

Major Trauma Standard Operational Procedure

Key Points

- This SOP outlines how Trauma patients are managed at Frimley Health
- The **general principles of trauma management and governance are the same** for both the Frimley Park and Wexham Park sites but there are some differences, due to Frimley Park belonging to the Southwest London and Surrey Trauma Network, and Wexham Park belonging to the Thames Valley Trauma Network.

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Abbreviations

AAP	Automatic Acceptance Protocol
AD	Assistant Director
ATLS	Advanced Trauma Life Support
CAG	Clinical Advisory Group
ETC	European Trauma Course
HEMS	Helicopter Emergency Medical Service
M&M	Mortality and Morbidity
MTC	Major Trauma Centre
OARS	Online Acute Referral System
RAF	Risk Assessment Framework
RCR	Royal College of Radiologists
SPA	Supporting Professional Activity
SWLSTN	Southwest London and Surrey Trauma Network
NMTR	National Major Trauma Registry
TCDG	Trauma Care Delivery Group
TTL	Trauma Team Leader
TU	Trauma Unit
TVTN	Thames Valley Trauma Network

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Introduction

This document outlines how Trauma patients are managed at Frimley Health and the management and governance processes in place to support this. The general principles of trauma management and governance are the same for both the Frimley Park and Wexham Park sites but there are some differences, due to Frimley Park belonging to the Southwest London and Surrey Trauma Network and Wexham Park belonging to the Thames Valley Trauma Network. Major Trauma Networks were established in 2010 as a response to the NCEPOD report – '**Trauma: Who Cares**'.

The aim of this SOP is to standardise the way in which we manage Major Trauma at Frimley Health, according to evidence based practice and relevant guidelines. This SOP will reflect current practice, enhance best practice and improve patient safety for all Major Trauma Patients at Frimley Health.

Site details

Frimley Park	Wexham Park
Frimley Park is a Trauma Unit (TU) FPH receives trauma from various stakeholders including: South East Coast Ambulance Service South Central Ambulance Service Air Ambulance services based in Hampshire, Oxford, and Surrey. Voluntary ambulance services may also bring patients as well as some who may self-present with serious injury. Major trauma should be triaged to the Major Trauma Centre (MTC) at St Georges by the pre-hospital services using the relevant trauma bypass decision tool. Major trauma cases may arrive if the pre-hospital team feel that they need immediate interventions (this is likely to be related to a haemorrhage or airway issue). In these cases time at the TU should be viewed as a 'pit stop' to render the patient suitable for onward transfer to the MTC. Cases suitable for TU care will be admitted by the relevant speciality as per the FPH Acute Admissions Policy. The Clinical Lead for Major Trauma at Frimley Park is Dr James Raitt, Consultant in Emergency Medicine	Wexham Park is a Trauma Unit (TU) WPH receives trauma from various stakeholders including: South Central Ambulance Service Air Ambulance services based in Oxford. Voluntary ambulance services may also bring patients as well as some who may self-present with serious injury. Major trauma should be triaged to the Major Trauma Centre (MTC) at the John Radcliffe Hospital in Oxford by the pre-hospital services using the relevant trauma bypass decision tool. Major trauma cases may arrive if the pre-hospital team feel that they need immediate interventions (this is likely to be related to a haemorrhage or airway issue). In these cases, time at the TU should be viewed as a 'pit stop' to render the patient suitable for onward transfer to the MTC. Cases suitable for TU care will be admitted by the relevant speciality as per the WPH Acute Admissions Policy. The Clinical Lead for Major Trauma at Wexham Park is Dr Anna Galley, Consultant in Emergency Medicine.

Trauma Networks

The NCEPOD 2007 report suggested that almost 60% of major trauma patients received a standard of care that was less than good practice with avoidable deaths still occurring. This led the National Audit Office to recommend the development of regional trauma networks in England.

Following on from this recommendation, the NHS reorganisation created a series of Regional Networks. In England there are now 27 designated Major Trauma Centres. The London network started in April 2010 and the Trauma Networks across England started operating in April 2012. Following on from the introduction of the Major Trauma Networks in England there has been a move away from patients being taken to their nearest Emergency Department as a default and instead taken to the most appropriate hospital. This may be a major trauma centre or a trauma unit. This ensures that the most severely injured patients receive the optimum care without overloading the MTC.

Each network has a Clinical Director, who is supported by a Network Manager. Their roles are concerned with network governance and quality assurance as well as providing strategic direction.

Frimley Park site	Wexham Park site
The South West London and Surrey (SWLSTN) Trauma Network consists of a Major Trauma Centre - St George's Hospital in Tooting and seven trauma units: • Kingston Hospital • Croydon University Hospital • St Helier Hospital • Royal Surrey County Hospital • Frimley Park Hospital • St Peter's Hospital • East Surrey Hospital  The Major Trauma Centre consists of all major specialties on one site and the trauma team is led by a consultant in Emergency Medicine. More details about the SWLSTN are available at https://swlstrauma.net/about	The TVTN Trauma Network consists of a Major Trauma Centre – The John Radcliffe Hospital in Oxford and five trauma units: • Royal Berkshire Hospital • Wexham Park Hospital • Stoke Mandeville Hospital • Milton Keynes Hospital • Great Western Hospital  The Major Trauma Centre consists of all major specialties on one site.

Key personnel and responsibilities

Chief Executive	Caroline Hutton
Medical Director / Caldicott Guardian	Timothy Ho
Executive Lead / Escalation for transfer issues	Kirstin MacDonald AD for Emergency Medicine
Clinical Lead for Major Trauma (Frimley site)	James Raitt Emergency Medicine Consultant
Clinical Lead for Major Trauma (Wexham site)	Anna Galley Emergency Medicine Consultant
Nursing Lead	Fiona Rodney, Matron ED
Rehabilitation Lead(s)	Clare Watson, Physiotherapist Neuro FPH Jo Burns, Physiotherapist MSK FPH Samantha Gavin Physio WPH
Trauma Nurse Practitioner	Siobhan Page (FPH), Faith Paglomutan (WPH)
NMTR Team	FPH Charn Williams, ED Admin & Clerical WPH Magdalena Kuzmanovska (T&O Clinical Data Manager) and Felicity Hawkins, Orthopaedic Data Co-ordinator

Site Management Process

The Trauma Care Delivery Group (TCDG) has a multidisciplinary membership with the aim of overseeing trauma delivery at each site. Terms of Reference (Appendix 1) have been ratified for this group and the group meets quarterly at least. Minutes are available on request. The Chair is the local lead clinician for trauma and dedicated SPA time is given for this role (1 SPA).

Membership of Trauma Care Delivery Group

- Chair - Clinical Lead for Trauma
- ED secretary (minutes)
- Directorate level representative (Currently AD for Emergency Medicine)
- Consultant for Orthopaedics
- Consultant for Surgery
- Consultant for Anaesthesia & ICU
- Consultant Radiologist
- Consultant Paediatrician
- Transfusion lead
- Rehabilitation leads
- Trauma Nurse Co-ordinator
- Lead for Acute Pain
- ED Matron
- TARN team
- Resuscitation Practitioners

The group maintains risk and governance logs and reviews key findings from the Trauma Morbidity and Mortality meeting and reviews actions from the Trauma Network CAG meetings.

All issues relating to local trauma care and interaction with the Network are discussed at this group. When a member of the TCDG is unable to attend the meeting, a deputy from that specialty should attend.

Operational guidelines

Frimley Park site	Wexham Park site
The SWLSTN trauma network guidelines are available at https://swlstrauma.net/guidelines these provide guidance on the majority of trauma related issues and presentations.	The TVTN trauma network guidelines are available via the FHFT intranet, there is no publicly available website

Role of the Trauma Team

A 'pre alert' may be received on the priority phone from the ambulance service or patients may self-present. Assessment against standard triage criteria will determine the need for a trauma call. Any member of triage staff may initiate a trauma call which is then put out via the 2222 system. The caller should state:

Trauma Call in Resus Now or Trauma Call in Resus ETA xx minutes

Switchboard will then initiate this.

Criteria are listed by the priority phone and are on the clinical guidelines App and the intranet. (see Appendix 5). Helicopter cases at Frimley Health require a call to switchboard to 'Activate the helipad' and 'Activate the trauma team.'

At WPH a 'Code Red Trauma Call' can be activated in case of trauma with life threatening haemorrhage. This mandates contact with consultants of all specialities involved in trauma and the transfusion lab will receive the trauma call.

The Trauma Team consists of the following responders/roles

Role	Operator/Responder	Tasks
Team leader	ST3 doctor or above with formal training in trauma management. Between 0800 and 0000 this will be the ED consultant directly or in a role supervising the ED middle grade	Control of team Co-ordination of investigations and prioritization of tasks Check and complete documentation Arrange transfer if needed. Hands off patient
Airway	Anaesthetist/intensivist of ST3 and above or Outreach Consultant +/- ODP. This team must always be RSI competent	Airway maintenance Induction and maintenance of anaesthesia Control of cervical spine Overview of massive haemorrhage or ventilation problems
Primary Survey	An ATLS trained doctor: e.g., FY2 or above in EM, Surgery, Orthopaedics	Conduct primary survey Chest drain insertion
Doctor 2	Will be FY2 or above in EM / Orthopaedics / Surgery	Vascular access Urinary catheter Procedures as determined by team leader
Nurse 1	Resuscitation room nurse - TILS or higher trained	Attach monitoring Assist with IV access and bloods

Nurse 2	Second resuscitation room nurse	
Scribe	One of the HCA / Nurses trained in this role	Complete trauma documentation Ensure team sign in
Radiographer		Ensure CT scanner immediately available. Obtain chest and pelvic XR if required.
Porter	ED porter will be available	

Orthopaedic / Surgical Registrars will be non-resident after 2200 hours. The team leader is directly empowered to call the Orthopaedic/Surgical Consultants as needed. Out of hours the ED consultant must be informed of all paediatric major trauma calls and adult trauma calls if there is suspicion of significant injuries, this is done via switchboard who will call the ED consultant. A representative (either Registrar or SHO) from General Surgery and Orthopaedics and ITU should attend every trauma call.

Trauma Team Action Cards are available in the trauma folders kept in the resuscitation room. These are shown in Appendix 6.

Patients who are unable to be managed locally due to the seriousness of their condition should have the minimum necessary done in order to facilitate a safe and timely transfer to the MTC. This is controlled by the Trauma Team Leader in discussion with the MTC Consultant for Major Trauma.

Transfers to the regional MTC

Frimley Park site	Wexham Park site
The SWLSTN MTC trauma SOP states: Any trauma patient with significant injury burden should be discussed ED to ED by the Trauma Team Leader (TTL) at the TU and the MTC Consultant acting as TTL on Blp 8021 via switchboard 020 8672 1255. The TTL at the MTC will be able to offer clinical advice 24/7. It will be agreed by the TTLs that some patients will be for immediate transfer. https://swlstrauma.net/documents/sop.pdf	Transfer to MTC - ED consultant to consultant if the patients fits the AAP (see Appendix 4). The MTC TTL can be contacted via the John Radcliffe switchboard, bleep 1240. All neurosurgical injuries require an OARS referral. Pelvic and spinal injuries that remain in Wexham or do not fit the AAP should have an OARS referral done. https://oars.ouh.nhs.uk/ Burns - We refer to Chelsea and Westminster as a general rule. Via TRIPs. Head injuries - those that do not require MTC care are admitted under T&O.

Patients with acute life or limb threats are transferred from ED to ED. Escorting personnel must be transfer trained and appropriate for the patient's clinical condition.

Assistance with time critical transfers

Frimley Park site	Wexham Park site
Transfer requests should be made via ambulance control by dialling 999. Air Ambulance Kent Surrey Sussex offer a time critical transfer service for selected patients. Cases should be discussed with the HEMS dispatch desk at the earliest opportunity on 0300 123 5811 or 0782 798 2152.	Transfer requests should be made via ambulance control by dialling 999. No time critical transfer service currently exists within TVTN. HEMS may be able to help for adult patients and SORT will assist with paediatric transfers.

Imaging of the Trauma Patient

The Trauma Team Leader is responsible for the choice of imaging and this decision should be made in conjunction with the on-call radiologist. There are specific challenges around injury identification in older patients, (see Frimley Health imaging in older and or frail patients guideline [Frimley Guidelines \(fhft.nhs.uk\)](https://www.fhft.nhs.uk)) and in children (see RCR paediatric imaging document <https://www.rcr.ac.uk/publication/paediatric-trauma-protocols>).

Use of Trauma CT

The radiology department has approved the use of the whole body trauma CT in the poly-trauma patient. Those patients with injuries spanning two body regions or subjected to a significant kinetic energy should have a trauma scan which includes head, neck, chest, abdomen, pelvis, spine (and lower limbs as needed).

In some cases, a more refined scan pattern may be indicated. However, all unconscious head injuries should have their neck imaged at the time of the first head CT scan. CT scanning should be undertaken for patients prior to transfer, there may be rare exceptions to this in time critical cases, but these should be discussed with the MTC TTL (FPH) or the ED Consultant (WPH).

The radiographer or radiologist will be informed at the earliest opportunity if the images to be sent to the MTC via direct push with IEP available for backup.

Reporting

The trauma team leader should wait in radiology when the scan is complete for a 'primary radiology survey' sheet to be completed by the radiologist (0700-2200). This is a templated sheet for a radiology primary report of significant findings. The preliminary and/or final written report will be issued in a timely way and must be read, actioned and acknowledged by ED. Any critical findings or significant changes to the primary survey or preliminary report will be phoned through to ED registrar. Acute trauma pan-CT should be highlighted to reporting onsite radiologist or out-of-hours reporting service to ensure reported within 60minutes of scan acquisition.

Image Transfer to the MTC

Frimley Park site	Wexham Park site
1 A written radiology report will accompany all trauma patients having been printed direct from the referring institution RIS or PACS or EPR radiology system.	1 A written radiology report will accompany all trauma patients having been printed direct from the referring institution RIS or PACS or EPR radiology system.
2 All images will be transferred via direct online push to MTC (St George's) PACS. This will transfer images into MTC PACS within seconds but does not carry the report. IEP available when the direct push is non-functioning or transferring to other institutions	2 All images will be transferred via direct online push to MTC (OUH) PACS. This will transfer images into MTC PACS within seconds but does not carry the report. IEP available when the direct push is non-functioning or transferring to other institutions
3 When the patient leaves prior to the report being ready, i.e., emergency transfer then a report will still required to be sent to the MTC.	3 When the patient leaves prior to the report being ready, i.e., emergency transfer then a report will still required to be sent to the MTC.

Massive Transfusion

2 units of O negative blood and 2 units of O positive blood are kept in the fridge in the Resuscitation Room at each site. WPH stocks 2 units of defrosted FFP in Blood Bank at all times.

The massive transfusion policy, [Frimley Guidelines \(fhft.nhs.uk\)](https://www.fhft.nhs.uk/guidance/massive-transfusion-policy/).

Key points

Activate the Major Haemorrhage protocol early via 2222 and establish clear communications with the lab.

NICE guidelines for Major Trauma (<https://www.nice.org.uk/guidance/ng39>) suggest:

1.5.23 In hospital settings do not use crystalloids for patients with active bleeding.

1.5.24 For adults (16 or over) use a ratio of 1 unit of plasma to 1 unit of red blood cells to replace fluid volume.

1.5.25 For children (under 16s) use a ratio of 1 part plasma to 1 part red blood cells, and base the volume on the child's weight.

Further details are in the SWLSTN guidance at <https://swlstrauma.net/documents/transfusion.pdf>

Use of Tranexamic Acid in head injuries

SWLSTN guidance states

Give 2g TXA in those with GCS 4 – 13 pre-CT scan and <3 hours since injury; in those GCS 14-15 who you can obtain a CT and administer within 3 hours: give 1g TXA if ICH on CT. If significant delay to CT consider 1g TXA if under 3 hours since injury

Definitive Care in the Trauma Unit

Admissions Policy

Patients will be admitted by the specialty that has overriding clinical primacy. This will be either Orthopaedics or General Surgery in most cases.

[Frimley Guidelines \(fhft.nhs.uk\)](http://fhft.nhs.uk)

Operating theatre

There is a dedicated 24/7 emergency theatre and cases may be booked via the theatre co-ordinator. If the emergency theatre is in use and the patient cannot wait, then the policy is to open a second theatre. This is agreed by the Theatre Management Group. There are dedicated orthopaedic operating theatres with Laminar flow systems as well.

Frimley Park site	Wexham Park site
Theatre 7	Theatre 4

Multiple Injury Patients

The majority of multiply injured patients will require transfer to the MTC via the ED to ED pathway. If not transferred (based on consultant decision) then the most significant injury takes primacy for the lead speciality.

Head Injuries

Head injury not requiring transfer to the MTC (see Appendix 1).

Frimley Park site	Wexham Park site
is a general surgical admission unless other injuries take primacy	is a Trauma and Orthopaedic admission unless other injuries take primacy

Spinal Injuries

Patients with suspected spinal injuries should be managed as per the spinal injury policy in appendix 6. The following table gives details of transfer to the MTC.

Frimley Park site	Wexham Park site
Patients with confirmed spinal injuries who do not meet the criteria for ED to ED transfer should be discussed with the on-call spinal surgical team as well as ensuring that the network policy is adhered to. Injuries above C3 are not dealt with operatively at FPH but injuries requiring conservative management (for example C2 peg or C1 lamina fractures) should be discussed with the on call spinal team at Frimley in the first instance. There is a spinal care pathway (appendix 8) to be used for these patients.	Pelvic and spinal injuries that remain in Wexham or do not fit the AAP should have an OARS referral done. https://oars.ouh.nhs.uk/ Injuries above C3 are not dealt with operatively at Frimley Health but injuries requiring conservative management (for example C2 peg or C1 lamina fractures) should be discussed with the on call spinal team at Frimley in the first instance. There is a spinal care pathway (appendix 8) to be used for these patients.

Rib Fractures

Trust wide guidance for rib fractures is available here: [Frimley Guidelines \(fhft.nhs.uk\)](http://fhft.nhs.uk) and via the Guidelines App.

Burns

Frimley Health is in the London and South East Burns Network <https://www.lsebn.nhs.uk> with Chelsea and Westminster Burns Centre being our default burns centre. Patients are referred via TRIPS www.trips.nhs.uk

Rehabilitation

Frimley Health provides a full TU Physiotherapy and Occupational therapy service. This includes a respiratory service on call. Services are available seven days a week. Coordination of patients' therapy will be via their medical team utilising all on site services as required. Specialist referral to care outside Frimley Park will be directed and assisted by the therapists with their specialised knowledge.

At Wexham Park Hospital, services are available seven days a week and include a respiratory overnight on call service. Patients therapy will sit with the team under which they are admitted. Those under the care of Trauma and Orthopaedics will be assessed under a blanket referral system. Those under outlying teams will be referred based on their needs via nursing handover. An assessment of patients ongoing needs will be made on discharge and appropriate referral to onward services will be made.

Speech and Language Therapy/Dietetics team services are also available to trauma patients as needed and may be accessed through the internal referral system, via Epic.

On discharge, patients will have a full discharge summary sent to their GP. If discharged to another healthcare provider then the multi-disciplinary team will ensure an accurate medical, nursing and therapy handover accompanies the patient. This should take the form of a Rehabilitation Prescription.

The rehabilitation prescription is a commissioned service from the Major Trauma Centre. Whilst it is not currently commissioned in Trauma Units it remains best practice. This provides a thorough nursing, medical and therapy handover to accompany the patient to their onwards care provider.

Mass Casualty/Major Incident involving Trauma

In the event of a Mass Casualty/Major Incident involving Traumatic injuries, this SOP is to be suspended and the Frimley Health Major Incident Policy implemented. Further information on trauma in major incidents is available at

<https://www.england.nhs.uk/publication/clinical-guidelines-for-major-incidents-and-mass-casualty-events/>

Governance and Risk Management

The lead Resuscitation Practitioner will assist the Clinical Lead for Trauma in maintaining a 'Governance log' and a 'Risk Register'.

Governance Log

The Governance log will list all trauma related incidents by date and monitor progress and closure. Cases are reviewed in detail at the Trauma M&M meeting and the log is visible to the trusts Quality and Safety Board.

Risk Assessment Framework

The risk assessment framework (RAF) will list those issues which pose a threat to the trauma agenda in the trust. They may be identified by the Governance log or by local subject matter experts. The risk assessment framework is cross site and maintained by the AD for Emergency Medicine.

M&M Process

The Emergency Department Trauma M&M (mortality and morbidity meeting) is the primary forum for the review of trauma cases. Cases can be referred to the Trauma M&M by any clinician and learning points are shared through the specialty representatives and through the ED Clinical Governance framework. Key points are also shared at the TCDG.

Trust NMTR data is reviewed as part of the M&M process as well as through the hospital clinical audit and excellence programme.

Training requirements

This SOP should be made available to all new starters at the Trust working with Trauma patients as part of induction, and available on the trust intranet. All specialty teams involved with Trauma have their own standards for induction, training and development. This SOP seeks to complement existing standards. With this in mind, it is expected:

- All clinical training and development regarding Trauma should include latest guidance from the relevant trauma network
- Access to ATLS/ETC (as minimum) accredited courses
- All members of the Trauma team are expected to engage with Trust Trauma M&M meetings
- All clinicians based at the Frimley Park site who are involved with Trauma should complete the Network online trauma training available at <https://swlstrauma.net/register>

External review and governance

Frimley Park site	Wexham Park site
SWLSTN Clinical Advisory Group (CAG) Chaired by SWLSTN Clinical Director, a multi-Trust group with representation from all TU's in South West London and Surrey, and St George's Hospital. FPH is represented by the Trust Trauma Lead. SWLSTN issues are discussed and managed by the governance log (held by SWLS Network Manager). Review of TU performance will be directed by the Trauma Network Manager and is currently done on an annual basis as a self-reporting peer review.	Bimonthly TVTN Board meetings chaired by the network clinical lead. Review of TU performance will be directed by the Trauma Network Manager and is currently done on an annual basis as a self-reporting peer review.

Transfer of Care of Patients back from the MTC

Both sites have signed up to the Network Transfer of Care Policy.

Patients will be identified at the MTC as ready for transfer at 2 days prior to the clock starting (**Day zero minus 48**). Bed management teams are notified in the TU at this point.

Day zero minus 24 has a further alert to the TU bed management team.

Day zero is patient transfer day.

Delays in transfer of care should be highlighted to the hospital site management team (Silver Command).

Appendix 1: Terms of Reference for Trauma Care Delivery Group

1. Chair

- 1.1. The Trauma Care Delivery Group is chaired by the Clinical Lead for Trauma within the Trust with Executive support.
- 1.2. This ensures a direct link to the Trust Executive Group and Board and ensures the Trust wide perspective of trauma services.

2. Membership

- 2.1. Membership of the group should include the following or a nominated representative:
- 2.2. Executive Lead for Trauma – currently the AD for Emergency Medicine
- 2.3. Clinical Lead for Trauma
- 2.4. Clinical Leads for Surgery, Orthopaedics, Emergency medicine, Radiology
- 2.5. Nursing representation - ward and ED
- 2.6. Rehabilitation representative
- 2.7. Ambulance service representation
- 2.8. Secretarial support
- 2.9. NMTR co-ordinator
- 2.10. Ad hoc as required but on distribution list:
- 2.11. Pharmacist

3. Frequency of Meetings

- 3.1. Meetings should be held quarterly. A minimum of 4 meetings should be held per year and scheduled in advance.
- 3.2. 1 – 1.5 hours should be allowed for each meeting.
- 3.3. Minutes should be taken of all meetings and circulated to all on distribution list prior to next meeting.

4. Purpose

- 4.1. To oversee all components of the Trust Trauma Service and ensure facilities, resources and capacity are sufficient to cope with demand.
- 4.2. To allow update from and feedback to the Trauma Network.

Appendix 2: Ordering Out of Hours CT

FHFT Out Of Hours Radiology Requesting Policy

1.1 Out of Hours Radiology Policy at Wexham Park Hospital applies between:

Modality	Weekdays (Monday – Thursday)	Weekends/ Bank Holidays (Friday – Sunday)
CT	20:00 – 08:00	17:00-09:00 next day *
Ultrasound	20:00 – 08:00	17:00-09:00 next day
Radiography	20:00 – 08:00	20:00-09:00 next day
Interventional Radiology	17:00 – 08:00	All day

* **Finish at 08:00 on Monday except on a Bank holiday when it ends at 09:00**

KEY POINTS WPH

- The On-call Radiographer at WPH is the first port of call for any OOH queries (apart from interventional radiology) and can be contacted on extension 152094 / 152757 or via switchboard.
 - CT radiographers will only vet and schedule **NICE guidance CT head, CT C-Spine, CT head for acute stroke**.
 - All queries for vetting and reporting must follow the guidance below and will be undertaken by the OOH Consultant Radiologist (AXON). Scans will be scheduled once vetted by the radiologist.
 - For **Ultrasound and MRI** related queries must be discussed with the On-Call WPH radiologist via switchboard.
 - The Consultant Interventional Radiologist on call is contactable via switchboard.
- Out of Hours Radiology Policy at Frimley Park Hospital applies between:

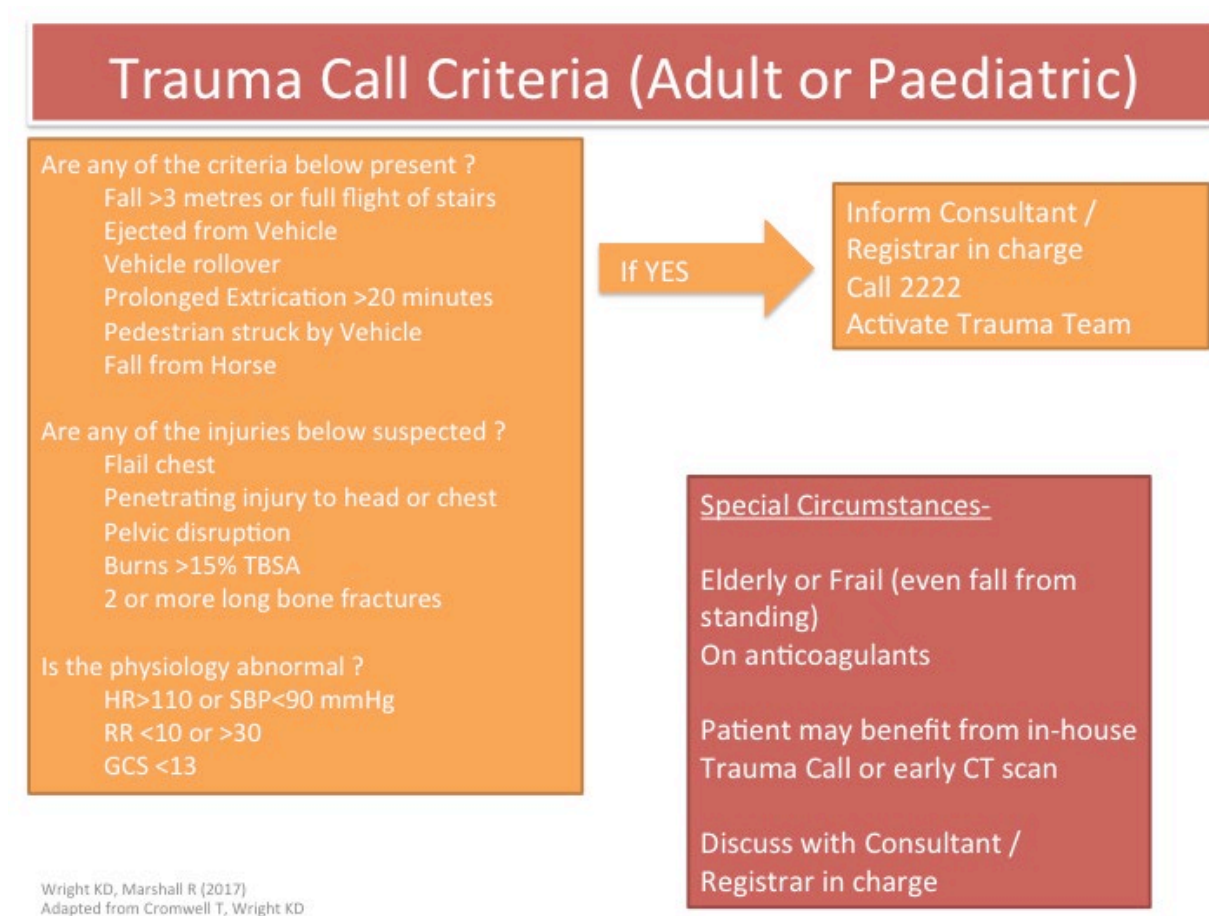
Modality	Weekdays (Monday – Thursday)	Weekends/Bank Holidays (Friday – Sunday)
CT	22:00 – 07:00	22:00-09:00 next day
Ultrasound	22:00 – 08:00	22:00-09:00 next day
Radiography	22:00 – 08:00	22:00-09:00 next day
Interventional Radiology	17:00 – 09:00	All day

KEY POINTS FPH

- The On-call CT Radiographer at FPH is the first port of call for any OOH queries (apart from interventional radiology) and can be contacted via bleep 5378
- CT radiographers will only vet and schedule **NICE guidance CT head, CT C-Spine, CT head for acute stroke**.
- All queries for vetting and reporting must follow the guidance below and will be undertaken by the OOH Consultant Radiologist (AXON). Scans will be scheduled once vetted by the radiologist.
- For **Ultrasound and MRI** related queries must be discussed with the On-Call FPH radiologist via switchboard.
- The Consultant Interventional Radiologist on call is contactable via switchboard.

Appendix 3: Trauma Team Activation Criteria

FPH Trauma Call Criteria



WPH Trauma Call Criteria

These can be accessed via the following links and via the Guidelines App.

Paediatric

[Frimley Guidelines \(fhft.nhs.uk\)](http://fhft.nhs.uk)

Adult

[Frimley Guidelines \(fhft.nhs.uk\)](http://fhft.nhs.uk)

Elderly

[Frimley Guidelines \(fhft.nhs.uk\)](http://fhft.nhs.uk)

Appendix 4 TVTN Automatic Acceptance Policy



Clinical Indications for Automatic Acceptance to the Oxford Major Trauma Centre

v4.2, September 2018



If a patient meets clinical indications for automatic acceptance to the Major Trauma Centre at the John Radcliffe Hospital (JRH), Oxford, **DO NOT DISCUSS WITH MTC SPECIALTIES**

Notify the MTC Trauma Team Leader of ALL CASES (paediatric and adult) – 01865 741166 Bleep 1240 (24/7)

Prior to transfer:

- Contact Ambulance Control (SCAS) and request an appropriate timed transfer – 0300 123 9822
- Transfer images to the JRH MDT server and ensure documentation +/- blood/FFP accompany the patient
- Arrange for an appropriate clinical escort and adequate fluid resuscitation to cover the transfer
- Refer to the TVTN Minimum and Necessary Trauma Transfer Protocol
- This MUST be activated by a senior clinician

There will be automatic acceptance to the JRH MTC for adult and paediatric (<16 years old) patients with any of the injuries listed below:

Body region	Injuries
POLY TRAUMA	- Significant injury <u>and</u> injury requiring specialist care at MTC - History of haemodynamic instability (consider DCS prior to transfer)
BURNS	- Multiple injuries <u>and</u> burn injury
NEURO	- Penetrating head injury - Refer to TVTN Time Critical Traumatic Brain Injury Pathway – JRH switchboard 01865 741166 Bleep 6609 or mobile 07587 390924
SPINE	- Spinal Cord Injured patient with trauma and radiologically confirmed abnormality - Dislocated spine - Open spine fracture
THORACIC	- Ruptured bronchus or diaphragm - Blood loss of more than 500ml immediately following insertion of chest drain or >250ml per hour for 3 consecutive hours (consider DCS prior to transfer) - Suspected aortic transection - Cardiac tamponade (consider DCS prior to transfer) - Penetrating chest injury with retained implement and/or haemodynamic instability
PELVIC + ACETABULUM	- Pelvic or Acetabular injuries thought by referring Unit's Orthopaedic team to require emergency or urgent surgery (open or displaced fractures) - History of haemodynamic instability (consider DCS prior to transfer) - For stable patients please make an urgent referral via OARS
EXTREMITIES	- De-vascularised limb - OPEN fractures of upper or lower LONG BONES (humerus, radius and ulnar, femur, tibia and fibula) - OPEN fractures of HINDFOOT or MIDFOOT - Excludes hand, wrist, forefoot or digit as per BOA standards for trauma
N.B. THIS IS A PLACEHOLDER FOR INFORMATION PERTAINING TO NATIONAL AMBULANCE STANDARDS ON INTER-FACILITY TRANSFER	

Appendix 5: Trauma Team Activation cards

Trauma Team Action Card: Team Leader

Role performed by: ED Consultant or ST3+ registrar.

Reports to: Duty ED Consultant.

Tasks :

1. Receives ambulance handover
2. Maintains control of team
3. Co-ordinates and prioritises team actions
4. Ensures patient is accompanied by appropriate personnel for all transfers
5. Liaises with MAJOR TRAUMA CENTER re urgent transfers
6. Liaises with senior surgical specialities at Frimley Park/Wexham Park
7. Ensures all trauma narrator documentation is complete prior to patient leaving ED

Trauma Team Action Card: Airway Doctor

Role performed by: Anaesthetist, RSI competent ED Consultant/Middle Grade

Reports to: Team Leader, Critical Care Consultant

Tasks :

1. Assessment of the airway
2. Advanced airway techniques such as RSI, surgical airway
3. Insertion of arterial and central venous lines if needed
4. Liaison with Critical Care
5. Accompanies the patient on transfers to CT, theatre, out of hospital
6. Maintains an overview of the resuscitation with regards to ongoing critical care needs

Trauma Team Action Card: Doctor 1: Assessment Doctor

Role performed by: ED middle grade, Surgical/Orthopaedic Core trainee

Reports to: Team leader

Tasks :

1. Conducts the primary survey of the patient
2. Takes initial history (AMPLE) from patient
3. Carries out procedures mandated by the primary survey such as chest drain
4. Conducts secondary survey
5. Documents all actions and findings

Trauma Team Action Card: Doctor 2: Access and Procedures Doctor

Role performed by: ED Core trainee

Reports to: Team leader

Tasks :

1. Obtains intravenous access
2. Draws bloods and ensures samples are sent to laboratory
3. Orders x-rays as requested by team leader
4. Carries out urinary catheterisation of patient
5. Carries out other procedures as directed by team leader

Trauma Team Action Card: Nurse 1

Role performed by: Resuscitation room nurse

Reports to: Team Leader

Tasks :

1. Attaches monitoring to patient
2. Ensures adequate exposure of patient

Trauma Team Action Card: Nurse 2

Role performed by: Resuscitation room nurse

Reports to: Team leader

Tasks :

1. Assists nurse 1
2. Ensures all nursing documentation is complete
3. Family liaison

Trauma Team Action Card: Airway Assistant: ODP / Nurse 3

Role performed by: ODP or 3rd ED nurse

Reports to: Airway doctor

Tasks :

1. Assist the airway doctor with airway procedures

Trauma Team Action Card: Scribe

Role performed by: ED doctor, nurse

Reports to: Nurse 1 & Team Leader

Tasks :

1. Completes trauma narrator documentation

Appendix 6: Spinal Care Pathway

Frimley Health Spinal Fracture Protocol

These are very serious injuries, and the correct management of these patients is paramount. If you have any questions about these guidelines or any query regarding the acute management of any patient with a suspected spinal cord injury (SCI), please do not hesitate to contact the Major Trauma Centre or any of the Consultant Spinal surgeons, even if they are not on call.

Suspected Cervical/Thoracic/Lumbar fracture

- Immobilise until neurology/stability assessed
- ASIA chart – Day 0, pre-op, post-op and at 4/52
- Green form (Spinal precautions) to be filled in by SpR on call

Radiology

- Asymptomatic, awake, alert, non-intoxicated, non-tender, no distraction – Cervical x-ray not indicated
- 3 standard views radiographs with CT fractured region
- Whole spine MRI for non-contiguous fracture
- Neck pain or tenderness with normal XR (+/- CT) consider flexion/extension views or MRI before immobilisation removed
- Obtunded patient with normal XR – only remove immobilisation following
 - o Dynamic flexion/extension views under fluoroscopy
 - o Normal MRI
 - o Discretion of ED/ITU/Spinal SpR or Consultant

Cervical Spine Fracture/Dislocation Injuries

- Early closed reduction in awake patient as soon as possible
- Closed reduction if additional superior injury - not recommended
- Unable to formally examine patient – MRI for suspected disc herniation
- MRI if failed attempt at closed reduction

Bed Placement

- SCI with neurological loss – Admit to ITU/SADU
- C1 - T6 fracture with no SCI – Admit to ITU/SADU
- T7 – S5 fracture with no SCI – Admit to Orthopaedic ward

Paediatric – As adult. Beware SCIWORA requires MRI.

Treatment Guidelines

Cervical Fractures

- Transfer from spinal board and exchange ambulance rigid collar for padded Miami J collar.
- ASIA chart – Day 0, pre-op, post-op and 4/52
- Consider halo crown and jacket for unstable fractures
- Discuss with on call Spinal consultant

Thoracic Fractures

- Plain film +/- CT/MRI for further anatomical review
- ASIA chart – Day 0, pre-op, post-op and 4/52
- Stability – Assess by Spinal surgeon and treatment considerations to be planned.
 - o 1 column injury – Mobilise without restriction

- 2 column injury – T5 and above – CTLSO or surgery, T6 and below – TLSO/surgery
- 3 column injury – Stabilise in brace until surgical fixation

Lumbar Fractures

- Plain film +/- CT/MRI
- ASIA chart – Day 0, pre-op, post-op and 4/52
- Transverse process fractures – Manage conservatively and mobilise as pain allows
- Spinous process fractures – Manage conservatively and mobilise as pain allows
- Lumbar body/pedicle/lamina
 - 1 column injury – Non operative management
 - 2 or 3 column injury – Conservative/surgical management decided by surgeon

Immediate ED and Ward Management

Airway with Cervical Spine Protection

- Clear the airway – Foreign bodies, suction
- Protect the airway – Do not hyperextend neck, use the chin lift technique
- Minimise neck movements and protect with blocks and tape
- Consider naso/oro-pharyngeal airway and discuss with anaesthetic team
- Remember in high cervicothoracic injuries, intubation can lead to severe bradycardia/cardiac arrest – consider pre-oxygenation, hyperventilation with waters circuit, use topical anaesthetic spray, have atropine available (0.3-0.6mg IV).

Breathing

- Intercostals +/- diaphragm may be paralysed and cough reflex lost
- Review breathing i.e. rate, depth, shallow, abdominal, chest asymmetry
- Respiratory fatigue – drop SaO2 despite O2 therapy
- Serial vital capacity recording – deterioration can signal respiratory fatigue
- Perform arterial blood gases and serial CXR to monitor
- Vital capacity is the simplest and most appropriate measure of pulmonary function following SCI, due to the excellent correlation between VC and nearly all other pulmonary function tests. Expect Tidal Volume (TV) to be 10ml/kg (or slightly less) i.e. 60kg person – 600ml TV. If the FVC is less than 1 litre the patient is at high risk of respiratory failure & should be monitored very closely and ventilatory support considered

Circulation

- Neurogenic shock is due to sudden loss of sympathetic control (injury above T6) and systolic BP 90mmHg may be normal
- Remember hypovolaemic shock though due to other injuries
- Maintain BP 90-100mmHg and urine output >30ml/hr
- Administer IV fluids and consider CVP line for fluid balance monitoring
- If pulse <40bpm consider IV Atropine 0.3-0.6mg bolus
- ECG monitor – consider cardiac contusion with thoracic injuries
- With cervical SCI, risk of asystole with pharyngeal / endotracheal suction or attempted intubation. Avoid desaturation and consider IV Atropine.
- If neurogenic shock causing ongoing hypotension that is not responding to fluid replacement acutely then consider dopamine, noradrenaline, phenylephrine or ephedrine.

Neurological Assessment

- Careful assessment is critical and essential to review level of injury and possible deterioration or improvement over time
- Nurse flat to avoid postural hypotension avoiding cord blood supply compromise
- For vertebral fractures, there needs to be a comprehensive neurological screen which may lead to an ASIA assessment if the outcome of the screen warrants it. If during the screen there is evidence of complex neurological findings eg numbness, weakness, respiratory involvement which may indicate cord involvement, then an ASIA should be completed. If there is no evidence of spinal cord involvement, then a neuro screen is enough. Every case is individual and the consultant/therapist should use their clinical expertise to assess the level of assessment required.
- Perform American Spinal Injuries Association (ASIA Chart) exam and formally record on admission and every 72hrs subsequently
- Consider marking pin-prick sensory level for future reference
- Careful anal sensation/tone/power exam is very important prognostically

Imaging

- Non-contiguous lesions are recognised in 5% patients with SCI, therefore perform whole spine CT and MRI scan – review for fractures, prolapsed disc, cord haematoma, soft tissue lesion
- Consider CT re cervicothoracic junction if plain films not adequate. CT also useful to review pedicle anatomy if surgery under consideration

Steroids

- The use of high dose steroids in the management of SCI has not been recommended or supported on current evidence by the British Association of SCI Specialists

Moving/Handling

- Beware flaccid limbs in SCI patient with spinal shock – possible fracture, rotator cuff injury, skin damage on bed sides etc
- Tetraplegic patient – 5 person roll (1st Leader controlling head/neck, 2nd Shoulders, 3rd Hips, 4th Legs, 5th supporting arms, exam skin, move pillow, bowel care etc)
- Paraplegic patient – 4 person roll (1st Leader reviewing skin/pillows/bowel care, 2nd Shoulders, 3rd Hips, 4th Legs)

Bed Placement

- SCI with neurological loss – Admit to ITU/SADU
- C1 - T6 fracture with no SCI – Admit to ITU/SADU
- T7 – S5 fracture with no SCI – Admit to Orthopaedic ward

Thromboembolic Management

- PE is leading cause of mortality in SCI patients
- Consider TED stockings +/- mechanical pumps if available
- Low molecular weight heparin for 12 weeks minimum: Dalteparin 5000 units daily or adjusted according to renal function and weight unless head injury or acute spinal surgery planned.

Gastric Protection

- SCI patients have increased risk of peptic ulceration so consider proton pump inhibitor for at least 4/52 treatment (e.g. omeprazole 20mg od)
- SCI patients will often develop an ileus. Patients should be kept nil enterally for first 48 hrs post injury. Consider awaiting return of audible bowel sounds before feeding as

gastric dilation and abdominal distension may cause diaphragmatic splinting in a respiratory compromised patient

Autonomic Dysreflexia

- Any SCI patient with paralysis at T6 or above is at risk of reflex stimulation of autonomic nervous system leading to increased peripheral vasoconstriction, increased cardiac output and an acute hypertensive crisis. Autonomic dysreflexia is often associated with bradycardia since there is normal vagal control of the heart and the only mechanism to reduce cardiac output is to slow the heart rate
- Often crisis is precipitated by painful influence e.g. blocked urinary catheter, constipation, bowel evacuation, pressure-sore inflammation etc
- Rectify cause and sit patient up to reduce venous return (if spine stable)
- Consider nifedipine capsules 10mg bitten/pierced sublingually to induce vasodilation

Urinary Tract Management

- Pass catheter (urethral or supra-pubic)
- Priapism is usually self-limiting and does not require treatment
- Good fluid balance and long-term indwelling urethral catheter.
- Contact SCIC for more advanced/long-term management e.g. intermittent self catheterisation techniques

Bowel Management

- Aim to achieve regular and predictable bowel emptying at socially acceptable time/place avoiding constipation or autonomic dysreflexia
- Be aware of acute constipation with overflow diarrhoea due to opiate analgesics
- During period of spinal shock, consider gentle digital faecal evacuation with good lubrication to avoid any local trauma
- Consider use of regular rectal stimulants e.g. 2 glycerine suppositories pre breakfast with hot drink, then digital stimulation and manual evacuation. Regular sodium docusate 100-200mg bd and senna bd to counteract slow bowel transit.
- Please refer to <http://www.mascip.org.uk/guidelines.aspx> for more comprehensive guidelines

Skin

- Very high risk due to lack of sensation, muscle inactivity, sluggish circulation. Can take only 1hr to develop and significantly affect rehab
- 40° side to side turn is minimum with appropriate pillow support
- Turn patient every 2 hours and consider a pressure reduction mattress

Joint Mobility

- Passive movement and mobility is very important to help ROM and prevent contractures
- Daily physiotherapy input is required but passive stretching of joints should be maintained by all health care professionals e.g. during routine care/turning etc.

Psychology/Family Issues

- Involve Psychology team/Psychiatrists early – Depression, Post Traumatic Stress Disorder
- Social Services involvement – support networks, helping transition to SCI implications

References/Further resources for reading

ASIA Chart - http://www.asia-spinalinjury.org/publications/59544_sc_Exam_Sheet_r4.pdf

RNOH Draft Guidelines - Brief Guide to Acute Management after Spinal Cord Injury

BOA Guidelines – The initial care and transfer of patients with spinal cord injuries
<http://www.boa.ac.uk/Publications/Documents/Care%20and%20Transfer%20of%20Spinal%20Patients.pdf>

Multidisciplinary Association of Spinal Cord injury Professionals (MASCIP) -
<http://www.mascip.co.uk/Home.aspx>

American Spinal Injuries Association - www.asia-spinalinjury.org/

Paralyzed Veterans of America - www.pva.org

Spinal Injuries Association (SIA) - <http://www.spinal.co.uk/>

British National Formulary - <http://bnf.org/bnf/index.htm>

FPH Bed placement -
<http://amber.docstore/Policies/Clinical%20and%20Nursing%20Policies/Archived%20Files/BED%20PLACEMENT%20SPINAL%20INJURED%20PATIENTS%20Jan%202006.doc>

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This guideline has been registered with the Trust. However, clinical guidelines are guidelines only. The interpretation and application of clinical guidelines will remain the responsibility of the individual clinician. If in doubt, contact a senior colleague or expert. Caution is advised when using guidelines after the review date.

This guideline is for use in Frimley Health NHS Foundation Trust hospitals only. Any use outside this location will not be supported by the Trust and will be at the risk of the individual using it.

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3.0	June 2022	Dr James Raitt and Dr Anna Galley	Final	
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Document Type	Document Name
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