



# MAJOR TRAUMA INFORMATION PACK







## FOREWORD

Dear ambulance clinician,

Report after report over the last two decades have identified the need to improve major trauma care in the UK. Over this time, major trauma networks around the globe and military conflicts have considerably strengthened the evidence base. Technology has also improved to assist the pre-hospital management of major trauma patients, particularly haemostatic agents, ways to gain intra-osseous access and pelvic stabilisation.

From 2 April 2012, with your help, we will actually make a difference. Taking more patients directly to the best hospital for them will mean times to life saving specialist surgery will be dramatically reduced. You should equally notice a difference in every hospital's readiness for your arrival with a major trauma patient.

Please read this booklet and share your ideas on how we can continue to improve the network. If you don't think it is working as well as it should, or your hospital reception is not what you expect, then please report this through your GWAS systems or directly to me.

We have a great opportunity to give consistent high quality care to people suffering major trauma, wherever that occurs.

Yours sincerely

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## **Introduction**

Trauma remains the fourth leading cause of death in western countries and the leading cause of death in the younger population (<45 years old).

In England, the National Audit Office (NAO, 2010) estimated that there are at least 20,000 cases of major trauma each year in England resulting in 5,400 deaths and many others resulting in permanent disabilities requiring long term care. Major trauma is therefore, not only a leading cause of death but also a large socio-economic burden: It is estimated that major trauma costs the NHS between £0.3-0.4 billion a year in immediate treatment and the estimated annual lost economic output as a result of major trauma is estimated to be between £3.3 billion and £3.7 billion.

## **What is major trauma?**

Major trauma is trauma that may cause death or severe disability and generally includes such injuries as: amputation, severe knife and gunshot wounds, major head injuries, multiple injuries and spinal injuries.

For the purpose of trauma systems, major trauma is defined as those patients with an injury severity score (ISS) of more than 15. However, the ISS is calculated retrospectively after all of the patient's injuries have been identified and catalogued and it is not applicable to the pre-hospital setting.

For the purpose of this document, major trauma patients are defined as those patients who fulfil one or more of the physiological and/or anatomical criteria in the pre-hospital major trauma triage tool (see appendix A).

## **Case for change**

In 2007, the National Confidential Enquiry into Patient Outcome and Death (NCEPOD) published the "*Trauma: Who Cares?*" report. It suggested that almost 60% of patients who suffered from major trauma received a standard of care that was less than good practice. This was related to the lack of appreciation of the severity of the illness, incorrect clinical-decision making and a lack of experienced staff at certain times in some hospitals. This report confirmed the findings of the report from the Royal College of Surgeons of England (2006) that high quality trauma care is not



consistently available within the NHS and that major trauma is only accounts for less than 0.2% of the total emergency department activities for a district general hospital.

Most major trauma patients are attended by ambulance clinicians and taken from scene to the nearest local hospital. Two thirds of these major trauma patients require transfer after initial treatment as their local hospital was unable to provide the specialist care needed for their often multiple and complex injuries.

Internationally, the establishment of trauma systems has been founded on trauma centres. These centres are hospitals which are designated and specialise in the treatment of the severely injured. Hence they see such patients with sufficient frequency to gain expertise in their management. The study of the Quebec trauma system has shown mortality dropped from 52% to 19% due to transport directly from scene to these centres and the receipt of specialist treatment (Sampalis et. al., 1999). As a result, the NHS is now committed to reforming trauma care services and health regions are developing change programmes to introduce regional Trauma Networks across England, a policy endorsed by the NAO (2010). It is anticipated that regional Trauma Networks will be in place across the country by the April 2012.

### **The priorities in trauma care**

The overall goal of a regional trauma network/system is to reduce death and disability following major trauma. The priorities are:

- Identifying major trauma patients at the scene of the incident who are at risk of death or disability
- Immediate interventions to allow safe transport
- Rapid dispatch to major trauma centres for surgical management and critical care
- Coordinated specialist reconstructive surgery
- Targeted rehabilitation and repatriation

(The intercollegiate Group on Trauma Standards, 2009)

### **Regional trauma network**

A regional trauma network serves a defined area and aims to reduce death and disability to that population following injury. It delivers optimal trauma care to a population following a public health model. The trauma network includes ambulance



services, all trauma receiving hospitals, major trauma centres, rehabilitation services, research, education and network governance.

The trauma network optimises the use of resources, so a trauma patient is treated in the right place at the right time by the right specialists. Major trauma patients are treated in a major trauma centre (MTC), while other trauma patients are treated at trauma units (TU). Both MTCs and TUs have completed a designated process to ensure they meet the intercollegiate group on trauma standards.

There are three regional trauma networks within the GWAS area: the Severn, Thames Valley and Wessex Trauma networks.

The Severn trauma network covers the majority of the GWAS area (with exception of the east of Cotswolds, Swindon area and south of Wiltshire). The dedicated major trauma centre for the network is Frenchay Hospital in Bristol. The MTC will be moving to the Southmead Hospital site when the new hospital opens in 2014.

The Thames Valley Trauma network covers the east of Cotswolds in Gloucestershire and Swindon area of GWAS. It also covers the north section of the South Central Ambulance Service (SCAS) area (such as Berkshire, Oxfordshire and Bedfordshire). Its dedicated major trauma centre is the John Radcliffe Hospital in Oxford.

The Wessex trauma network covers the south of Wiltshire within GWAS. It also covers both SCAS (Hampshire) and South Western Ambulance Service (SWAST), Dorset area. Its dedicated major trauma centre is University Hospital Southampton.



### **The role of the ambulance service in the Trauma Network**

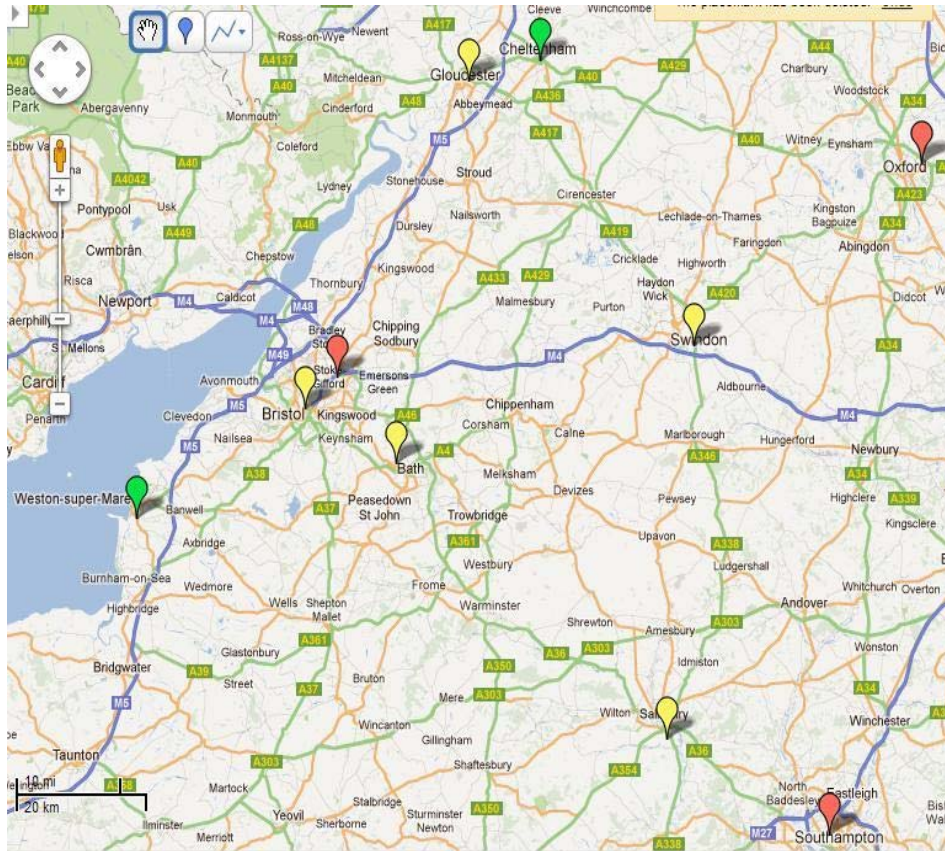
The ambulance service plays an important role as it is often the entry point for the regional trauma network and is often the entry point for the regional Trauma Network and it contributes significantly to the first three priorities of a regional Trauma Network:

- Identifying major trauma patients at the scene of the incident who are at risk of death or disability by applying the pre-hospital major trauma triage tool.
- Providing immediate interventions to allow safe transport by improving patient care provided by ambulance clinicians at scene.
- Support the rapid dispatch to major trauma centres for surgical management and critical care in both primary bypass and secondary transfer.

The ambulance service is an integrated part of the regional trauma network governance structure. Trust representatives are involved in both the local trauma unit clinical governance meetings and the network-wide mortality and morbidity meetings. This ensures the exchange of constructive feedback between the ambulance services, trauma units and major trauma centres to improve the service provision to major trauma patients.



Fig 1. Hospitals within the GWAS area



Major Trauma Centre	Postcode
Frenchay Hospital, Bristol	BS16 1LE
John Radcliffe hospital, Oxford	OX3 9DU
University Southampton Hospital, Southampton	SO16 6YD
Trauma Unit	
Bristol Royal Infirmary, Bristol	BS2 8HW
Gloucester Royal Hospital, Gloucester	GL1 3NN
Great Western Hospital, Swindon	SN3 6BB
Royal United Hospital, Bath	BA1 3NG
Salisbury District Hospital, Salisbury	SP2 8BJ
Emergency Department	
Cheltenham General Hospital, Cheltenham	GL53 7AN
Weston General Hospital, Weston-Super-Mare	BS23 4TQ



### **What is a major trauma centre?**

The NHS Clinical Advisory Group (CAG) on trauma has defined major trauma centre (MTC) as a multi-specialty hospital on a single site, optimised for the provision of trauma care (NHS, 2010). It is the centre of the trauma network and manages all types of injuries, providing consultant-level care in all the major specialist services relevant to the care of major trauma (i.e. general, emergency medicine, vascular, orthopaedic, plastic, spinal, maxillofacial and cardiothoracic surgery, neurosurgery and intervention radiology). The MTC is optimised for the definitive care of injured patients and takes responsibility for the care of all patients with major trauma in the geographical area covered by its regional trauma network.

In addition, the MTC will also manage a certain proportion of trauma patients who have not suffered major trauma. These patients come from their local catchment area and from over-triage of trauma patients to the centre.

The intercollegiate group has mandated the national standards for major trauma centres (2009), which include a:

- Consultant-led trauma team
- Consultant trauma team leader resident on-site 24/7 and immediately available
- Resident senior clinicians (minimum of registrar grade (ST4 and above)) available at all times in general surgery, orthopaedics, neurosurgery and anaesthetics as part of the multi-disciplinary trauma team
- On call consultants from all relevant other specialities (including spinal surgery, plastic surgery, vascular surgery, cardiothoracic surgery, interventional radiology) as required who will attend within 30 minutes
- FAST ultrasound scan and plain x-ray film immediately available.
- Full body CT and MRI scanning available at all times.

### **What is a trauma unit?**

A trauma unit (TU) is a hospital in a trauma network that is responsible for the management of trauma patients who are not classified as having sustained major trauma in the local catchment area. It may also receive major trauma patients either due to under-triage errors or because patients require immediate life-saving interventions prior to continued care at a MTC. Trauma Units have systems in place to support the rapid transfer of those patients with the most severe injuries to a MTC.



The national standards for trauma units (The intercollegiate group on trauma standards, 2009) include:

- Consultant-led trauma team, where a consultant with appropriate skills is available, otherwise a team led by a suitably trained registrar (ST4 or above) with a consultant attending within 30 minutes as required.
- The trauma team should be configured to manage, at any time arrival of patients from the following three groups:
  - Those considered having injuries not requiring expertise of the MTC.
  - Those critically injured for whom transfer to the MTC could adversely affect outcome.
  - Those who are not critically unstable but who would benefit from specialist care.
- Whole body CT scan available at any time.

#### **What is the local emergency hospital (LEH)?**

The local emergency hospital is a hospital in a Trauma Network that does not routinely receive acute trauma patients but has an emergency department. It has processes in place to ensure that should acute trauma patients are appropriately transferred to an MTC or TU. There is no set standard for the local emergency hospital and it does not require going through the same designation process as MTC/ TU.



### **The major trauma triage tool**

GWAS has been working closely with the Wessex Trauma Network, SCAS and SWAST to produce the Wessex trauma unit bypass tool. However, GWAS has produced a separate tool (see appendix 1) which is a modification of the original Wessex trauma unit bypass tool to accommodate some local variations across all three regional trauma networks within the GWAS area.

### **Anatomical and physiological criteria**

The first part of the triage tool is a list of physiological and anatomical criteria for identifying major trauma in pre-hospital settings. These criteria are modified from the American College of Surgeons (2006) *Guidelines for Field Triage*.

Respiratory rate: The word “sustained” was added to respiratory rate criteria in the Wessex tool. Its aim is to reduce the over-triage rate as it is common for trauma patients to have an initial raised respiratory rate for various reasons (such as anxiety, stress, pain etc.) which are not a true pathophysiological response to major trauma.

Glasgow coma scale (GCS): The original ACS guideline uses the overall GCS <14 as one of the physiological criteria for major trauma. However, based on the experience from the London Trauma office (2011), GCS is one of the most common physiological criteria which triggers over-triage patients to major trauma centres in London. Hence the Wessex Trauma Network decided to change the GCS criteria to “GCS motor score 4 or less” as the GCS motor score is a more specific indicator for the severity in major trauma patients.

Anatomy criteria: The wording had been modified in the Wessex trauma unit bypass tool following the *Major Trauma Audit* by South Western Ambulance Service NHS foundation trust (2011). Feedback from staff involved in the *Major Trauma Audit* suggested that the wording in the original ACS guideline are confusing and depends on subjective interpretations. Furthermore, the penetrating trauma and major burns criteria were removed from the Wessex tool due to the geographical area of South West England and variation in capabilities of trauma units.

Following the use of both physiological and anatomical criteria, trauma patients would be triaged as major trauma patients (ie triggered one of more of the anatomy or physiological criteria) or non-major trauma patients. Non-major trauma patients should be transported to



the local emergency hospital as per normal unless ambulance clinicians believe that patients would be benefit from expertise from another specialist centre.

### **Airway and catastrophic haemorrhage**

Major trauma patients identified by the anatomy and physiology criteria would move to the next step of the triage tool. It is simply to confirm whether airway and catastrophic haemorrhage could be safely managed by ambulance clinicians on route.

If ambulance clinicians are not able to manage the patient's airway and/or catastrophic haemorrhage safely, the patient should be transported to the nearest trauma unit to be stabilised before transfer to the definitive care facilities (ie MTC).

All trauma units are capable of providing immediate airway measures (such as rapid sequence Induction) and damage control surgery to control catastrophic haemorrhage.

Due to the limited resources/ expertise available in the non-trauma unit designated emergency department, only in extreme circumstances (i.e. cardiac arrest imminent) should major trauma patients be transported to a non-trauma unit designated emergency department.

### **45 minutes drive time**

The next step on the major trauma triage tool is to determine whether the MTC can be safely reached within 45 minutes. The 45 minutes rule is applied purely on travel time and does not include time spent on scene (such as during an entrapment RTC).

Use of the air support unit (ASU) should be considered if a 45 minutes travel time by road is not achievable or if the patient could reach the MTC significantly quicker by air than by road (i.e. due to peak hour traffic, road closures etc.).

The 45 minutes drive time rule is only a notional drive time based on the military Medical Emergency Response Team (MERT) experience in Afghanistan and the London Trauma network. Due to the difference in geographic area and types of expected injuries, this is likely to be re-evaluated within the next 6-12 months.



### Isochrones drive time map

The isochrones drive time maps show the drive time from the major trauma centres across the south of England. The drive time is shown in 15 minute intervals from the MTCs.

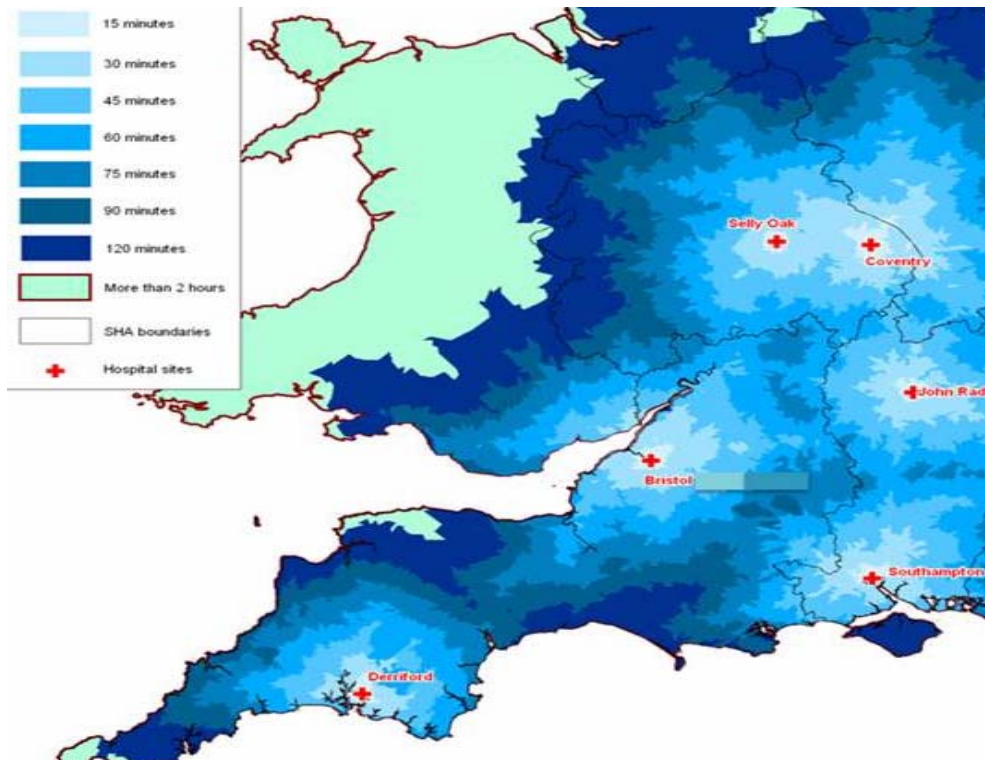


Fig. 2 Isochrones map showing the drive time from major trauma centres

### Destination

The decision on which is the most appropriate receiving hospital for a patient is dynamic and may need to be reassessed at any time, should the patient's condition change. If a patient's condition deteriorates on route to a MTC and it is no longer in their best interest to continue the journey, it may be necessary to consider diverting to another TU/ ED where travel time to the hospital is less than that to the MTC.

The GWAS major trauma triage tool is purely based on anatomical and physiological criteria. However, other factors (such as the mechanism of injury, age, presence of anticoagulation or bleeding disorders, pregnancy etc.) should be considered. Ambulance clinicians may divert some patients who may benefit from going to the major trauma centre directly.



### Documentation

A major trauma triage tool checklist (currently being finalised) must be completed for all cases where major trauma is suspected. It should be clearly indicated in the trauma tool box on the PCR (see figure 3) and stapled to the PCR for submission.

Pin	Grade	Team	Name	Signature	Pin
Pin	Grade	Team	Name	Signature	Pin
Abbey Tool	<input type="checkbox"/>	Referral	<input type="checkbox"/>	AF/TBP	<input type="checkbox"/>
ROLE	<input type="checkbox"/>	iCP	<input type="checkbox"/>		
Discharge of Care	<input type="checkbox"/>	Trauma Tool	<input type="checkbox"/>		
Drug Therapy					
Name	Code	Dose	Unit	Route / Freq	

Fig. 3 Trauma tool box in the new PCR

### The ATMIST tool

The provision of information from the scene or en route to hospital is an important tool to ensure a correct hospital response, hence handover of accurate, standardised information is essential.

The ATMIST tool (see appendix B) is recommended by the Clinical Advisory Group as the standard template for both pre-alerts to the receiving hospital and an initial short verbal hand-over to the trauma team. It has been used by several ambulance services in the UK. The feedback suggests that the tool improved the quality of information given by ambulance clinicians for both pre-alerts and handovers.

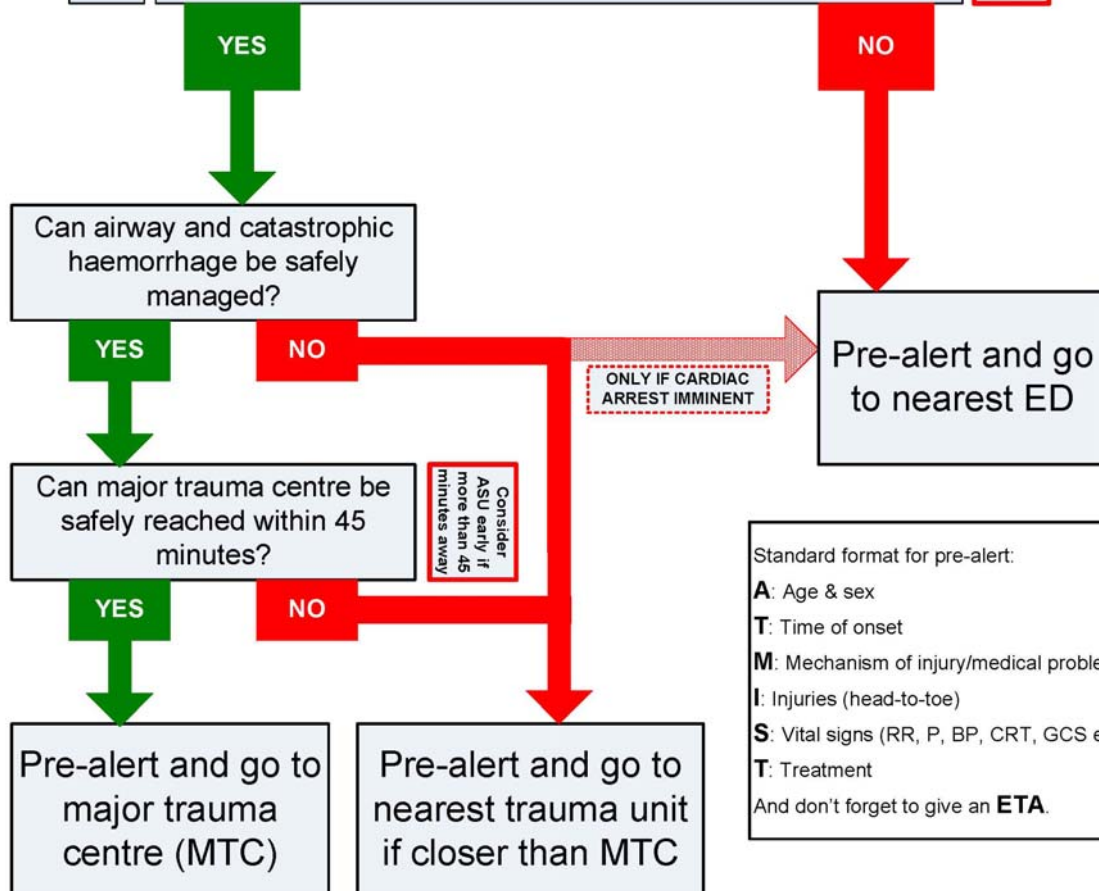


Appendix A: GWAS Major trauma triage tool

# MAJOR TRAUMA TRIAGE TOOL

Do the injuries meet any of the following criteria?

Physiology	<ul style="list-style-type: none"> <li>Sustained RR &lt;10 or &gt;29 (for abnormal paediatric values check JRCALC)</li> <li>Sustained systolic BPs &lt;90mm Hg or absent radial pulses (for abnormal paediatric values check JRCALC)</li> <li>GCS motor score of 4 or less (withdrawal to pain)</li> </ul>	<b>Consider critical care team activation</b>
Anatomy	<ul style="list-style-type: none"> <li>Open pneumothorax or flail chest</li> <li>Crushed, degloved or mangled limb</li> <li>Suspected major pelvic fracture</li> <li>Neck or back injury with paralysis</li> <li>&gt;1 fractured proximal long bone</li> <li>Amputated limb proximal to wrist or ankle</li> <li>Suspected open or depressed skull fracture</li> </ul>	



Standard format for pre-alert:

**A:** Age & sex  
**T:** Time of onset  
**M:** Mechanism of injury/medical problem  
**I:** Injuries (head-to-toe)  
**S:** Vital signs (RR, P, BP, CRT, GCS etc)  
**T:** Treatment  
 And don't forget to give an **ETA**.



Appendix B: ATMIST tool

STANDARDISED PRE-ALERT/HANDOVER TOOL: ATMIST TOOL

Age		
Time of incident/onset of symptoms		
Mechanism of injury/Medical complaint(s)	Major trauma identified by triage tool? Y/N	
Injuries/Findings (Head-to-toe)		
Vital Signs	RR: SaO2: (Air/O2.....lpm) GCS: (E: V: M: ) Temp:	P: BP: BM:
Treatment given		
ETA & call-sign		



**Appendix C: SOP for EZ-IO**

**Standard Operating Procedure (SOP) for EZ-IO Intra-Osseous Access**

**Background & Indications**

Intra-osseous access can be rapidly achieved and allows administration of drugs and fluid for resuscitation of a critically unwell patient. It is effective in both adult and paediatric patient groups. The EZ-IO® infusion systems can be used to gain vascular access easily and quickly when peripheral intravenous cannulation is not achieved or in other circumstances when repeated attempts at peripheral IV access will result in unacceptable delay in resuscitation. The use of the EZ-IO® infusion system should be considered in the following patients:

**Adult patients**

- Shock where fluid resuscitation or emergency drug administration is required (after 3 failed attempts at peripheral IV cannulation);
- Severe burns where IV cannulation may be difficult due to location of burns
- Cardiac arrest (after 3 failed attempts at peripheral IV cannulation)

**Paediatric Patients**

- Cardiac arrest -consider as first line vascular access.
- Critically unwell or shocked paediatric patients, in whom attempts at IV cannulation may be unsuccessful or result in delay of treatment

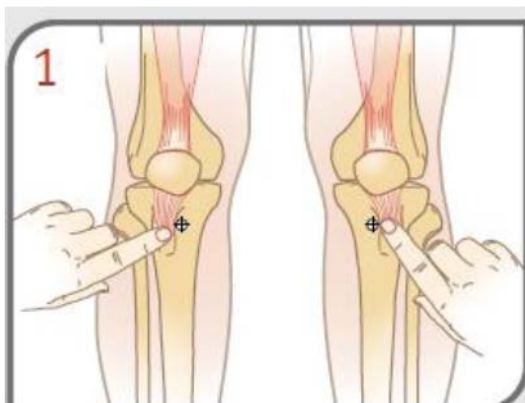
**Training:**

EZ-IO® infusion systems require specific training authorized by GWAS clinical training department prior to use.

**Needles:**

There are two standard sizes of EZ-IO® needle

- |         |        |                         |
|---------|--------|-------------------------|
| 1. 45mm | Yellow | Large patients          |
| 2. 25mm | BLUE   | Patients 40 kg and over |
| 3. 15mm | PINK   | Patients 3–39 kg        |



**Insertion site:**

**Adults/ Paediatrics:**

The site for EZ-IO® insertion is the anteromedial surface of proximal tibia, approximately 1-2 cm below the tibial tuberosity.



**CONTRAINDICATIONS:**

- Suspected fracture of the tibia selected for infusion, consider opposite side
- Excessive tissue at insertion site with the absence of anatomical landmarks
- Previous significant orthopaedic procedures (internal fixation of tibia with intramedullary nail in situ)
- Infection at the site selected for insertion
- Intra-osseous access in same limb in last 24 hours

**CONSIDERATIONS:**

**Flow rate:**

- Ensure the administration of a rapid and vigorous 10ml flush with normal saline prior to infusion. This opens up the marrow cortex and allows rapid infusion and absorption of drugs and fluids.
- **“NO FLUSH = NO FLOW”**
- Repeat syringe bolus (flush) as needed
- All JRCALC drugs and fluids that would be given by peripheral IV cannula can be administered via the EZ-IO® infusion system.

**PROCEDURE:**

*If the patient is conscious, explain procedure:*

- Apply non-sterile latex free gloves
- Cleanse site using antiseptic agent
- Allow to *air dry thoroughly*
- Connect appropriate Needle Set to driver
- Stabilise site
- Remove needle cap
- Insert correctly sized EZ-IO needle into the selected site
- **IMPORTANT:** Keep hand and fingers away from Needle Set
- Position the driver at the correct insertion site with the needle set at a 90-degree angle to the bone surface
- Gently pierce the skin with the Needle Set until the Needle Set tip touches the bone.
- Ensure visualization of at least on black line Needle Set
- Penetrate the bone cortex by gently squeezing driver's trigger and applying very gentle, consistent, steady, downward pressure (allow the driver to do the work)
- **Do not use excessive force.** In some patients insertion may take greater than 10 seconds, if the driver sounds like it is slowing down during insertion; reduce pressure on the driver to allow the RPMs of the needle tip to do the work.
- *\*In the unlikely event that the battery on the Driver fails clinicians may manually finish inserting the EZ-IO Needle Set. Grasp the Needle Set and, rotate arm, while pushing the needle into the intraosseous space. This may take several minutes.*
- Release the driver's trigger and stop the insertion process when a sudden “give or pop” is felt upon entry into the medullary space or when desired depth is obtained
- Remove EZ-IO Power Driver from Needle Set while stabilizing the catheter hub
- Remove stylet from catheter by turning counter-clockwise and immediately dispose of stylet in appropriate biohazard sharps container
- **NEVER** return used stylet or cartridge to the EZ-IO kit



- Secure site with EZ Stabiliser
- Connect primed EZ-Connect to exposed Luer-lock hub
- Confirm placement
- Aspirate marrow if possible (this can be used to check blood sugar)
- Syringe bolus: flush the catheter with 10 ml of normal saline. This is painful.
- Assess for potential IO complications, swelling at insertion site
- If the flush does not flow freely assess for complications of extravasation and do not use the EZ-IO® infusion system.
- Disconnect 10 ml syringe from EZ-Connect extension set
- Connect primed EZ-Connect extension set to primed IV tubing
- Begin infusion utilizing a pressure delivery system
- Secure tubing per institution policy
- Continue to monitor extremity for complications, check peripheral pulses
- Place EZ-IO armband on patient, document time and date
- Completed the GWAS EZ-IO audit form and return to HART

### Complications

The EZ-IO® infusion system has relatively few complications, all of which are standard to all intra-osseous access at the tibia.

#### Fracture of tibia

This is rare and usually due to excessive pressure on driver during insertion. Crepitus and swelling at insertion site will alert user to this event. The EZ-IO® infusion system should not be used if this is suspected. The needle should be left in situ and the suspected complication should be handed over to clinicians at receiving unit. An incident report will need to be made to Medical Director or ASU Medical Advisor.

#### Extravasation of infused drugs or fluids.

This can cause tissue necrosis and occasionally compartment syndrome. It is usually due to either:

- Excessive penetration, going through and through cortex. Therefore stop pressure when “give or pop” is felt. This can be recognised by swelling of the calf behind the insertion site.
- Inadequate penetration, failure to enter marrow cavity. Therefore maintain gentle pressure until “give or pop” is felt. This can be recognised by swelling at the insertion site.

If extravasation of drugs or fluids is suspected, the EZ-IO® infusion system should not be used. The needle should be left in situ and the suspected complication should be handed over to clinicians at receiving unit. An incident report will need to be made to Medical Director or ASU Medical Advisor.

#### Infection

Infection can occur at the insertion site of the EZ-IO® infusion system. This is rare and can range from superficial skin infection to osteomyelitis. This is a late complication usually only occurring after 24 hours of IO use. Therefore the time and date of insertion are important to handover to receiving clinical team. The chance of infection can be minimized by adherence to aseptic technique and not inserting through already infected or injured skin.



**Appendix D: PGD cyclizine**

**PATIENT GROUP DIRECTION (PGD)**

<b>CYCLIZINE</b>	<b>POM</b>
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**YOU MUST BE AUTHORISED BY NAME, UNDER THE CURRENT VERSION OF THIS PGD BEFORE YOU ATTEMPT TO WORK ACCORDING TO IT**

CLINICAL CONDITION	
Indication	Prevention and / or treatment of mild to moderate nausea and vomiting in adults and children over 12 years.
Inclusion criteria	<ul style="list-style-type: none"> <li>Mild to moderate nausea, vomiting, vertigo or labyrinthine disorders. When prescribed for vomiting an anti-emetic should only be prescribed when the cause is known.</li> <li>Adult or child over 12 years.</li> <li>As an alternative to metoclopramide for the prevention and treatment of nausea and vomiting following administration of an opioid.</li> </ul>
Exclusion criteria	<ul style="list-style-type: none"> <li>Allergy to cyclizine or other constituents.</li> </ul>
Cautions/Need for further advice	<ul style="list-style-type: none"> <li>Hepatic disease</li> <li>Glaucoma</li> <li>Prostatic hypertrophy</li> <li>Epilepsy</li> <li>Severe Heart Disease</li> <li>Urinary retention</li> <li>Pyloroduodenal obstruction</li> <li>May counteract haemodynamic benefits of opioids</li> </ul> <p><b>Pregnancy and lactation:</b> Vomiting in pregnancy –Cyclizine may be considered if initial treatments (e.g. dietary advice, rest) have failed and the woman has persistent, severe symptoms that prevent daily activities, or increased urine ketone levels. If the woman's symptoms are severe enough to require medication advise follow up within 24 hours to check for dehydration and response to medication.</p>
Action if patient declines or is excluded	Refer to supervising doctor. Contact trust Clinical Director or nominated deputy. Document exclusion/refusal/actions in patient care record.

**PATIENT GROUP DIRECTION (PGD)**

<b>CYCLIZINE</b>	<b>POM</b>
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DRUG DETAILS	
Name, form & strength of medicine	Cyclizine 50mg/ml
Route/Method	Intravenous: dilute up to 10ml with water for injection and to be given over 3-5 minute.
Dosage	Adults and children over 12 years <ul style="list-style-type: none"> <li>• IV 50mg</li> </ul>
Frequency	8 hourly
Duration of treatment	Single dose
Maximum or minimum treatment period	N/A
Quantity to supply/administer	50mg ampoule
Side effects	Significant: <ul style="list-style-type: none"> <li>• Drowsiness</li> </ul> Rarely: <ul style="list-style-type: none"> <li>• Hypertension</li> <li>• Convulsions</li> <li>• Blood disorders</li> <li>• Dizziness and confusion</li> <li>• Tremor/ Twitching</li> <li>• Anti-muscarinic effects:- dry mouth, blurred vision, urinary retention, constipation</li> <li>• Headache</li> <li>• Hypersensitivity reaction</li> <li>• Palpitations and arrhythmias</li> <li>• Depression</li> <li>• Sleep disturbance</li> <li>• Liver dysfunction</li> </ul>
Advice to patient/carer	<ul style="list-style-type: none"> <li>• Caution adults not to drive or operate machinery if affected by drowsiness</li> <li>• Avoid alcohol</li> <li>• If symptoms persist or worsen seek medical advice.</li> </ul>
Follow up	Follow-up by GP advised or transportation to ED

Date approved: 31/3/2012

Next review date: 01/2014

Expiry date: 1/4/2014

**PATIENT GROUP DIRECTION (PGD)**

<b>CYCLIZINE</b>	<b>POM</b>
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**STAFF CHARACTERISTICS**

<b>Professional qualifications</b>	State registered paramedic, nurse with current HPC/NMC registration
<b>Specialist competencies or qualifications</b>	<ul style="list-style-type: none"> <li>Has undertaken appropriate training to carry out clinical assessment of patient leading to diagnosis that requires treatment according to the indications listed in this PGD</li> <li>Has undertaken appropriate training for working under PGDs for the supply and administration of medicines.</li> </ul>
<b>Continuing education &amp; training</b>	The practitioner should be aware of any change to the recommendations for the medicine listed. It is the responsibility of the individual to keep up-to-date with continued professional development.

**REFERRAL ARRANGEMENTS AND AUDIT TRAIL**

<b>Referral arrangements</b>	As required
<b>Records/audit trail</b>	<ul style="list-style-type: none"> <li>Patient's name, address, date of birth and consent given</li> <li>Contact details of GP (if registered)</li> <li>Diagnosis</li> <li>Dose and form administered</li> <li>Batch and expiry date details</li> <li>Advice given to patient (including side effects)</li> <li>Signature/name of staff who administered or supplied the medication, and also, if relevant, signature/name of staff who removed/discontinued the treatment</li> <li>Details of any adverse drug reaction and actions taken including documentation in the patients medical record</li> <li>Referral arrangements (including self-care)</li> </ul>

<b>References/Resources and comments</b>	BNF 61, 2011 BNFc 61 2011-12 4.6 <a href="http://cks.library.nhs.uk/nausea_vomiting_in_pregnancy">Valoid Injection - Summary of Product Characteristics (SPC) - (eMC)</a> <a href="http://cks.library.nhs.uk/nausea_vomiting_in_pregnancy">http://cks.library.nhs.uk/nausea_vomiting_in_pregnancy</a> <a href="http://cks.library.nhs.uk/menieres_disease">http://cks.library.nhs.uk/menieres_disease</a>
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## Appendix E: PGD IV Paracetamol

## PATIENT GROUP DIRECTION (PGD)

I/V PARACETAMOL

POM

**YOU MUST BE AUTHORISED BY NAME, UNDER THE CURRENT VERSION OF THIS PGD BEFORE YOU ATTEMPT TO WORK ACCORDING TO IT**

CLINICAL CONDITION	
<b>Indication</b>	Adults and Children over 6 months with mild to moderate pain as alternative or supplement to opioid whilst transferring to an acute facility
<b>Inclusion criteria</b>	<ul style="list-style-type: none"> <li>Adults and children 6 months and over with mild to moderate pain</li> </ul>
<b>Exclusion criteria</b>	<ul style="list-style-type: none"> <li>Children under 6 months</li> <li>Known hypersensitivity to paracetamol</li> <li>Prolonged febrile convulsions (those lasting 15 minutes or longer), recurrent convulsions, or those occurring in a child at known risk must be treated more actively, as there is a possibility of resulting brain damage. Diazepam is the drug of choice.</li> </ul>
<b>Cautions/Need for further advice</b>	<ul style="list-style-type: none"> <li>Patient already taking paracetamol containing product - Do <b>not</b> give further paracetamol if a paracetamol containing product (e.g. Calpol, Co-codamol etc) has already been given within the last 4 hours or the maximum cumulative daily dose has been given already.</li> <li>Hepatic disease – increase risk of dose related toxicity – avoid maximum dosages in severe hepatic impairment.</li> <li>Caution in alcohol dependence, alcoholism and malnutrition</li> <li>Patients with severe renal impairment i.e. creatinine clearance &lt;10mL/minute, creatinine &gt;700micromols/L – avoid high dosage.</li> </ul> <p><b>Pregnancy and Lactation:</b></p> <ul style="list-style-type: none"> <li>Not known to be harmful</li> </ul>
<b>Action if patient declines or is excluded</b>	Refer to supervising doctor. Contact Trust Clinical Director or nominated deputy. Document finding and actions taken in patient care record.

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## PATIENT GROUP DIRECTION (PGD)

IV PARACETAMOL

POM

## DRUG DETAILS

## Name, form &amp; strength of medicine

Paracetamol intravenous infusion (10mg/mL) typically given over 15 minutes

## Route/Method

Intravenous: to be given over 15 minutes.

## Dosage

Adults and children over 6 months

Age	Patient weight	Dose per administration	Volume per administration	Maximum volume per administration based on upper weight limits of group mL)*	Maximum Daily Dose
0-2 years	<10k	7.5mg/kg	0.75mL/kg	7.5mL	30 mg/kg
3-10 Years	>10kg to <33kg	15mg/kg	1.5mL/kg	49.5mL	60mg/kg not exceeding 2g
11-14 Years	>33kg to <50kg	15mg/kg	1.5mL/kg	75mL	60mg/kg not exceeding 3g
15 – Adult	>50g with additional risk factors for hepatotoxicity	1g	100mL	100mL	3g
Adult	>50g with no additional risk factors for hepatotoxicity	1g	100mL	100mL	4g

## Frequency

Single dose

## Duration of treatment

Single dose

## Maximum or minimum treatment period

N/A

## Quantity to supply/administer

As per dosage

Do **not** give further paracetamol if a paracetamol containing product (e.g. Calpol, Co-codamol etc) has already been given within the last 4 hours or the maximum cumulative daily dose has been given already.

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**PATIENT GROUP DIRECTION (PGD)**

<b>IV PARACETAMOL</b>	<b>POM</b>
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<b>Side effects</b>	Side-effects rare at therapeutic doses, but rashes, blood disorders (including thrombocytopenia, leucopenia, neutropenia) reported; hypotension, flushing, and tachycardia also reported on infusion;  <b>important:</b> liver damage (and less frequently renal damage) following over dosage
<b>Advice to patient/carer</b>	<ul style="list-style-type: none"> <li>Advise on Maximum daily dose (above) and not to take other paracetamol containing products which will exceed this dose</li> <li>In the event of overdose seek immediate medical advice</li> </ul>

<b>Follow up</b>	<ul style="list-style-type: none"> <li>Record in patient care record</li> <li>Seek medical advice if pain or pyrexia worsens or if no improvement within 48 hours</li> <li>Transport to the receiving acute trust</li> </ul>
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<b>STAFF CHARACTERISTICS</b>	
<b>Professional qualifications</b>	State registered paramedic, nurse with current HPC/NMC registration
<b>Specialist competencies or qualifications</b>	<ul style="list-style-type: none"> <li>Has undertaken appropriate training to carry out clinical assessment of patient leading to diagnosis that requires treatment according to the indications listed in this PGD</li> <li>Has undertaken appropriate training for working under PGDs for the supply and administration of medicines.</li> </ul>
<b>Continuing education &amp; training</b>	The practitioner should be aware of any change to the recommendations for the medicine listed. It is the responsibility of the individual to keep up-to-date with continued professional development.

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**PATIENT GROUP DIRECTION (PGD)**

<b>IV PARACETAMOL</b>	<b>POM</b>
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**REFERRAL ARRANGEMENTS AND AUDIT TRAIL**

<b>Referral arrangements</b>	As per local arrangements/national requirements
<b>Records/audit trail</b>	<ul style="list-style-type: none"> <li>• Patient's name, address, date of birth and consent given</li> <li>• Contact details of GP (if registered)</li> <li>• Diagnosis</li> <li>• Dose and form administered</li> <li>• Batch and expiry date details</li> <li>• Advice given to patient (including side effects)</li> <li>• Signature/name of staff who administered or supplied the medication, and also, if relevant, signature/name of staff who removed/discontinued the treatment</li> <li>• Details of any adverse drug reaction and actions taken including documentation in the patients medical record</li> <li>• Referral arrangements (including self-care)</li> </ul>
<b>References/Resources and comments</b>	BNF 62, 4.7.1, BNF for children 2011-2012 4.7.1

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## Appendix E: PGD Tranexamic Acid

### PATIENT GROUP DIRECTION (PGD)

<b>Tranexamic Acid</b>	<b>POM</b>
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**YOU MUST BE AUTHORISED BY NAME, UNDER THE CURRENT VERSION OF THIS PGD BEFORE YOU ATTEMPT TO WORK ACCORDING TO IT**

CLINICAL CONDITION	
<b>Indication</b>	Treatment of major trauma related Haemorrhage within 3 hours of injury
<b>Inclusion criteria</b>	<p>Patient aged 12 years or over sustaining major trauma who fulfils any of the following criteria:</p> <ul style="list-style-type: none"> <li>▪ Systolic blood pressure &lt;90mmHg (may be indicated by absent radial pulse)</li> <li>▪ Heart rate &gt;110bpm</li> <li>▪ Considered to be at risk of significant haemorrhage (see examples below)</li> </ul> <p>The following injuries are examples of major trauma with a risk of significant haemorrhage:</p> <ul style="list-style-type: none"> <li>▪ Open or flail chest</li> <li>▪ Crushed, de-gloved or mangled limb</li> <li>▪ More than one fracture proximal long bone</li> <li>▪ Amputated limb proximal to wrist or ankle</li> <li>▪ Penetrating wound to head, neck, torso</li> <li>▪ Any patient where haemostatic agent (e.g. Celox) or CAT tourniquets have been applied</li> </ul>
<b>Exclusion criteria</b>	<p>Patient aged under 12 years old            Onset time for injury or suspected injury &gt;3 hours            External haemorrhage is now stopped and no suspected significant internal bleeding            Isolated head injury            Known hypersensitivity to tranexamic acid            Known history of convulsion (risk of cerebral oedema)            Pregnancy</p>
<b>Cautions/Need for further advice</b>	Increased risk of thrombosis in patients taking oral contraceptives or with history of thrombotic events.
<b>Action if patient declines or is excluded</b>	Transport as a time critical emergency to the nearest trauma unit / major trauma centre (in accordance with trauma triage tool) with pre-alert to the receiving unit.

**PATIENT GROUP DIRECTION (PGD)**

<b>Tranexamic Acid</b>	<b>POM</b>
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DRUG DETAILS	
Name, form & strength of medicine	Tranexamic acid 500mg in 5 ml injection
Route/Method	Slow bolus intravenous injection in 1ml aliquots over 10 minutes Flushed with saline
Dosage	Loading dose of 1g (10ml).
Frequency	Single dose
Duration of treatment	Slow Intravenous injection in 1ml aliquots over 10 minutes
Maximum or minimum treatment period	One off dose
Quantity to supply/administer	1g (Two 500mg ampoules)
Side effects	<p><b>Nervous system disorders:</b> dizziness; convulsions, disturbed colour vision (discontinued)</p> <p><b>Cardio-vascular disorders:</b> malaise with hypotension, with or without loss of consciousness (generally following a rapid intravenous injection); arterial or venous thrombosis at any sites. Risk of thromboembolic events</p> <p><b>Gastro-intestinal disorders:</b> nausea; vomiting and diarrhoea.</p> <p><b>General disorders:</b> hypersensitivity reactions including anaphylaxis</p>
Advice to patient/carer	<p>Explain treatment and course of action</p> <p>Risk associated with the use of tranexamic acid</p> <p>Advise the needs for transport to the nearest trauma unit/ major trauma centre (in accordance with trauma triage tool).</p>
Follow up	Transport as a time critical emergency to the nearest trauma unit/ major trauma centre (in accordance with trauma triage tool) with pre-alert to the receiving unit.

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**PATIENT GROUP DIRECTION (PGD)**

<b>Tranexamic Acid</b>	<b>POM</b>
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<b>STAFF CHARACTERISTICS</b>	
Professional qualifications	State registered paramedic, nurse with current HPC/NMC registration.
Specialist competencies or qualifications	<ul style="list-style-type: none"> <li>Has undertaken appropriate trauma training to carry out clinical assessment of patient leading to diagnosis that requires treatment according to the indications listed in this PGD</li> <li>Has undertaken appropriate training for working under PGDs for the supply and administration of medicines</li> </ul>
Continuing education & training	The practitioner should be aware of any change to the recommendations for the medicine listed. It is the responsibility of the individual to keep up-to-date with continued professional development

<b>REFERRAL ARRANGEMENTS AND AUDIT TRAIL</b>	
Referral arrangements	Transport as a time critical emergency to the nearest trauma unit/ major trauma centre (whichever is nearest) with pre-alert to the receiving unit.
Records/audit trail	<ul style="list-style-type: none"> <li>Patient's name, address, date of birth and consent given</li> <li>Contact details of GP (if registered)</li> <li>Diagnosis</li> <li>Dose and form administered</li> <li>Batch and expiry date details</li> <li>Advice given to patient (including side effects)</li> <li>Informed consent from patient</li> <li>Signature/name of staff who administered or supplied the medication, and also, if relevant, signature/name of staff who removed/discontinued the treatment</li> <li>Details of any adverse drug reaction and actions taken including documentation in the patients medical record</li> </ul>

References/Resources and comments	BNF 62, 2011 BNF for children 2011-2012 2.11 CRASH-2 (Clinical Randomisation of an Antifibrinolytic in Significant Haemorrhage 2) <a href="#">Summary of Product Characteristic (SPC)</a>
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Useful telephone numbers:

**Major trauma centre:**

Frenchay Hospital, Bristol (trauma team leader)	07703 886 400
Frenchay Hospital, Bristol (red phone)	0117 956 03 03
John Radcliffe Hospital, Oxford (red phone)	01865 765 740
University Hospital, Southampton (red phone)	02380 796 666

**Trauma units:**

Bristol Royal Infirmary	0117 342 29 28
Gloucester Royal Hospital	08454 225 126
Great Western Hospital, Swindon	01793 604 100
Royal United Hospital, Bath	01225 319 078
Salisbury District Hospital	01722 320 424

**Non-trauma unit emergency department**

Cheltenham General Hospital	08454 223 565
Weston General Hospital	01934 618 340

GWAS Clinical Support Desk (CSD) 01454 455 437

GWAS Special Operations Desk (SOD) 01454 455 469

