incurs considerable responsibility and the sedationist must follow the guidelines below meticulously*. Procedures under iv sedation should never be undertaken by inexperienced doctors or when there is doubt about the patient's safety for any reason.
Never combine iv sedation with nitrous oxide – this is classified as general anaesthesia!

Stage One: Assessing the patient's suitability
Take a history from the patient, list allergies and medications and examine cardiovascular and respiratory systems. This should enable you to assign the patient to an "ASA" class as defined below.

**The American Society of Anaesthesiologists**
**Classification of physical status**
**Class I**
**The patient has no organic, physiological, biochemical or psychiatric disturbance. The pathological process for which surgery is to be performed is localised and does not entail a systemic disease. Examples: a fit patient with an inguinal hernia, a fibroid uterus in an otherwise healthy woman.**
**Class II**
**Mild to moderate systemic disease caused either by the condition to be treated surgically or by other pathophysiological processes. Examples: non or only slightly limiting organic heart disease, mild diabetes, essential hypertension or anaemia. The extremes of age may be included here, even though no discernible disease is present. Extreme obesity and chronic bronchitis may be included in this category.**
**Class III**
**Severe systemic disturbance or disease from whatever cause, even though it may not be possible to define the degree of disability with finality. Examples: severely limiting organic heart disease, severe diabetes with vascular complications, moderate to severe degrees of pulmonary insufficiency, angina pectoris or healed myocardial infarction.**

**Classes IV and V - Life-threatening conditions**

Only patients in Class I or Class II should be considered for Emergency Department sedation. You will note that the classes are quite broad and that your judgement will be required - err on the side of caution. Seek advice from the on-call anaesthetist if necessary. Children under the age of 13 should not receive iv sedation in the Emergency Department and young people aged 13-16 should only be sedated with senior Emergency Department or anaesthetic supervision.
Patients undergoing sedation must have fasted for at least four hours.

**Some reductions can be deferred until the next morning (e.g. if the patient has been drinking, if they are not fasting, if only one doctor is available). Such patients may be admitted or allowed home to return on the following morning. Arrange to enter the patient's name, Emergency Department number, procedure and ASA class the Nurses' Diary. Give notes and x-rays to the nurse in charge and ensure that the patient is asked to come back fasting at 10.00 am. Ensure that Steps Two prior to discharge.**

**Patients who are unsuitable for iv sedation in Emergency Department should be discussed with the fractures team on call.**

Stage Two: Devising a safe discharge plan

A competent adult carer should be identified and this individual *must* be given a copy of the white "Advice for patients following iv Sedation" leaflet with the anticipated recovery time completed (four hours after sedation). If a satisfactory discharge plan cannot be devised care arrangements should be made with Social Services in advance, for example Nursing Home placement is often required for the elderly.

Stage Three: Ensuring the safety of the procedure

Intravenous sedation mandates the full time presence of a dedicated sedation nurse and a doctor. The doctor can be responsible for both procedure and sedation but another doctor must be present in Emergency Department in case an emergency arises in the department.

**The following equipment must be to hand before the procedure is commenced -**

- **bag-valve-mask with O2 tubing attached**
- **Guedel airway**
- **anaesthetic machine with oxygen on at 10 litres/min**
- **suction on**
- **SaO2 monitor**
- **ECG**
- **BP cuff**
- **full oxygen cylinder under patient's trolley with 100% oxygen mask attached**
- **Naloxone (Narcan)**

Stage Four: Obtaining consent

The patient must sign the white consent form for the procedure and the sedation, e.g. "Reduction of Colles' fracture right wrist under iv sedation". Consent must be fully informed and the patient deemed competent to provide this. A patient under the age of 16 should not be permitted to consent for iv sedation irrespective of "Gillick-competency".

Stage Five: The Procedure

- The patient should be pre-oxygenated with 100% oxygen for 10 minutes
- ECG, SaO2- monitor and BP cuff in situ
- X-ray should be informed that a portable check film will soon be required
- Midazolam, and propofol are the commonest iv sedation agents used in this unit

PAIN RELIEF AND SEDATION

- **When patient is unresponsive to voice the procedure can commence**

- Patient will often respond to the painful stimulus and a *small amount* of additional midazolam may be required (note that rendering a patient completely unresponsive to pain amounts to a general anaesthetic and this is not permitted!)
- Procedure should be discontinued immediately if oxygen saturation falls below 92% and attention paid to the airway

Stage Six: Post-operative Care

Following the procedure the patient should have a supervised recovery period, no less than four hours. *They can move to the observation ward to complete this*

**Patients are deemed to have recovered when vital signs are stable, they can walk without support, they can drink fluids and have passed urine.**

You should write the procedure up on operation notes form that is then filed in the Emergency Department notes. The write-up should include the anaesthetic assessment, sedation and monitoring. You must comment on the check x-ray appearance.

Clear post-op instructions should be listed including the recovery criteria above, that the plaster should be split, what follow-up is required and what analgesia should be dispensed.

**Levels of Sedation**

**Sedation is a continuum and your patient's score may rise or fall. Expect sedation to deepen when you have finished your procedure – close monitoring is needed for at least ten minutes.**

| | |
|---|---|
| **Level 1** | **Anxious, agitated or restless** |
| **Level 2** | **Co-operative, orientated and tranquil** |
| **Level 3** | **Responds to commands** |
| **Level 4** | **Asleep but brisk response to glabellar tap or shout** |
| **Level 5** | **Asleep with sluggish response to glabellar tap or shout** |
| **Level 6** | **No response** |

**Target for most procedures is 3-4**

# Paediatric

# Pages

## Paediatric Clinical Guidance

1) Resusitation — Paediatric Triage Tool
   - ABC assessment of Seriously Ill Child
   - Transfers to ward
   - Basic Paediatric Life Support
   - Choking Child
   - Advanced Paediatric Cardiac Arrest
   - Cardiac Arrhythmia
   - VT with Pulse
   - Seizure
   - Newborn Life Support
   - Anaphylaxis
   - Unconscious Child
   - Sudden Unexplained Infant Death

2) Infectious Disease & Rashes

3) Assessing pyrexia

4) Paediatric Gastroenterology & Fluid Balance

5) Paediatric DKA

6) Respiratory
   - Asthma
   - Bronchiolitis

7) Injury & MSK
   - Includes Major Trauma
   - NAI
   - Head injury
   - Limping child
   - Clavicle Fractures

## Emergency Department Paediatric Triage Protocol

**All children undergoing triage or receiving treatment in an Emergency Department cubicle must be taken to the resuscitation room immediately if they have any of the following:**

| | |
|---|---|
| **Appearance:** | **Pale, cyanosed or non-blanching rash** |
| **Consciousness:** | **Listless, fitting or unresponsive** |
| **Respiration:** | **Irregular or laboured**<br>**Respiratory rate >40 or <8 per minute** |
| **Pulse:** | **Irregular, <60 or >130** |
| **CRT:** | **Capillary refill >3 seconds** |

## ABC – Seriously Ill Child

***Dial 6666 and ask for the paediatric team***
***Appear calm and give 100% oxygen!***

**These are general guidelines for commencing resuscitation until paediatric team leader or Emergency Department consultant arrives**

1. ***Bring to paediatric resus (allow parents to accompany)***
2. ***Assess consciousness, airway, breathing, circulation*( all the usual 'ABC' assessment methods apply)***
3. ***Give 100% O2 (use 100% O2 mask or if necessary bag-valve-mask attached to O2)***
4. ***Get iv or intra-osseous access (don't delay with multiple iv attempts)***
5. ***Take blood (BM stick, blood cultures etc.)***
6. ***Calculate weight ( wt/kg = 2x(Age + 4) )***
7. ***Push 10ml/kg normal Saline into your line via syringe (Omit if cardiac disease or suspected CHF). Repeat 3times. Can give 60ml/kg***
8. ***Give 5ml/kg of 10% Dextrose if hypoglycaemic by iv push.***
   ***DO NOT USE IN SHOCK.***
9. ***Treat sepsis empirically with cefotaxime 100mg/kg (max2g)slow iv (if meningococcal septicaemia likely, Ceftriaxone 80mg/kg (max2-4g) slow iv***

*****DO NOT TOUCH A CONSCIOUS CHILD WITH STRIDOR. IF YOU SUSPECT EPIGLOTTITIS OR PARTIAL AIRWAY OBSTRUCTION OF ANY KIND DON'T TOUCH THE CHILD AT ALL UNLESS RESPIRATORY ARREST - GET ANAESTHETIST IMMEDIATELY*****

## ABC – Seriously Ill Child TRANSFERS TO THE WARD

**The following conditions require supervised transfer with an appropriately trained and experienced nurse or doctor to the Paediatric ward.**

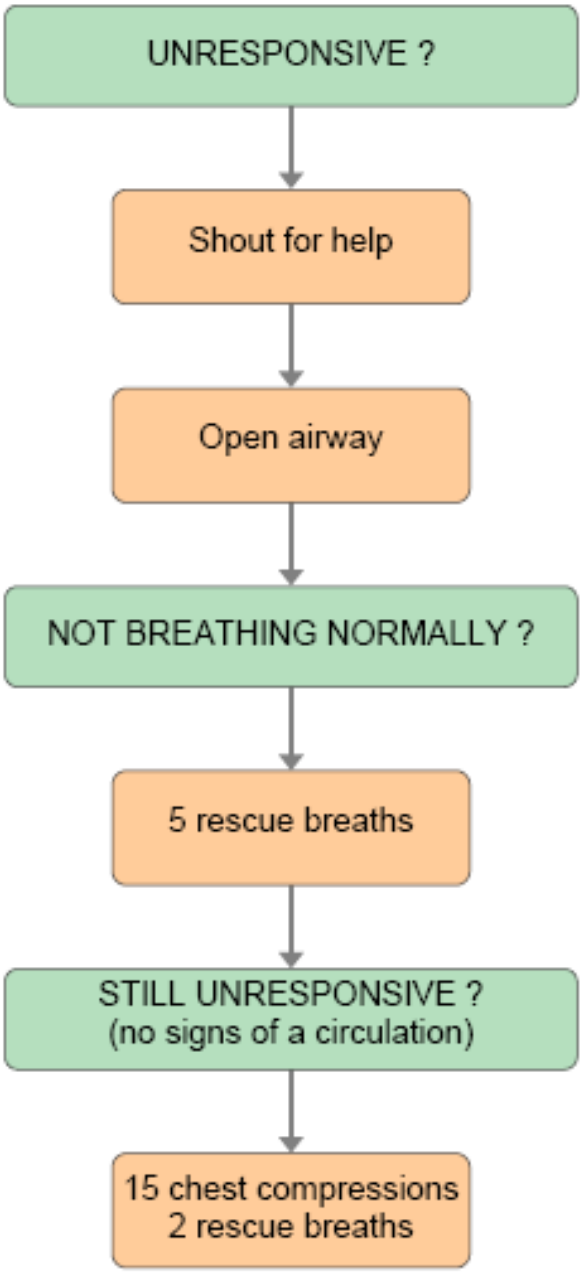
**The relevant paediatric doctor on call must be made aware of your concerns about the child.**

- **Cap refill >2 seconds (inform paeds reg, needs fluids (0.9%NaCl) given prior to transfer)**
- **Altered GCS – drowsy, lethargic, loss of eye contact with parents or irritable (inform paeds reg )**
- **Non-blanching rash (inform paeds reg )**
- **Increased or decreased respiratory rate / abnormal SaO2, less than 95% (inform paeds reg, transfer with O2)**
- **Any suspicion of upper airway obstruction(inform paeds reg +/- anaesthetist)**
- **Pale, toxic or unwell looking child (inform paeds reg )**
- **Serious parental concern**
- **Bad medical history**

# Basic Paediatric Life Support

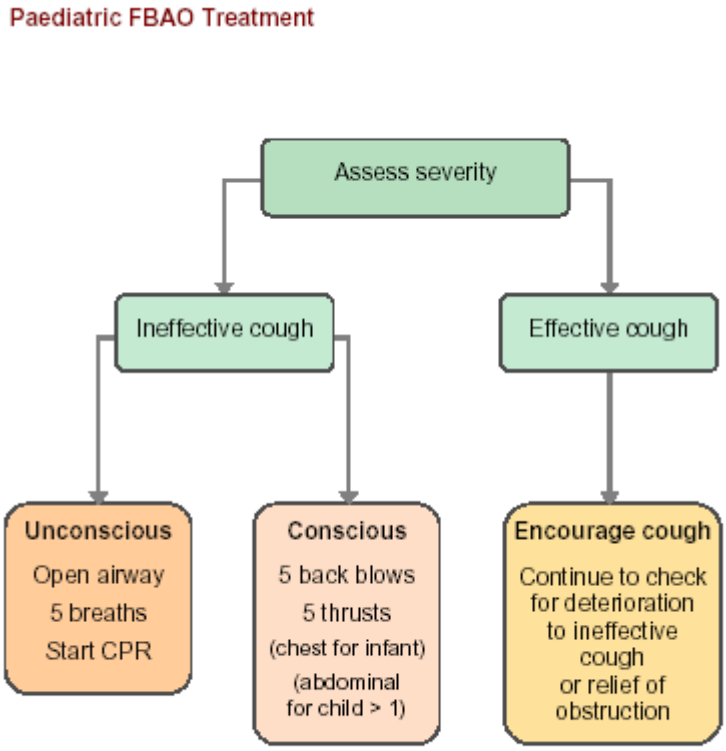
## Paediatric Basic Life Support

(Healthcare professionals
with a duty to respond)

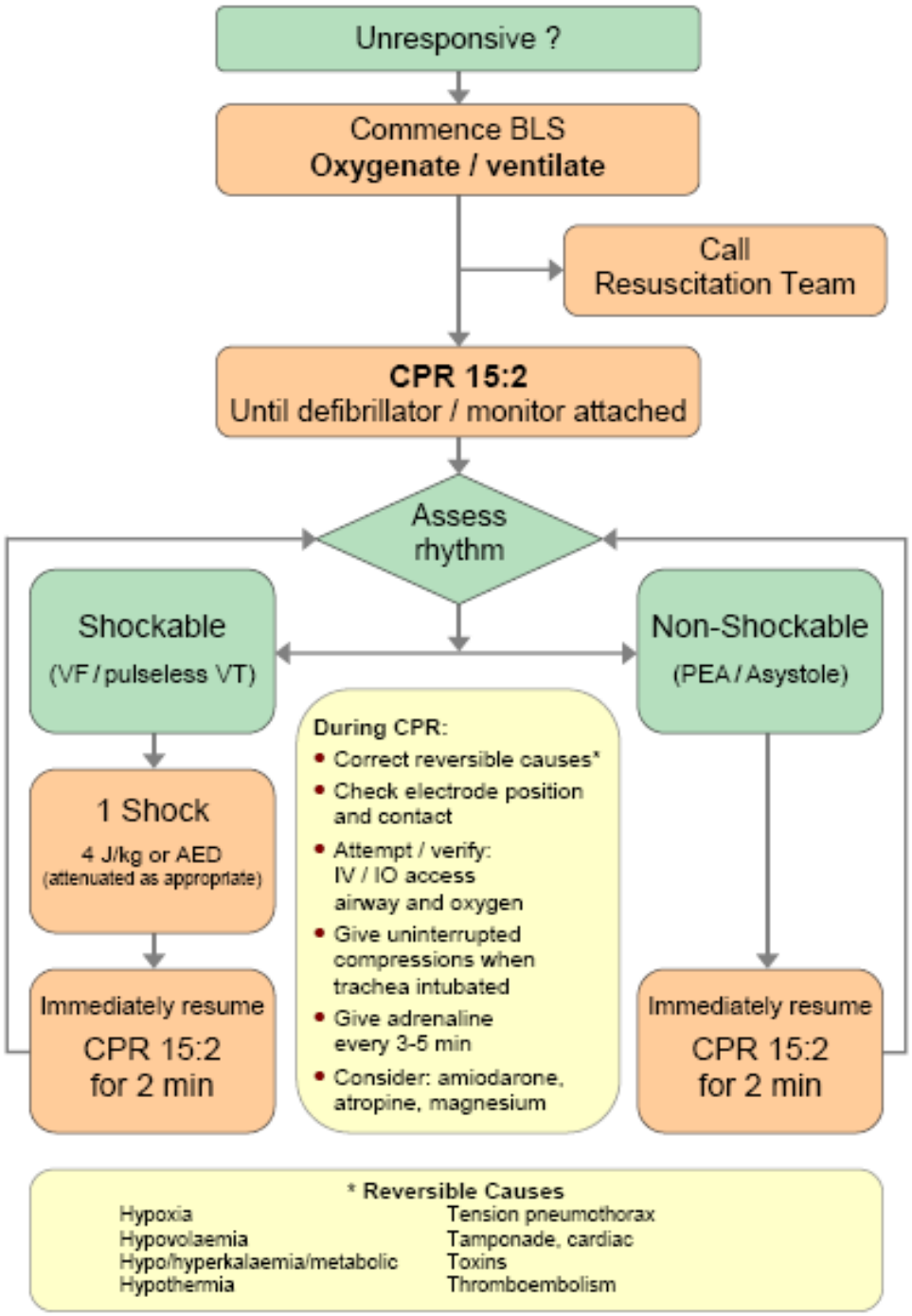



After 1 minute call resuscitation team then continue CPR

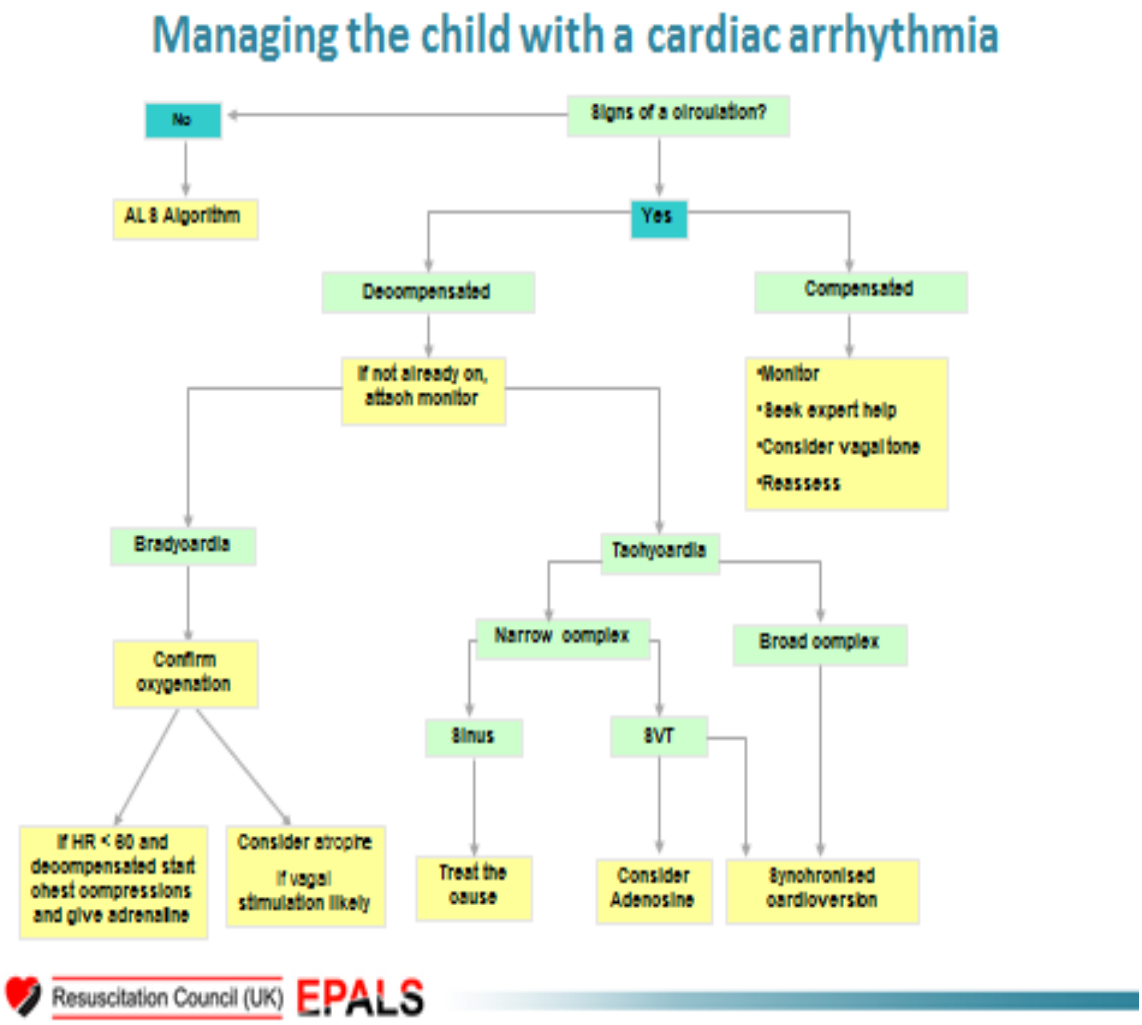
# Advanced Paediatric Life Support: Choking child



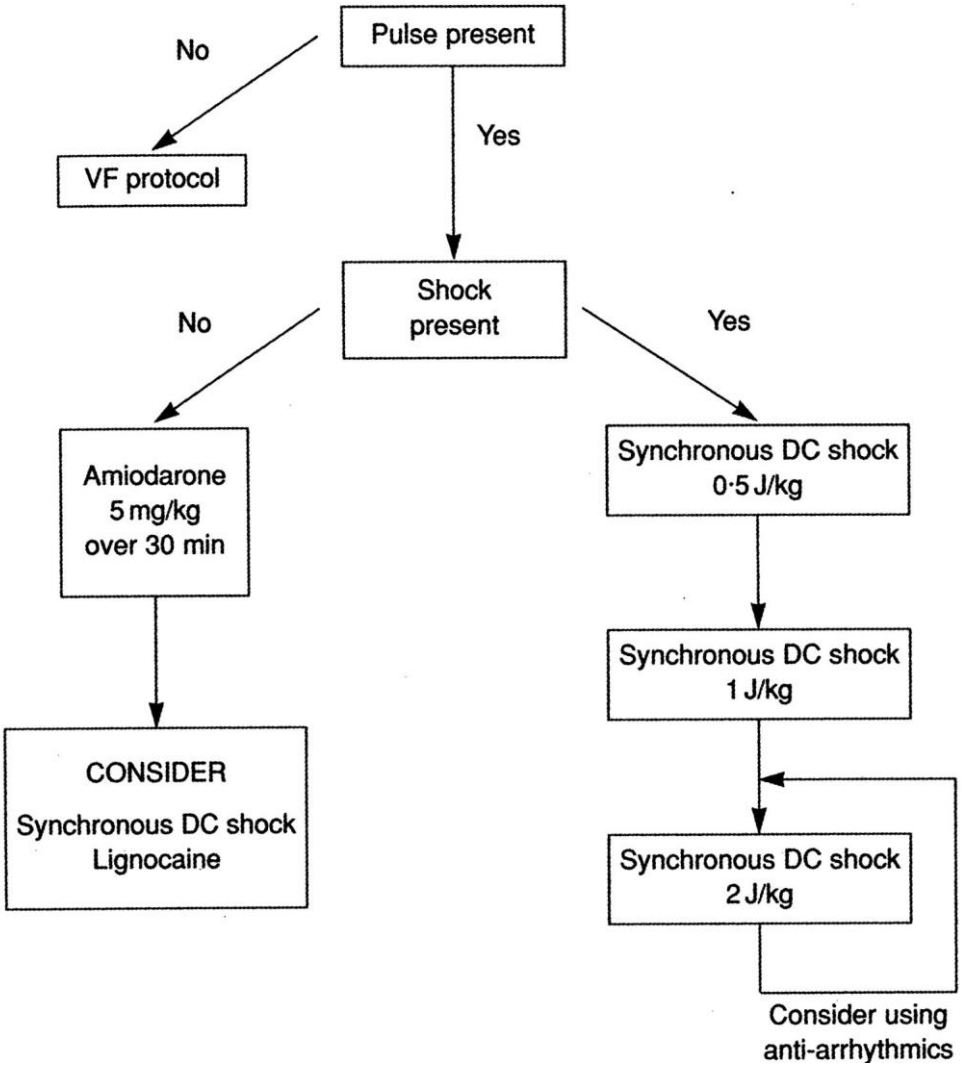
# Advanced Paediatric Life Support: cardiac arrest

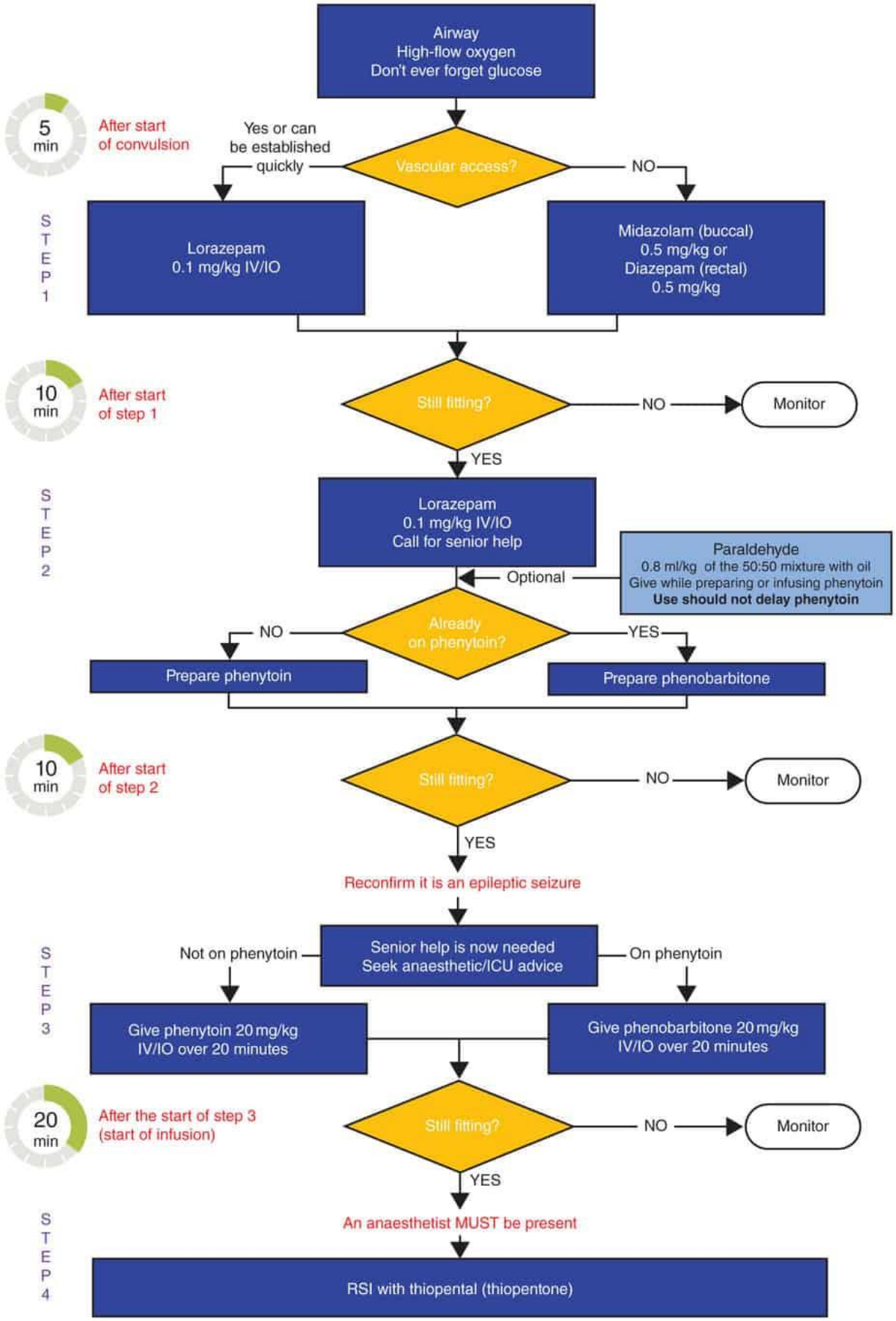


# Advanced Paediatric Life Support: ARRHYTHMIA



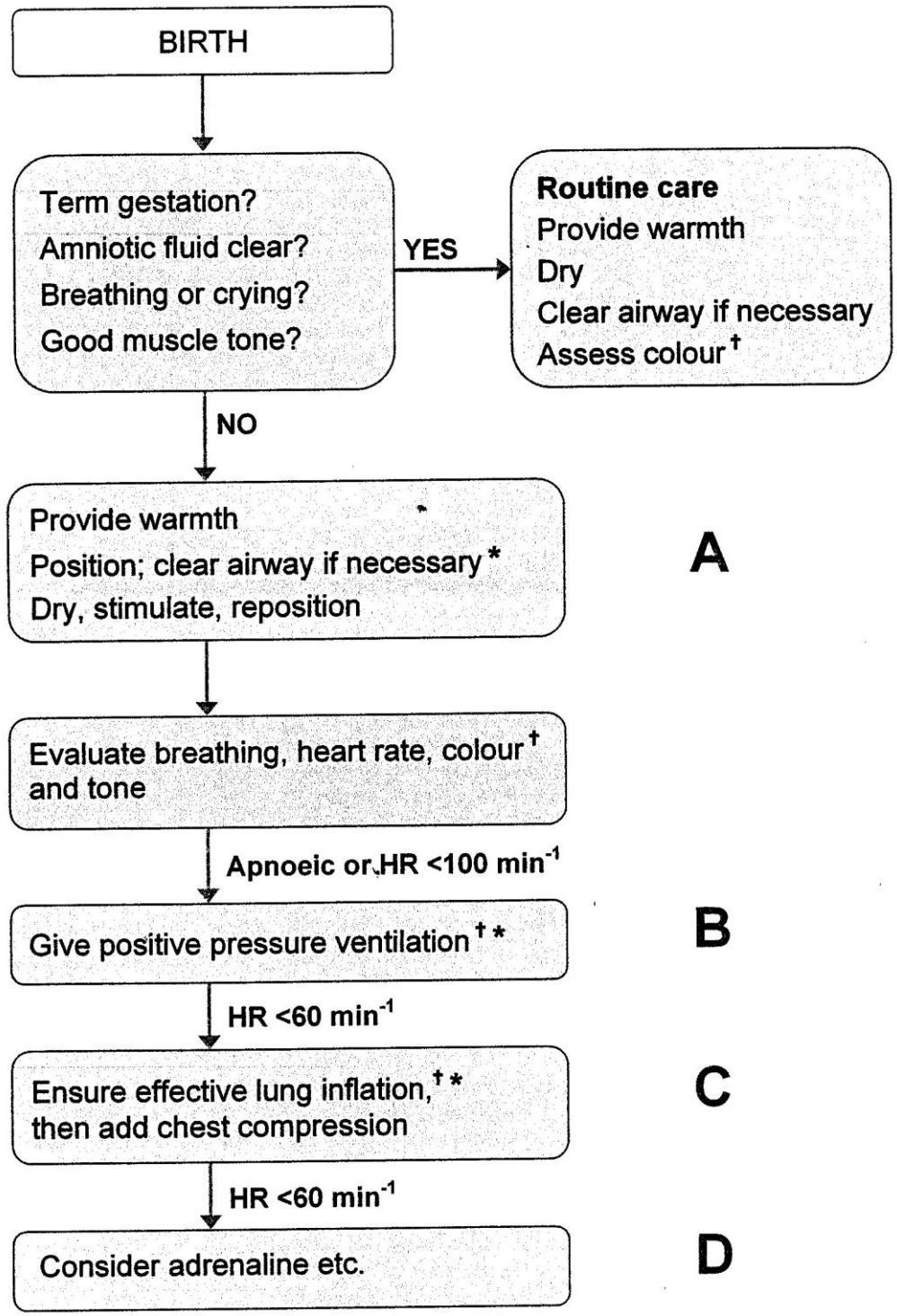
# Advanced Paediatric Life Support: Ventricular tachycardia




Airway
High-flow oxygen
Don't ever forget glucose
5 min
After start of convulsion
Yes or can be established quickly
Vascular access?
NO
STEP 1
Lorazepam
0.1 mg/kg IV/IO
Midazolam (buccal)
0.5 mg/kg or
Diazepam (rectal)
0.5 mg/kg
10 min
After start of step 1
Still fitting?
NO
Monitor
YES
STEP 2
Lorazepam
0.1 mg/kg IV/IO
Call for senior help
Optional
Paraldehyde
0.8 ml/kg of the 50:50 mixture with oil
Give while preparing or infusing phenytoin
Use should not delay phenytoin
Already on phenytoin?
NO
YES
Prepare phenytoin
Prepare phenobarbitone
10 min
After start of step 2
Still fitting?
NO
Monitor
YES
Reconfirm it is an epileptic seizure
STEP 3
Not on phenytoin
Senior help is now needed
Seek anaesthetic/ICU advice
On phenytoin
Give phenytoin 20 mg/kg
IV/IO over 20 minutes
Give phenobarbitone 20 mg/kg
IV/IO over 20 minutes
20 min
After the start of step 3 (start of infusion)
Still fitting?
NO
Monitor
YES
STEP 4
An anaesthetist MUST be present
RSI with thiopental (thiopentone)

# Advanced Paediatric Life Support : Newborn Life Support

## Newborn Life Support




* Tracheal intubation may be considered at several steps

† Consider supplemental oxygen at any stage if cyanosis persists

# Advanced Paediatric Life Support : Anaphylaxis

## Anaphylaxis algorithm

**Anaphylactic reaction?**

**Airway, Breathing, Circulation, Disability, Exposure**

**Diagnosis** - look for:
- Acute onset of illness
- Life-threatening Airway and/or Breathing and/or Circulation problems [1]
- And usually skin changes

- **Call for help**
- Lie patient flat
- Raise patient's legs

**Adrenaline** [2]

**When skills and equipment available:**
- Establish airway
- High flow oxygen
- IV fluid challenge [3]
- Chlorphenamine [4]
- Hydrocortisone [5]

**Monitor:**
- Pulse oximetry
- ECG
- Blood pressure

---

**[1] Life-threatening problems:**

| | |
|---|---|
| **Airway:** | swelling, hoarseness, stridor |
| **Breathing:** | rapid breathing, wheeze, fatigue, cyanosis, $SpO_2$ < 92%, confusion |
| **Circulation:** | pale, clammy, low blood pressure, faintness, drowsy/coma |

**[2] Adrenaline** *(give IM unless experienced with IV adrenaline)*
IM doses of 1:1000 adrenaline (repeat after 5 min if no better)

| | |
|---|---|
| • Adult | 500 micrograms IM (0.5 mL) |
| • Child more than 12 years: | 500 micrograms IM (0.5 mL) |
| • Child 6 -12 years: | 300 micrograms IM (0.3 mL) |
| • Child less than 6 years: | 150 micrograms IM (0.15 mL) |

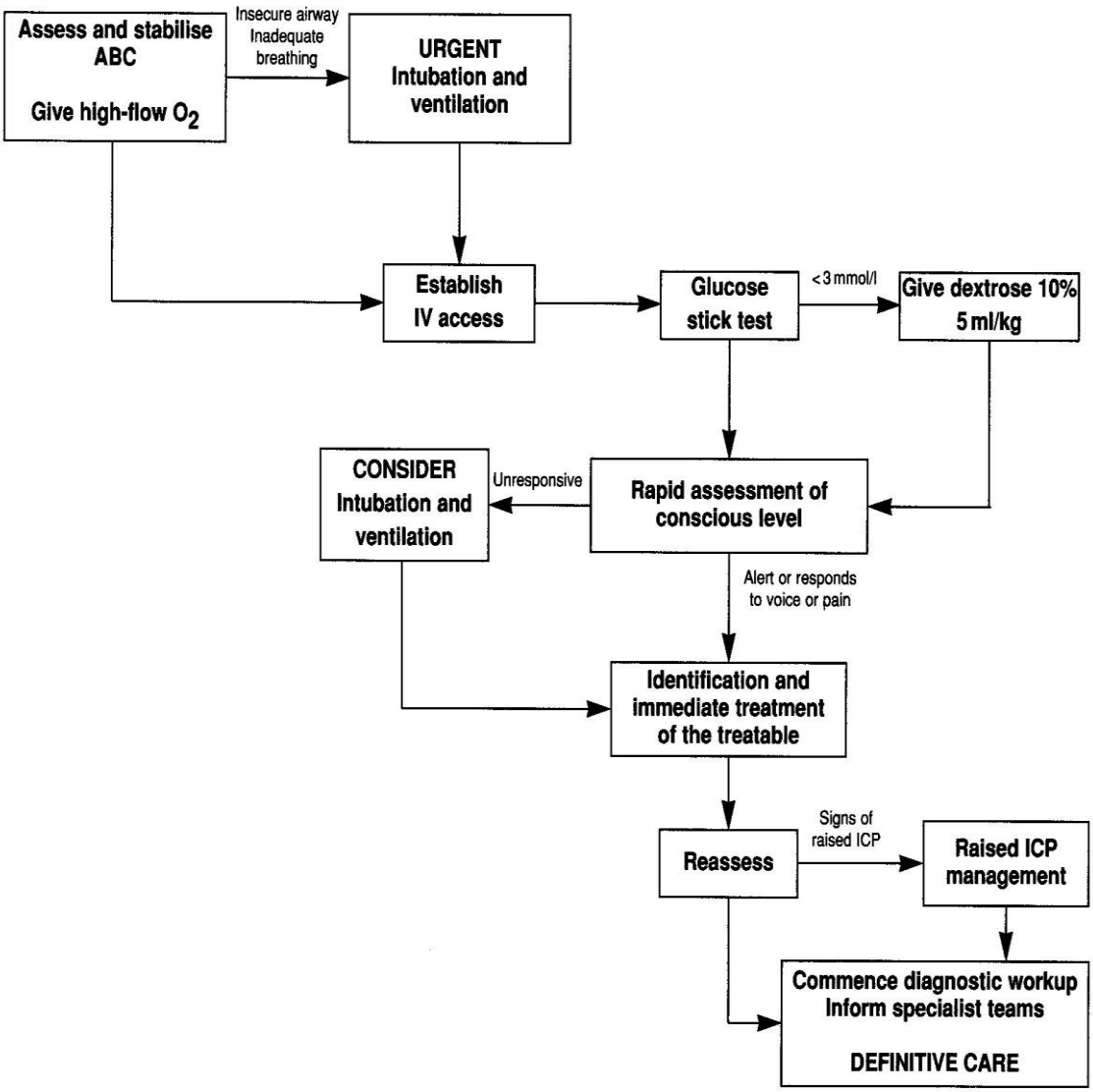
Adrenaline IV to be given only by experienced specialists
Titrate: Adults 50 micrograms; Children 1 microgram/kg

**[3] IV fluid challenge:**
Adult - 500 – 1000 mL
Child - crystalloid 20 mL/kg

Stop IV colloid
if this might be the cause
of anaphylaxis

| | [4] Chlorphenamine (IM or slow IV) | [5] Hydrocortisone (IM or slow IV) |
|---|---|---|
| Adult or child more than 12 years | 10 mg | 200 mg |
| Child 6 - 12 years | 5 mg | 100 mg |
| Child 6 months to 6 years | 2.5 mg | 50 mg |
| Child less than 6 months | 250 micrograms/kg | 25 mg |

# The Unconscious Child




Algorithm for the initial management of coma

# Sudden Unexpected Death in Infancy (SUDI)

***This will present to you as cardio-respiratory arrest in an infant.***

**You must get senior Paediatric help immediately in this situation 8-3333#**

**If the baby has rigor mortis or skin changes (stasis) pronounce death but get help.**

**If not commence CPR with $O^2$ until paediatric registrar or a consultant arrives.**

**The patient (Paediatric Registrar)**
**The paediatric registrar will follow the agreed protocol for the investigation of SUDI.**
**This protocol is in the SUDI pack which the registrar will have.**
**The pack is kept on A2 and can only be used by the paediatric registrar.**

**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**
- **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 parents should be allowed to hold their child for as long as they wish**

**The Coroner**
**A message must be left on the Coroner's answer phone including the name and <u>personal contact number</u> of the doctor who pronounced life extinct.**

**GP, HEALTH VISITOR AND SOCIAL WORKER MUST BE CONTACTED IN ALL CASES.**

# Meningococcal Septicaemia – Children

***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 help**

**Administer IV ceftriaxone 80mg/kg– (max 2-4g, over 2-4min)**
**(Can also consider cefotaxime 100mg/kg (max 2g) and benzylpenicillin 50mg/kg (max 2g) ).**

**The meningoccal packs are in the paediatric resus area.**

**Do not send PCR from the Emergency Department**

# Rashes – Children (see Ill child)

- ***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(GTA)***

***Colour textbooks are invaluable:***

- **Clinical Dermatology Illustrated (Patient advice leaflets are available for photocopying)**
- **A Regional Approach : Reeves**

**Key Facts are given in the table below**

| *Condition* | *Organism* | *Clinical Presentation* | *Treatment* |
|---|---|---|---|
| Impetigo | Group A Strep | Vesicles becoming unroofed<br>Honey crust | Polyfax<br>Fucidin Ointment<br>(Oral Fluclox) |
| Mild Cellulitis | Strep or Staph | Warm, red, swelling | Co-Amoxiclav |
| Severe cellulitis | " | Above +Systemic illness or periorbital involvement | ADMIT FOR IV TREATMENT OR IV NURSES |
| Erythema Multiforme | | Target lesions incl. Palms & sole | Supportive |
| Stevens Johnson Syndrome | | Above + mucous membrane | ADMIT |
| Urticaria | Allergic Reaction | "Hives" or nettle rash | 1% HC cream |
| Drug Eruption | | Any rash + drug Hx | |

| | | | |
|---|---|---|---|
| **Scabies** | **Scarcoptes scabeii** | **Papules or nodules esp flexor creases<br>Burrows between fingers** | **Malathion or Permethrin<br>+Advice sheet from Cl Derm Ill.** |
| **Fifth Disease** | **Parvovirus** | **Slapped Cheek** | |
| | | | |
| **Kawasaki Syndrome** | | **Erythema, sick, conjunctivitis, mucositis, peeling from fingers or toes** | **ADMIT** |
| **Toxic Shock Syndrome** | **Staph** | **Erythema, watery diarrhoea, shock** | **Flucloxacillin** |
| **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<br>Mouthwash** |
| **Post-primary “** | **“** | **Cold sores, lip ulcers** | **Acyclovir<br>Mouthwash** |
| **NAI** | | **Bizarre marks, burns** | **Child protection guidelines** |
| **Meningococcal** | | **Non-blanching rash<br>*May be extremely subtle at first*** | **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 pyrexic 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.**
- **Children less than 90 days old and unwell children/pyrexia >39°C should have topical anaesthetic cream applied in triage as white cell count will be needed later.**
- **Talk to the child's parents and listen to what they tell you.**
- **Look at the child and record whether they are well/unwell/playing/listless, etc.**
- **Record cap refill (e.g., CRT <2secs), $SaO_2$, respiratory rate and temperature.**
- **Look everywhere for a non-blanching rash. If a purpuric rash is found – even one spot – treat as meningococcal disease and follow the meningococcal protocol. Don't forget that a significant proportion of MCD cases have no rash or a vague blanching rash.**
- **Carry out a good head-to-toe examination including most importantly an ENT examination, since the commonest cause of pyrexia will be an upper respiratory tract infection (but remember that red ear drums may be due to a high temperature or crying).**
- **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 $SaO_2$.**

**Admitting or discharging:**

- **Less than 28 days old – *admission is always mandatory.***
- **28 days to 90 days – if temperature responding, white cell count <15,000 and chest X-ray normal, they can be discussed with the paediatric registrar to assess suitability for discharge.**
- **Older than 90 days – assessment becomes more reliable so children older than three months may be discharged by the Emergency Department doctors if well.**

*The bottom line is if you are worried or if the child looks unwell admit.*

**Table 1 Traffic light system for identifying likelihood of serious illness**

| | Green – low risk | Amber – intermediate risk | Red – high risk |
|---|---|---|---|
| Colour | • Normal colour of skin, lips and tongue | • Pallor reported by parent/carer | • Pale/mottled/ashen/blue |
| Activity | • Responds normally to social cues<br>• Content/smiles<br>• Stays awake or awakens quickly<br>• Strong normal cry/ not crying | • Not responding normally to social cues<br>• Wakes only with prolonged stimulation<br>• Decreased activity<br>• No smile | • No response to social cues<br>• Appears ill to a healthcare professional<br>• Unable to rouse or if roused does not stay awake<br>• Weak, high-pitched or continuous cry |
| Respiratory | | • Nasal flaring<br>• Tachypnoea:<br>– RR > 50 breaths/minute age 6–12 months<br>– RR > 40 breaths/minute age > 12 months<br>• Oxygen saturation ≤ 95% in air<br>• Crackles | • Grunting<br>• Tachypnoea:<br>– RR > 60 breaths/minute<br>• Moderate or severe chest indrawing |
| Hydration | • Normal skin and eyes<br>• Moist mucous membranes | • Dry mucous membrane<br>• Poor feeding in infants<br>• CRT ≥ 3 seconds<br>• Reduced urine output | • Reduced skin turgor |
| Other | • None of the amber or red symptoms or signs | • Fever for ≥ 5 days<br>• Swelling of a limb or joint<br>• Non-weight bearing/ not using an extremity<br>• A new lump > 2 cm | • Age 0–3 months, temperature ≥ 38°C<br>• Age 3–6 months, temperature ≥ 39°C<br>• Non-blanching rash<br>• Bulging fontanelle<br>• Neck stiffness<br>• Status epilepticus<br>• Focal neurological signs<br>• Focal seizures<br>• Bile-stained vomiting |

CRT: capillary refill time
RR: respiratory rate

## Table 2 Symptoms and signs of specific diseases

| Diagnosis to be considered | Symptoms and signs in conjunction with fever |
|---|---|
| Meningococcal disease | Non-blanching rash, particularly with one or more of the following:<br>• an ill-looking child<br>• lesions larger than 2 mm in diameter (purpura)<br>• CRT ≥ 3 seconds<br>• neck stiffness |
| Meningitis[1] | • Neck stiffness<br>• Bulging fontanelle<br>• Decreased level of consciousness<br>• Convulsive status epilepticus |
| Herpes simplex encephalitis | • Focal neurological signs<br>• Focal seizures<br>• Decreased level of consciousness |
| Pneumonia | • Tachypnoea, measured as:<br>– 0–5 months – RR > 60 breaths/minute<br>– 6–12 months – RR > 50 breaths/minute<br>– > 12 months – RR > 40 breaths/minute<br>• Crackles in the chest<br>• Nasal flaring<br>• Chest indrawing<br>• Cyanosis<br>• Oxygen saturation ≤ 95% |
| Urinary tract infection (in children aged older than 3 months)[2] | • Vomiting<br>• Poor feeding<br>• Lethargy<br>• Irritability<br>• Abdominal pain or tenderness<br>• Urinary frequency or dysuria<br>• Offensive urine or haematuria |
| Septic arthritis/osteomyelitis | • Swelling of a limb or joint<br>• Not using an extremity<br>• Non-weight bearing |
| Kawasaki disease[3] | Fever lasting longer than 5 days and at least four of the following:<br>• bilateral conjunctival injection<br>• change in upper respiratory tract mucous membranes (for example, injected pharynx, dry cracked lips or strawberry tongue)<br>• change in the peripheral extremities (for example, oedema, erythema or desquamation)<br>• polymorphous rash<br>• cervical lymphadenopathy |

CRT: capillary refill time
RR: respiratory rate

[1] Classical signs (neck stiffness, bulging fontanelle, high-pitched cry) are often absent in infants with bacterial meningitis.
[2] Urinary tract infection should be considered in any child aged younger than 3 months with fever. See 'Urinary tract infection in children' (NICE clinical guideline, publication expected August 2007).
[3] Note: in rare cases, incomplete/atypical Kawasaki disease may be diagnosed with fewer features.

## Vomiting and Diarrhoea – The Dehydrated Child (see Seriously Ill Child, Triage, Pyrexic Child)

**Very ill children (see Paediatric Triage Protocol) should be taken to resuscitation immediately and paediatric registrar contacted. Follow shocked child protocol.**

**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:**

- **The triage/children's nurse will usually give a bottle of dioralyte to assess feeding.**
- **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 pyrexic child, remembering urine test.**
- **Following your history and examination, decide if dehydration is**
  **- mild (<5%), moderate (10%) severe (25%).**
- **For mild dehydration try a small bottle of dioralyte (if note already tried). Small volumes regularly spaced 5-10ml / 15-30 minutes. If tolerated can be discharged.**
- **Moderate to severe dehydration will need admission for parenteral fluids.**

**All infants who cannot feed must be admitted. Children with diarrhoea and vomiting will get dehydrated and be sicker than children with just diarrhoea.**

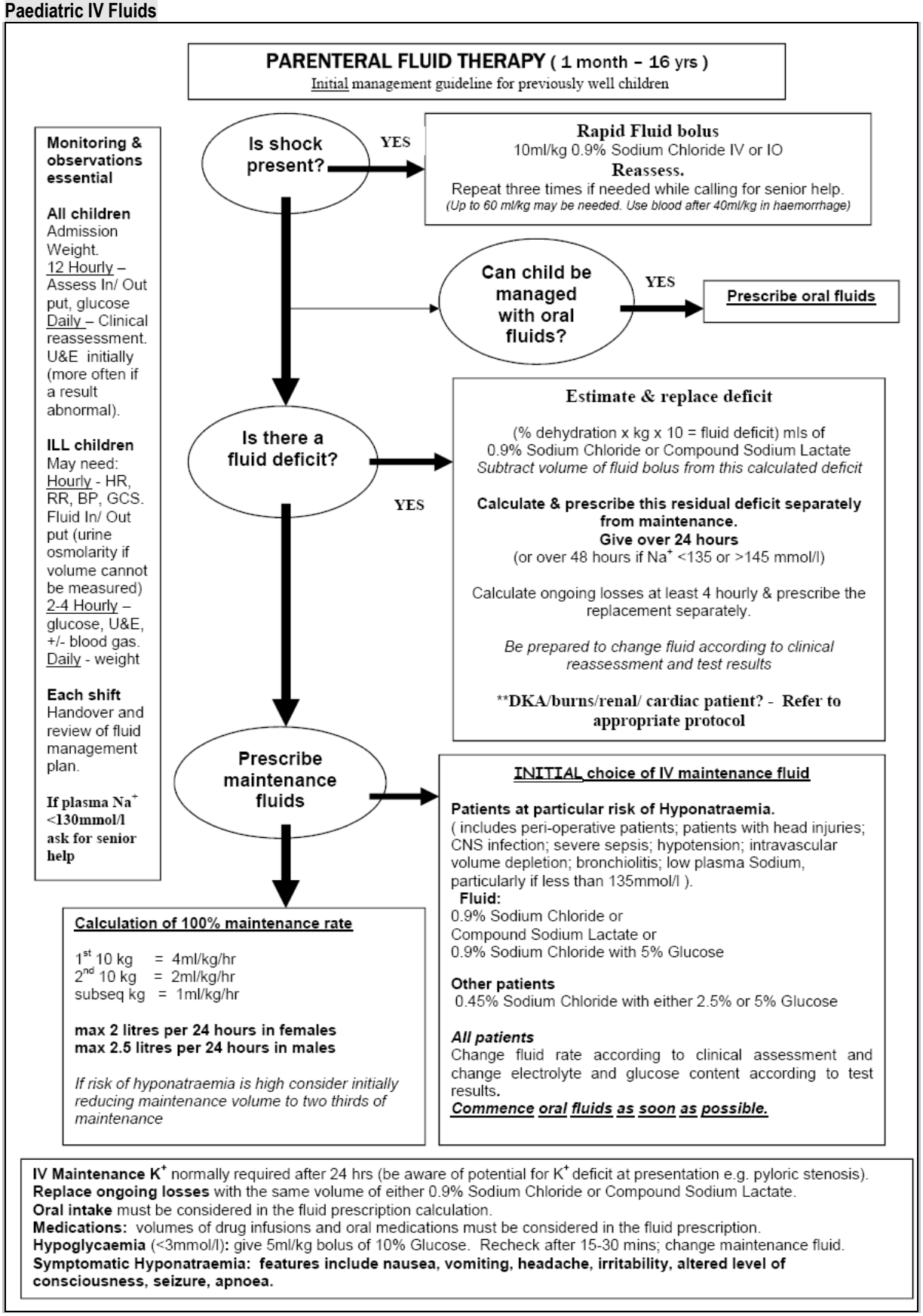
**Advise parents:**

- **Clear fluids only – regularly and small amounts.**
- **Dioralyte.**

- **Advance to simple foods.**
- **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

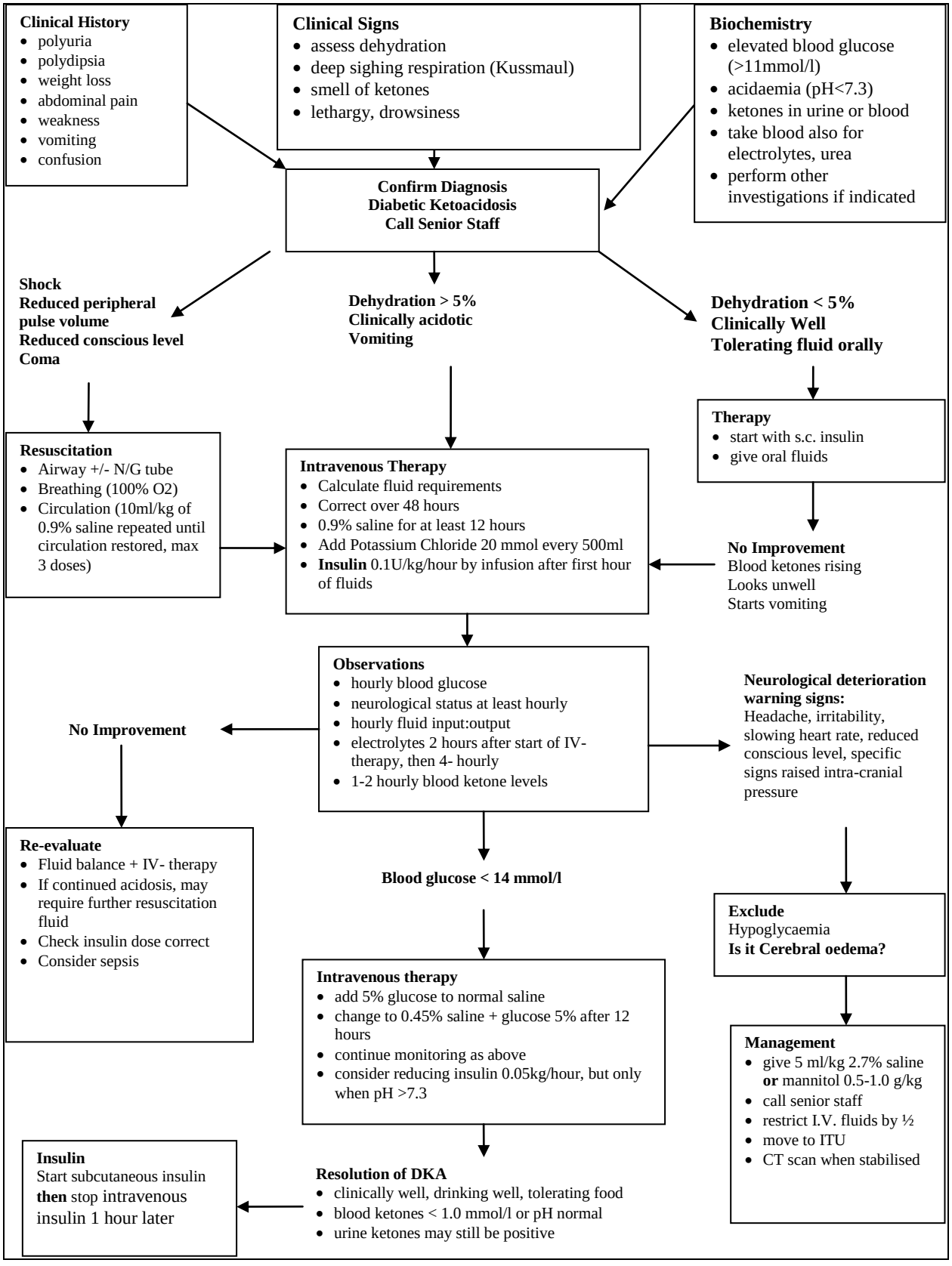
| Signs | Severity | | |
|---|---|---|---|
| | Mild | Moderate | Severe |
| General condition | Thirsty, restless, agitated | Thirsty, restless, irritable | Withdrawn, somnolent, or comatose; rapid deep breathing |
| Pulse | Normal | Rapid, weak | Rapid, weak |
| Anterior fontanelle | Normal | Sunken | 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% |


PARENTERAL FLUID THERAPY ( 1 month – 16 yrs )
Initial management guideline for previously well children
Monitoring & observations essential
All children
Admission Weight.
12 Hourly – Assess In/ Out put, glucose
Daily – Clinical reassessment.
U&E initially (more often if a result abnormal).
ILL children
May need:
Hourly - HR, RR, BP, GCS. Fluid In/ Out put (urine osmolarity if volume cannot be measured)
2-4 Hourly – glucose, U&E, +/- blood gas.
Daily - weight
Each shift
Handover and review of fluid management plan.
If plasma Na+ <130mmol/l ask for senior help
Is shock present?
YES
Rapid Fluid bolus
10ml/kg 0.9% Sodium Chloride IV or IO
Reassess.
Repeat three times if needed while calling for senior help.
(Up to 60 ml/kg may be needed. Use blood after 40ml/kg in haemorrhage)
Can child be managed with oral fluids?
YES
Prescribe oral fluids
Is there a fluid deficit?
YES
Estimate & replace deficit
(% dehydration x kg x 10 = fluid deficit) mls of 0.9% Sodium Chloride or Compound Sodium Lactate
Subtract volume of fluid bolus from this calculated deficit
Calculate & prescribe this residual deficit separately from maintenance.
Give over 24 hours
(or over 48 hours if Na+ <135 or >145 mmol/l)
Calculate ongoing losses at least 4 hourly & prescribe the replacement separately.
Be prepared to change fluid according to clinical reassessment and test results
**DKA/burns/renal/ cardiac patient? - Refer to appropriate protocol
Prescribe maintenance fluids
Calculation of 100% maintenance rate
1st 10 kg = 4ml/kg/hr
2nd 10 kg = 2ml/kg/hr
subseq kg = 1ml/kg/hr
max 2 litres per 24 hours in females
max 2.5 litres per 24 hours in males
If risk of hyponatraemia is high consider initially reducing maintenance volume to two thirds of maintenance
INITIAL choice of IV maintenance fluid
Patients at particular risk of Hyponatraemia.
( includes peri-operative patients; patients with head injuries; CNS infection; severe sepsis; hypotension; intravascular volume depletion; bronchiolitis; low plasma Sodium, particularly if less than 135mmol/l ).
Fluid:
0.9% Sodium Chloride or
Compound Sodium Lactate or
0.9% Sodium Chloride with 5% Glucose
Other patients
0.45% Sodium Chloride with either 2.5% or 5% Glucose
All patients
Change fluid rate according to clinical assessment and change electrolyte and glucose content according to test results.
Commence oral fluids as soon as possible.
IV Maintenance K+ normally required after 24 hrs (be aware of potential for K+ 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.

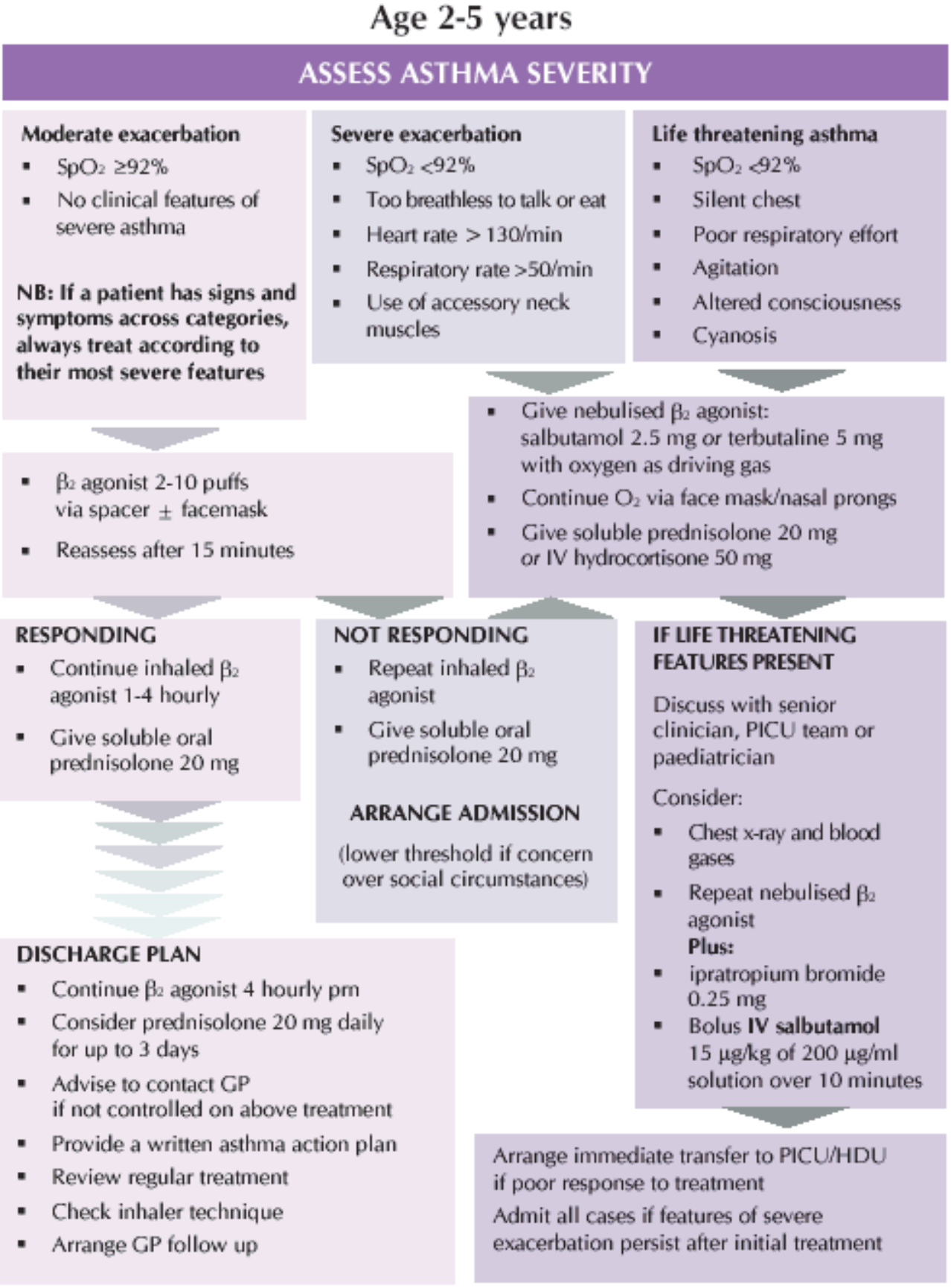
## Paediatric DKA protocol- details on Trust intranet

**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



## Paediatric Asthma



# Age >5 years

## ASSESS ASTHMA SEVERITY

**Moderate exacerbation**
- $SpO_2$ ≥92%
- PEF ≥50% best or predicted
- No clinical features of severe asthma

**NB: If a patient has signs and symptoms across categories, always treat according to their most severe features**

- $\beta_2$ agonist 2-10 puffs via spacer
- Reassess after 15 minutes

**RESPONDING**
- Continue inhaled $\beta_2$ agonist 1-4 hourly
- Add 30-40 mg soluble oral prednisolone

**DISCHARGE PLAN**
- Continue $\beta_2$ agonist 4 hourly prn
- Consider prednisolone 30-40 mg daily for up to 3 days
- Advise to contact GP if not controlled on above treatment
- Provide a written asthma action plan
- Review regular treatment
- Check inhaler technique
- Arrange GP follow up

**Severe exacerbation**
- $SpO_2$ <92%
- PEF <50% best or predicted
- Heart rate >120/min
- Respiratory rate >30/min
- Use of accessory neck muscles

**Life threatening asthma**
- $SpO_2$ <92%
- PEF <33% best or predicted
- Silent chest
- Poor respiratory effort
- Altered consciousness
- Cyanosis

- Give nebulised $\beta_2$ agonist: salbutamol 2.5 mg *or* terbutaline 5 mg with oxygen as driving gas
- Continue $O_2$ via face mask/nasal prongs
- Give soluble prednisolone 30-40 mg or IV hydrocortisone 100 mg

**NOT RESPONDING**
- Repeat inhaled $\beta_2$ agonist
- Add 30-40 mg soluble oral prednisolone

**ARRANGE ADMISSION**

(lower threshold if concern over social circumstances)

**IF LIFE THREATENING FEATURES PRESENT**

Discuss with senior clinician, PICU team or paediatrician

Consider:
- Chest x-ray and blood gases
- Bolus **IV salbutamol** 15 µg/kg of 200 µg/ml solution over 10 minutes
- Repeat nebulised $\beta_2$ agonist

**Plus:**
- ipratropium bromide 0.25 mg nebulised

Arrange immediate transfer to PICU/HDU if poor response to treatment

Admit all cases if features of severe exacerbation persist after initial treatment

# Bronchiolitis Clinical Guideline 2010

**Admission Criteria**

- Oxygen saturations persistently less than 92% in room air
- Risk of severe disease
  - * Premature birth and/or bronchopulmonary dysplasia
  - * Congenital heart disease
  - * Immune deficiency
- * Marked respiratory distress
- * Apnoeic spells
- * Need for frequent nasopharyngeal suction
- * Failed trial of feeding or feeding less than 50% normal
- * *Beware: Young infants early in course of illness (peaks day 3-4)*

**Investigations**

- CXR and blood investigations are not indicated in clinically diagnosed, uncomplicated bronchiolitis
- Nasopharyngeal secretions for RSV status can help cohort patients and may decrease the use of antibiotics

**Discharge**

- Feeding ideally 75% normal
- Some symptoms will persist for 2 weeks (40%) and in some cases 4 weeks (10%) after onset
- Illness peaks at day 3-4, so symptoms may worsen before improving and child may need to be reassessed
- In the recovery phase, some infants may be clinically well but have oxygen saturations of 90 – 94%, and may be considered for discharge.

**Management**

**Supportive therapy**

- Keep O2 saturations above 92% in the acute phase
- Suction of nasopharyngeal secretions

**Fluid management**

- Trial of oral or nasogastric feeds using small frequent boluses
  - Mild to moderate cases
  - Consider aspiration risk; may need to restrict to 2/3 maintenance
- IV fluids
  - More severe cases
  - Failed trial of enteral feeding
  - Imminent intubation
  - Restrict 2/3 maintenance and follow fluid management guidance

**Nebulised Therapy**

**Hypertonic Saline (Severity score > 6)**

**4ml 3% Saline given 8-hourly**

**Adrenaline (Severity score > 8)**

*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.***

Adrenaline can be added to doses of hypertonic saline

**1.5 ml Adrenaline 1/1000 added to 4 ml hypertonic saline (8-hourly)**

Additional doses of nebulised adrenaline may be given where necessary

**1.5 ml Adrenaline 1/1000 mixed 1:1 with 0.9% Saline**

| 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%<br>Nasal prongs 100% O2: < 2L | 29-35%<br>Nasal prongs 100% O2: (2 – 4 L) | >35%<br>Nasal prongs: >4L |

## Major Trauma – Children (see ABC Seriously Ill Child)

***Dial 6666. Follow the trauma and paediatric triage protocols. You Can Follow The Sequence for 'Seriously Ill Child' With Modifications Below:***

**Protect the neck with 'Stiffneck' collar and the 'Head-hugger'**

**Go through the 'ABC' sequence**

**Mini-neurological assessment; AVPU, pupils, posture**

**Logroll – examine C-Spine and remove spinal board**

**Get an accurate history of the accident**

**Request x-ray cervical spine, chest, pelvis**

**Keep reassessing 'ABC'**

**Do a secondary survey - Head**

**(Neck)**
**Chest**
**Abdomen**
**Pelvis**
**Limbs**
**Reflexes**

- **Normal Saline or blood administration in 20ml/kg pushes**
- **Do not catheterise bladder unless unconscious but ng tube is indicated for signs of shock.**
- **Diagnostic peritoneal lavage is <u>not</u> indicated - CT for children!**
- **Adequate analgesia is e*ssential.* Analgesia - iv aliquots of Morphine 0.1mg/kg diluted up to total volume of 10mls with water. Titrate against effect.**
- **A rectal examination is rarely indicated and should only be performed by an experienced surgeon.**
- **Calculating weight: use the formula "weight (in kgs) = (age + 4) x 2"**

**Sometimes it is more practical to allow disturbed young children to sit on a parent's knee with somebody immobilising the spine from behind.**

# 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 Emergency Department 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**

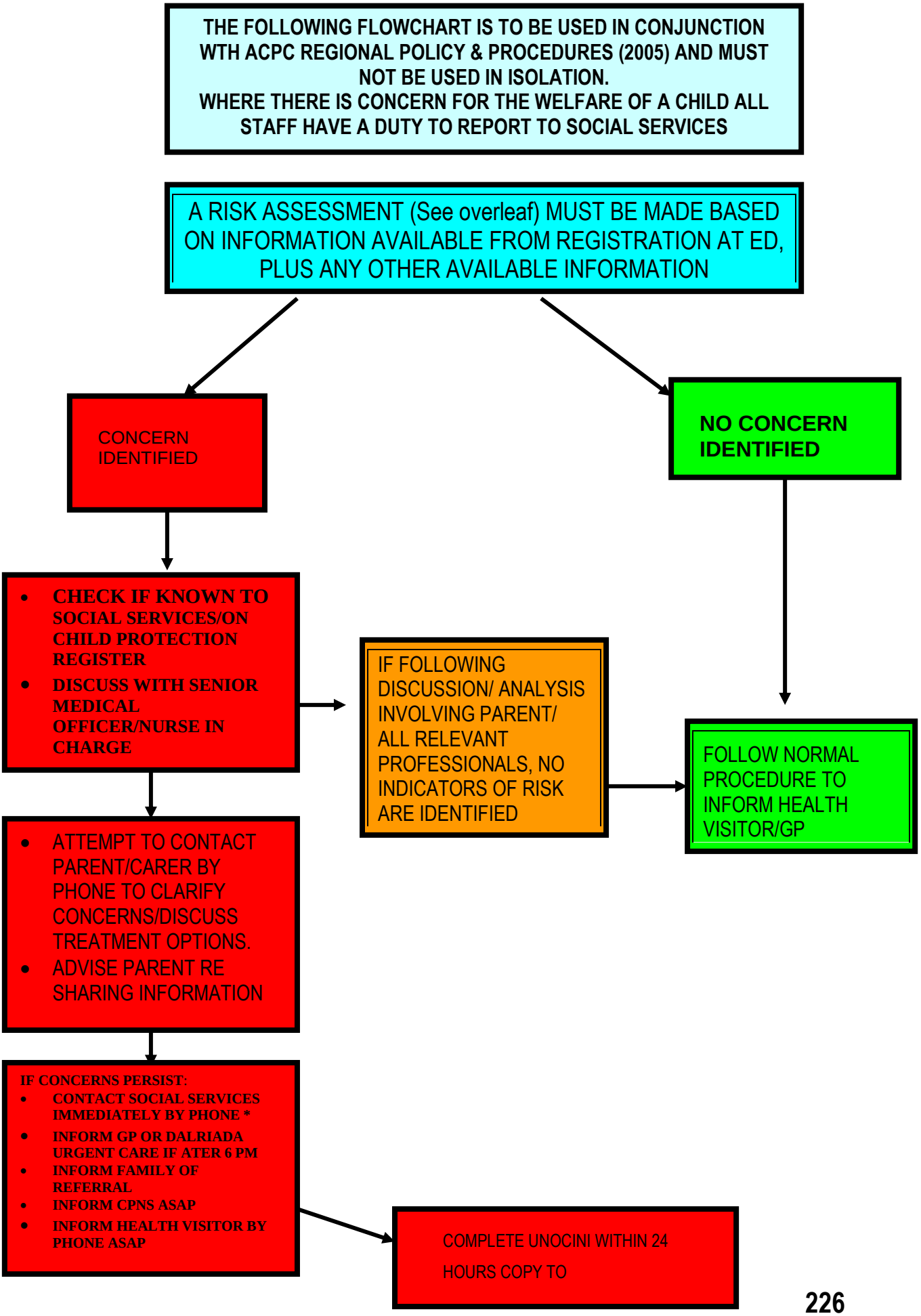
***Don't forget that there is often an innocent explanation for suspicious situations and diseases (e.g. bleeding disorders) can mimic NAI.**

**<u>METICULOUS NOTE KEEPING IS MANDATORY</u> – 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 by child or other member of family**
- **Underage pregnancy**
- **Genital injury**
- **Sexually transmitted disease**
- **Precocious sexual behaviour**
- **Deliberate self harm/behaviour problems**

# GUIDELINE for EMERGENCY DEPARTMENT (ED) STAFF WHEN A CHILD LEAVES WITHOUT BEING ASSESSED/TREATED



## The Limping Child

**Always take this symptom seriously. All children require careful examination including comparison of the various joints, systemic temperature, ENT, Chest & abdomen, x-ray (usually ap and frogs legs hips if >8yrs old), white cell count and ESR/CRP. Any discharges should be asked to return within 24 hours if no improvement.**

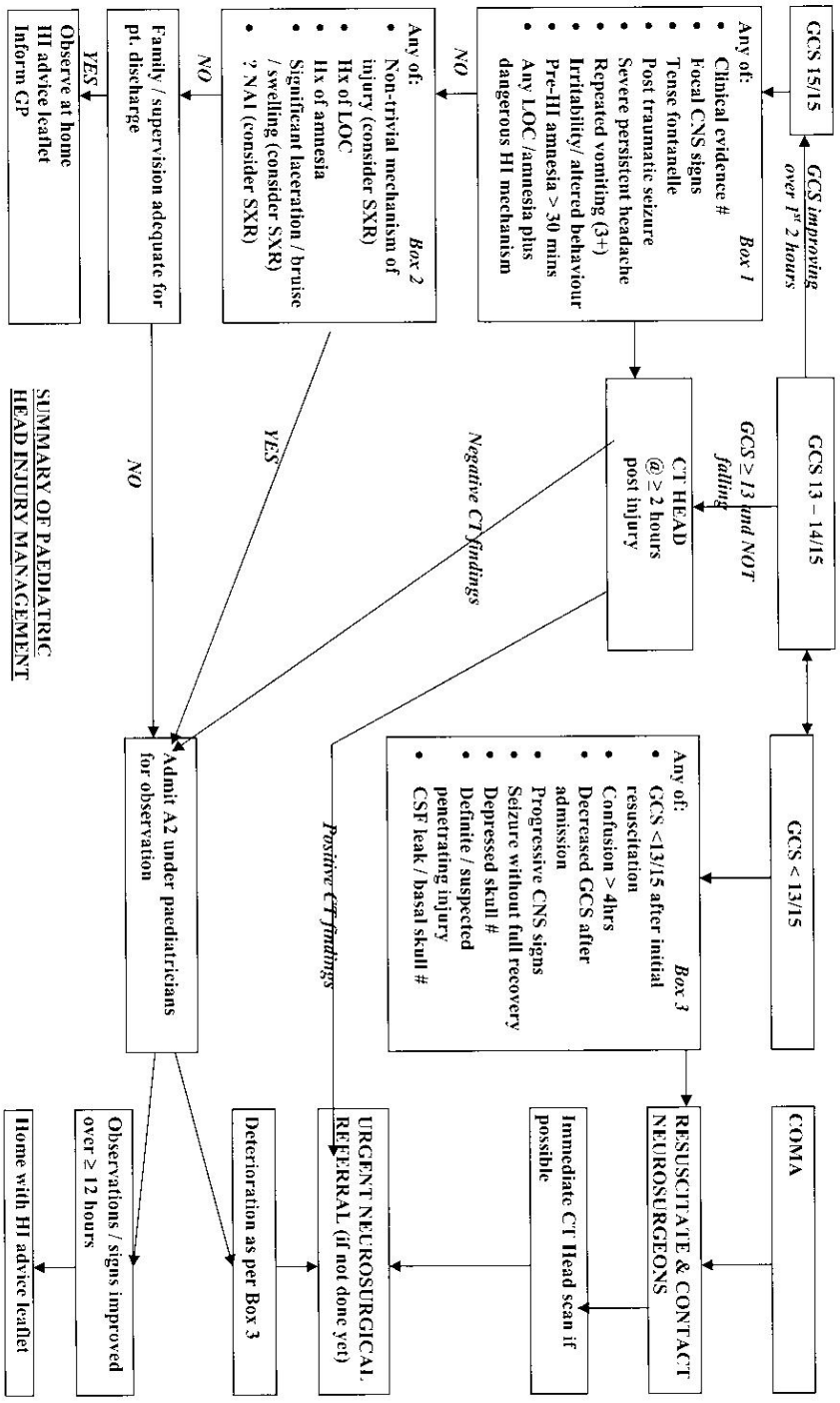
**Don't miss:-**
**septic arthritis (any age group but may not be obvious in babies)**
**unsuspected hip fracture (don't forget NAI)**
**Perthe's disease (Primary school age – x-ray abnormality)**
**Slipped upper femoral epiphysis (Secondary school age – x-ray abnormality and restricted internal rotation) Needs AP and Frogs legs view. REFER URGENTLY**
**Fractured distal femur / ankle/ tibia/toes!: compare both legs for swelling from hip to toe & ask parents to look too**

**The commonest cause is a sprain or an "irritable hip" related to a viral illness but all pyrexic children with a limp, a raised CRP and hip muscle spasm must be scanned at Antrim and/or referred to RBHSC urgently. All limping children should come back to the Emergency Department *next day if not improving.***

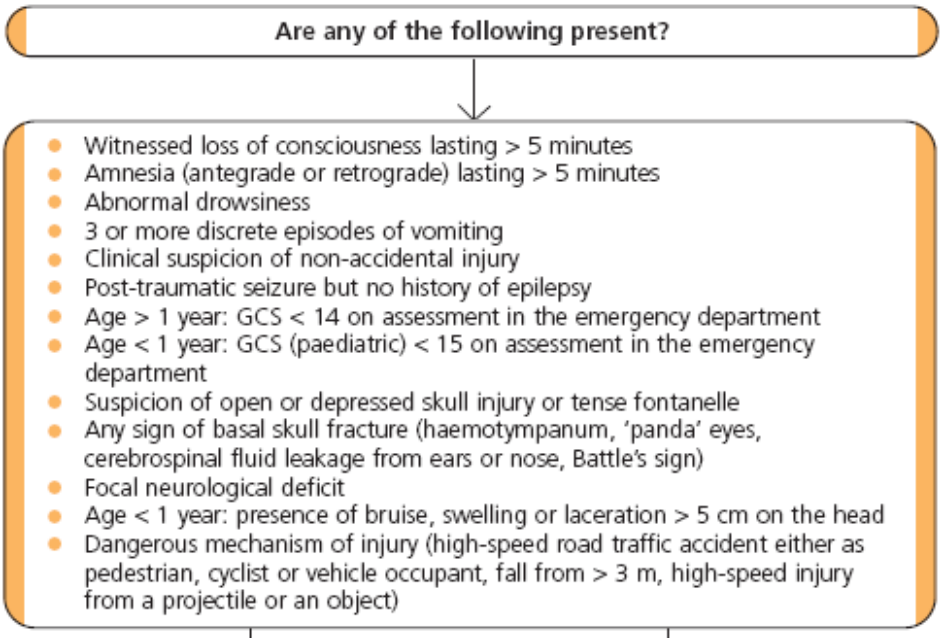
**Joint effusion +/- sepsis**

- **Limp**
- **Fever**
- **Raised WCC or CRP**
- **Hip muscle spasm**

**A common mistake is to miss a tibial or ankle/foot fracture in a toddler. Examine the whole limb and x-ray as required. Tibial fractures in toddlers may be invisible for 10 days – SLPOP and review at the clinic on day 10 if you find localised tibial tenderness in a limping child.**


GCS 15/15
GCS improving over 1st 2 hours
Any of:
Clinical evidence #
Focal CNS signs
Tense fontanelle
Post traumatic seizure
Severe persistent headache
Repeated vomiting (3+)
Irritability/ altered behaviour
Pre-HI amnesia > 30 mins
Any LOC /amnesia plus dangerous HI mechanism
Box 1
NO
Any of:
Non-trivial mechanism of injury (consider SXR)
Hx of LOC
Hx of amnesia
Significant laceration / bruise / swelling (consider SXR)
? NAI (consider SXR)
Box 2
NO
Family / supervision adequate for pt. discharge
YES
Observe at home
HI advice leaflet
Inform GP
SUMMARY OF PAEDIATRIC HEAD INJURY MANAGEMENT
GCS 13 – 14/15
GCS ≥ 13 and NOT falling
CT HEAD @ ≥ 2 hours post injury
Negative CT findings
YES
NO
Admit A2 under paediatricians for observation
Deterioration as per Box 3
Observations / signs improved over ≥ 12 hours
Home with HI advice leaflet
GCS < 13/15
Any of:
GCS <13/15 after initial resuscitation
Confusion > 4hrs
Decreased GCS after admission
Progressive CNS signs
Seizure without full recovery
Depressed skull #
Definite / suspected penetrating injury
CSF leak / basal skull #
Box 3
Positive CT findings
URGENT NEUROSURGICAL REFERRAL (if not done yet)
Immediate CT Head scan if possible
RESUSCITATE & CONTACT NEUROSURGEONS
COMA

**At present there is discussion around head injuries and the adoption of the NICE guidelines in relation to head injuries in UNDER 16s. To date the local protocols will be used, however the following signs, symptoms, kinematics and history should be considered.**
**If any of the below are present then such cases should be discussed with a middle-grade or consultant.**




**In some cases the child will require sedation of some description prior to CT scan. These patients must be discussed with the consultant.**

**Paediatric bony injuries tend to be different from adults due to the weakness of a childs bone (the ligaments are far stronger than bone) and the presence of growth plates.**
**The epiphyseal plates means 2 things:**
**1. x-rays are harder to look at (especially elbows)**
**2.fractures tend to occur around these areas.**

**<u>Elbow injuries.</u>**
**These are very common in children.**

- **child with a sore elbow following a fall**
- **x-ray looks normal but cannot straighten out**

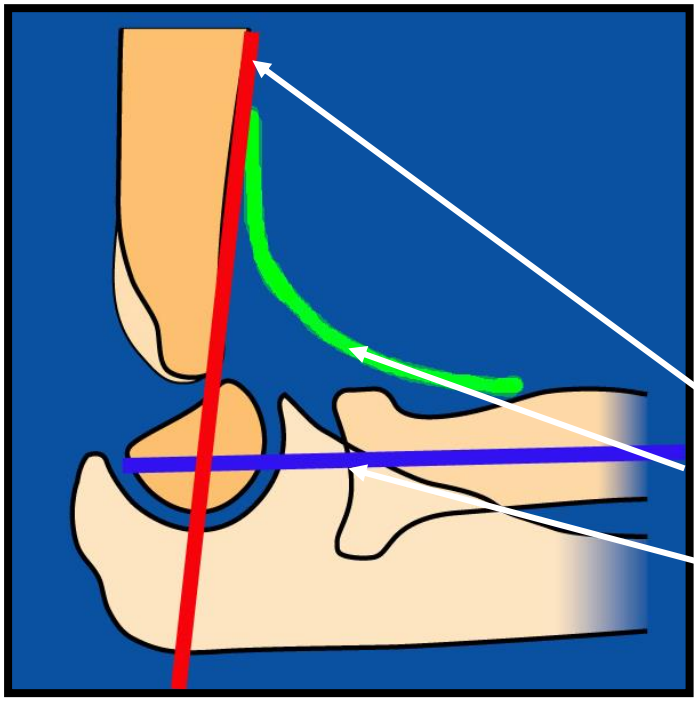
- **IT'S BROKE**

**Familiarise yourself with a normal lateral x-ray of the elbow.**

- **Anterior humeral line: important for supracondylar fractures**
  - **drawn tangential to the 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)**

- **Radiocapitellar 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 looks like the coronoid line**
  - **Fat pad displacement is a response to distention of the joint capsule**



Normal elbow demonstrating radiographic lines:

**anterior humeral line,**

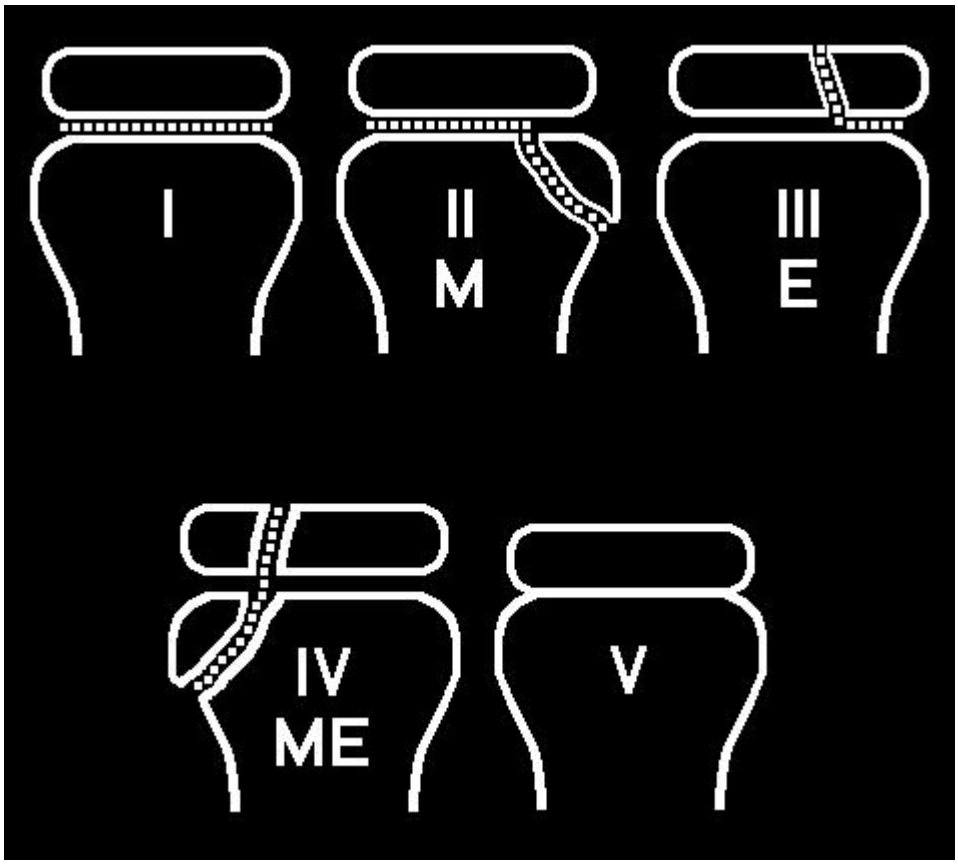
**coronoid line,**

**radiocapitellar line.**

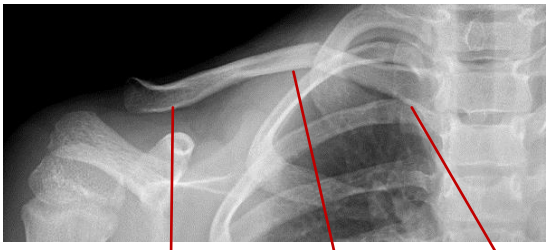
**Salter Harris Fractures**
**These ar very common fractures in children.**
**They tend to be missed in the fingers and metacarpals and around ankles.**

**Type II are the most common.**
**In children with sore fingers localise the pain and request an x-ray of the 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**



# AAH ED Paediatric Clavicle Fracture Management




Clavicle Fracture

Tenting of skin?
Open fracture?
Neurovascular injury?
Medial third of clavicle (potential high impact / underlying thoracic injury – may require CT)
Pathological fracture?

Discussion with senior ED doctor in hours, or on-call orthopaedics team at time of seeing patient

Age ≤ 1yr? Or ≥ 14yrs?

Clavicle Advice Leaflet
Discharge in sling
Refer Fracture Clinic 3/52

Fracture of lateral third

Clavicle Advice Leaflet
Discharge in sling
Refer to fracture clinic 3/52

Fracture of middle third

Greenstick or bone fragments still touching i.e. not off-ended

Clavicle Advice Leaflet a
Discharge in sling
No routine follow up

Displaced

Clavicle Advice Leaflet
Discharge in sling and refer fracture clinic 3/52

## Zip Entrapment in Children (ZEP)

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 oramorph for the pain (not with midazolam!).*

Alternatively, oral midazolam then a local anaesthetic injection into the entrapment site or penile block. Then remove the zip.

**Infant paracetamol suspension (120 mg/5ml)**

| OLD | | | NEW | | |
|---|---|---|---|---|---|
| AGE | DOSE | How often (in 24 hours) | AGE | DOSE | How often (in 24 hours) |
| 3 months to under 1 year | 2.5 ml | 4 times | 3 – 6 months | 2.5 ml | 4 times |
| 1 year to under 6 years | 5 to 10 ml | 4 times | 6 – 24 months | 5 mL | 4 times |
| | | | 2 – 4 years | 7.5 ml | 4 times |
| | | | 4 – 6 years | 10 ml | 4 times |

**Paracetamol six plus suspension (240/250 mg/5ml)**

| OLD | | | NEW | | |
|---|---|---|---|---|---|
| AGE | DOSE | How often (in 24 hours) | AGE | DOSE | How often (in 24 hours) |
| 6 – 12 years | 5 to 10 mL | 4 times | 6 – 8 years | 5 ml | 4 times |
| | | | 8 – 10 years | 7.5 ml | 4 times |
| | | | 10 – 12 years | 10 ml | 4 times |

**Ibuprofen syrup 10mg/kg (100mg/5mls)**

| | | |
|---|---|---|
| **Child aged** | **6-12 months** | **2.5mls (50mg)** |
| | **1-3 years** | **5mls (100mg)** |
| | **4-6 years** | **7.5mls (150mg)** |
| | **7-9 years** | **10mls (200mg)** |
| | **10-12 years** | **15mls (300mg)** |

**Moderate pain**

**Oramorph should be used in triage for children with moderate pain, e.g. closed forearm fractures without much deformity, burns, etc.**
**Oramorph which is a soluble form of morphine can be given to a child in a dose of 0.4mg.kg. The solution strength is 10mg in a 5ml vial.**

| | |
|---|---|
| **Child aged less than 1** | **Don't give** |
| **1-2** | **2mls** |
| **2-3** | **2.5mls** |
| **3-4** | **3mls** |
| **4-6** | **3.5mls** |
| **6-8** | **4mls** |
| **9-12** | **5mls** |

**Severe pain**
**CHILDREN IN SEVERE PAIN REQUIRE INTRAVENOUS OPIATE IMMEDIATELY**

**The dose is 0.1mg/kg.**
**Take 10mg ampoule of Morphine and dilute with 9mls of sterile water giving a total volume of 10mls (1mg/kg solution).Estimate childs weight : wt in kg=(Age x 2) +8. Give injection over 2 minutes monitoring its effect.**

## 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 (N2O/O2 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 | Iml per year of life |
| 5-12 | 5mls |
| >12 | 10mls |

**SEE NEXT PAGE FOR INTRA NASAL DIAMORPHINE SCHEDULE**

## INTRA NASAL DISMORPHINE

## DOSAGE SCHEDULE

| 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 |

**ADD THE APPROPRIATE AMOUNT OF MLS TO 5MG OF DIAMORPHINE**
**ALWAYS GIVE 0.2ML OF THE SOLUTION**

## *Sedation for children MUST TELL SENIOR DOCTOR*

**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.**

**Midazolam syrup is an oral form of Midazolam which has been made up in strength of 1mg/ml (note that this is a different concentration from the IV Midazolam preparations). The dose of Midazolam for anxiolysis without excessive sedation is 0.5mls/kg.**

**MIDAZOLAM SYRUP MUST NOT BE USED IN COMBINATION WITH ORAL OR INTRAVENOUS OPIATE ANALGESIA UNDER ANY CIRCUMSTANCES.**

| | |
|---|---|
| Child aged less than 1 | Don't give |
| 1 – 2 | 5mls |
| 2 – 3 | 6mls |
| 3 – 4 | 7.5mls |
| 4 – 5 | 8mls |
| 5 – 6 | 9mls |
| 6 – 12 | 10mls |

**Midazolam works in 15-20 minutes and the procedure should be undertaken as soon as its effect is apparent. It makes the child appear mildly "drunk" and detached but it isn't particularly sedating in the dose above. It can be used prior to doing a procedure under local, eg, stapling/suturing or changing dressings. Some children will develop paradoxical excitation rather than sedation and parents should be warned of this possibility in advance. If this happens the child will need careful nursing until the effect wears off as the combination of hyperactivity and ataxia leads to the risk of injury.**

**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 Sa02 by an experienced nurse. Give 02 100% and stimulate child if sedation deepens after procedure.***

## *Policy Update notes*

**Policy updates will be circulated regularly to all medical staff. You are asked keep a record of them in this summary table below. The updates will be kept in a file in the Computer room and further copies can also be obtained from one of the Consultant Secretaries.**

| Date | Subject | Notes |
|---|---|---|
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