

**“It’s the *whole* system  
that will make the  
difference”**

# **First Report from the North West Trauma Clinicians**

Marion Hughes February 2011

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Chair of N. W. Major Trauma Clinical Reference Group

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**This report summarises the current areas of agreement, concerns, outstanding actions and some potential metrics to measure the success of the North West Trauma Programme . It marks the beginning of a continuous quality improvement programme for major trauma services.**

## Report from North West Trauma Clinical Workshops,

### Executive summary

A national programme of Trauma service redesign was announced by the Coalition Government in the Revision to the Operating Framework for the NHS in England in June 2010,<sup>1</sup> in response to the publication of the NAO report “Major Trauma Care in England” (2010)<sup>2</sup>. Many previous reports<sup>3,4</sup> have tried to raise awareness of the variable standards and outcomes in trauma care across the UK, and across the North West region. The NAO report further stated that the NHS is not delivering value for money. The trauma programme has been mandated with a high priority, evidenced by the requirement for regions to develop plans in 2010-11, and to begin implementation in April 2011.

In the current environment of severe economic stringency, a programme of growth and investment is unrealistic. The only way to improve patient care and outcomes is to:

- review our current resources,
- redesign patient pathways through collaborative working across traditional boundaries
- get the patient to the right place for the right treatment in the optimum time
- ensure quicker access to quality rehabilitation services.

It is recognised nationally that rehabilitation services are inadequate, uncoordinated, and is the one area of this programme which will need investment. The North West has been selected the pilot site for England, to develop and enhance rehabilitation services with the opportunity to learn from experience gained by the military at Hedley Court.

### Clinical Engagement Programme

Clinical advice was sought to inform the preferred model for trauma care in the North West via the broad based Clinical Reference Group meetings (from April 2010 onwards) and a series of specialty specific workshops (November 2010, and continuing). In outline, these principles were

- presented to and approved by the North West Trauma Board in Nov. 2010
- presented and discussed with Overview and Scrutiny Committee members Nov.2010
- presented at the North West Trauma Conference Dec.2010
- continuing engagement with clinicians , managerial staff, patients and public

The following is a summary of each specialty’s workshop discussion. Each workshop was based on how to meet the specialty specifications set out in the National Clinical Advisory Groups’ report<sup>5,8</sup> of Sept 2010, using our proposed model.

**The list of “recommendations” for each workshop define the areas of agreement amongst workshop attendees. At this point in time, they are still open to challenge and modification.**

There is strong clinical support for raising the standards at Trauma Units higher than those published and adopted by East Midlands SHA<sup>6,7</sup>.

All three cardiothoracic centres met under the leadership of Prof Danny Keenan and have come to a consensus as to the ways in which they can best support the Trauma Programme. (appendix 8)

Dr Kate Pendry has led a parallel workstream reviewing the management of major haemorrhage and formulating regional recommendations. Her group has kindly developed guidelines for the management of major haemorrhage in trauma. These can be found at appendix 6.

The importance of rehabilitation to the whole system is emphasized by placing it first, in this report. Each specialty has further echoed the importance of this in their own discussion. The full paper presented to the Trauma Board is appended in appendix 7.

Otherwise, there is no inference of importance in the order of presentation.

### **Further actions**

A diagram of the clinical networks model for the North West can be found in appendix 2. This has been developed through collaborative work by clinicians. The ongoing development and refinement of the three network models needs continuing commitment and involvement of clinicians. Help and advice is both needed and welcomed, in order to identify gaps in our preparation so far, barriers to implementation, and constructive critique.

This report is aimed at clinicians in the North West who are already involved - for information and continuing discussion with colleagues in your own organisation, across your specialty, including Deanery and Royal College contacts. We need to build a sustainable solution, so training and educational requirements in the short and longer term need definition and understanding.

There remain a number of outstanding actions and decisions from the workshops which are needed to help the three networks in the North West decide exactly how to operationalize the principles agreed. In addition, we need to define meaningful metrics to accurately measure the effectiveness of change, and ensure that the quality of care is enhanced by our changes. Clinical governance, clinical audit and performance monitoring structures need to be established, both at North West Regional and network levels.

The timescale to implementation is short but implementation will of necessity be phased in over time, giving us the opportunity to engage in action learning together.

**This report is also an invitation to anyone else who would like to become involved in the design process. If you feel you can contribute please contact:**

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The North West plans will be subject to external review in early March 2011, so an early response will be helpful and assist with preparations for that.

**This report acknowledges with grateful thanks the time, enthusiasm, dedicated commitment and energy of all the senior clinicians who have contributed to both the preceding, and continuing debates, which have always centred on patients' needs, and who have had the courage to transcend traditional organisational boundaries and working practices. By continuing to work innovatively and together, we will improve the outcome for patients and their families, who suffer major trauma, in the North West.**

## Workshop: Rehabilitation Services

### Agreement

1. There was overwhelming agreement that rehabilitation is very high priority & poorly resourced in much of the North West
2. The model for early/acute rehabilitation was supported
3. Neuro-rehabilitation was felt to be the most complex, so requiring investment in much of the North West
4. We don't know what happens to patients requiring complex musculo-skeletal rehabilitation
5. Co-ordination of the rehabilitation pathway is crucial
6. We need to get on with it as soon as possible
7. Potential to explore 'integrated' rehabilitation services and possible centres of excellence with local re-ablement.

### Concerns

1. Current limited resources regionally and nationally
2. How to ensure that the workforce has appropriate skills
3. We have a neuro-rehabilitation model & patient pathway in Greater Manchester, **but** major bottlenecks due to lack of a collaborative approach to commissioning & managing the pathway
4. Uncertainty as to provision in the far north ie: in Cumbria
5. Services could potentially be overwhelmed, so how do we prioritise patients? Need to identify at an early stage those with potentially good outcomes
6. Uncertainty as to what constitutes a "Rehabilitation Prescription"
7. That rehabilitation may again be a "token gesture"
8. Poor access to vocational rehabilitation now and needs to improve

### Actions

1. Rehabilitation medicine consultants to become actively involved in planning of services relating to MTCs & TUs
2. Postgraduate Deans to look at the medical training implications

### Metrics

1. Not actually discussed, but we are not short of validated outcome measures in Rehabilitation Medicine. These are described in the UK Rehabilitation Outcomes project (UK ROC), in which most neurorehab units in the North West are participating

## Workshop: Neurosurgery, neuro-anaesthesia and neuro-radiology

### Agreement

1. There is agreement that neurosurgical access should be streamlined and quicker access is axiomatic to the function of each of the three networks.
2. Ideally all patients with traumatic brain injury or spinal cord injury should be managed in neurosurgical unit, irrespective of the need for surgery.
3. Access to whole body CT (as close to ED as possible) asap after arrival (max 30 mins).
4. Reports should be available immediately as complex patients should not be scanned without on site radiology cover. This could be at appropriate SpR level with either remote or on site Consultant support via teleradiology.
5. Teleradiology links should be available between all "TCs" and TUs.
6. Neurosurgical consultants are available 24/7 for consultation. Neurosurgical centres all have a senior trainee on site and a consultant is already available within 30 mins. A consultant is already involved in every decision to operate for traumatic brain injury.
7. Need a phased approach to introduction of "nearest hospital bypass" to get to neuro centre if less than 45 mins away.
  - Select those patients who will benefit most from n/s care
  - Address service capacity bottlenecks at
    - i. entrance to n/s service,
    - ii. step down from critical care
    - iii. discharge to rehab service
  - Patients who don't fit bypass criteria, ie need management of airway or major haemorrhage need to go to nearest TU.
8. Current delays in referral pathway to n/s are due to getting a decision to accept the patient, delay in referral due to delay in getting CT scan, and wait for an ambulance transfer. These could be resolved by implementing bypass or early transfer from a TU as appropriate. A list of conditions which EDs didn't have to ask permission to admit for (from TUs) would reduce time to n/s service.
9. Consultation with spinal centre from neurosurgery or TU should take place within 4hrs of patient admission
10. Cervical spine injuries may need ventilation due to breathing difficulty. Such patients will therefore need an ICU bed, not immediate transfer to a spinal unit. However, the Spinal unit still needs to provide early consultation so that optimal care can be provided and a planned transfer organised early on.
11. Centralisation of neuro rehab services across Manchester has worked well. This model is transferable? It would still need the enhanced development of community based rehabilitation teams to enable patients to progress through the system in a timely way.
12. **Quicker access to appropriate neuro rehabilitation services are fundamental to patient flow across the whole trauma network,**
  - in order to realise the benefits of improved and timely access to neurosurgical or spinal care. (This is time sensitive for maximum benefit).
  - To ensure patient flow continues across the network
13. There is insufficient neuro – rehabilitation capacity within the NHS leading to costly out of area and/or use of independent rehabilitation facilities/ treating avoidable complications and limited recovery leading to long term avoidable dependencies.

## Concerns

1. There is concern that free access from the prehospital environment, bypassing other units, could overwhelm neurosurgical services and result in other life-threatening injuries not being assessed appropriately. This is a particular concern in the knowledge of prehospital triage criteria overtriaging severe injury approximately threefold (London, Stoke and Nottingham experience). The latter could overwhelm (existing) resources at ED and neurosurgical services.
2. Better mortality outcomes if patients with severe head injury are treated at a neurosurgical centre, but the same benefit in *functional outcomes with increasing age* was questioned.
3. 24 hr MRI scanning only available in 1 location. Other services are 09-1700, Mon-Fri.
4. Immediate /rapid access to interventional radiology 24/7 would be very difficult /impossible at present without collaboration between units.
5. There are not sufficient rehabilitation opportunities available or funded to achieve improved patient flow at the present time. E.g. 50% acute beds at Walton NSU have rehabilitation needs which are not being met in a timely way, and stroke rehab takes precedence over trauma.
6. Rehabilitation services need to be enhanced in the community to allow discharge home.
7. Head injured patients need 3/12 of intensive neuro rehabilitation (unless they have post traumatic amnesia, when there is a greater need for specialist nursing skills for some months, before they can benefit from neuro rehab.)

## Outstanding Actions

1. There should be a network protocol for the assessment of the whole spine
2. Need to identify those patients who will benefit most from neurosurgical centre admission and ensure that they receive it. Identify patients below 55yrs who are harmed /don't receive maximum benefit from the current system from TARN data. (Maralyn Woodford to review)
3. A list of conditions which EDs didn't have to ask permission to admit for (from TUs) would reduce time to n/s service.
4. Identify realistic neurosurgical rehab service requirements to ensure that the benefit of an improved system actually works.

## Metrics agreed

1. A patient with isolated head injury should receive surgery (where appropriate) within 4 hrs of injury and 1 hr of arrival at the neurosurgical centre. Patients should be resuscitated to avoid hypoxia and hypotension (CAG)
2. Spinal imaging and assessment should be completed and reviewed by an appropriate consultant within 24hrs of admission (CAG)
3. At TU or neurosurgical centre- achieve intubation within 20 mins and CT within 30, with senior team leader supervising care.
4. Time to theatre from scene of injury
5. Time to theatre from arrival
6. Time to CT
7. Time to referral to spinal unit from arrival in ED

## Workshop: Critical care

### Agreement

1. Level 3 Critical Care needs to be on site in all Trauma Units as well as Major Trauma Centre collaborative hospitals. (CAG)
2. These level 3 facilities must:
  - i. Comply with National and Network standards as detailed in the North West Critical care commissioning framework
  - ii. Have dedicated consultant cover which meets the Intensive Care Society 2007 manpower standards
  - iii. Must participate in the activities of their respective critical care network.
3. Key co-dependencies for supporting services in patient care to be defined, and assume more importance in audit of TU/MTC hospital ITUs.
4. Level 3 services which support any element of specialist trauma care (vascular, orthopaedic, neurosurgical, interventional radiology, burns and general surgery) must satisfy the definition of a "high volume" site. This is one which admits in excess of 350 patients with acute lung injury and 180 patients with Adult Respiratory Distress Syndrome annually and is competent to treat patients with multiple organ failure. Such services must have a broad array of the supporting services on site, eg nephrology, cardiology, interventional radiology and general surgery. *(This has been challenged subsequently by email from several sources. Views please?)*
5. Patient transfers should be staffed from appropriately qualified TU staff involved with the patient and not wait for a regional transfer team. (CAG)
6. Transferring staff should be at least ST3 or above and should have completed a recognised transfer course (MOCC or STAR) prior to being allowed to transfer patients to another unit. Aim for consultant supervision of first transfer. (It is accepted that it would take some time to achieve sufficient training to make this possible.) (CAG)
7. All Critical care units belong to one of three constituted North West critical care Network and subscribe to a nationally recognised audit process. (CAG)
 

ICU standards measure

  - 24 consultant intensivist cover
  - ITU immediate management
  - ITU protocols
  - Daily consultant ward rounds
  - Audits
  - Earlier involvement in rehabilitation

The North West annual regional audit encompasses these standards.

8. Capacity: Each of the three networks should be self-sufficient, except in escalation, when a regional response is appropriate. There is a need to discuss the impact of the trauma programme with other networks that are further ahead than us.
9. All tertiary centres should act as one unit.
10. Paediatric critical care will be considered with paediatrics. However, TU based anaesthetic teams need to assume responsibility for transferring paediatric patients to specialist care, due to the urgent nature of the transfer.



11. ITU consultants, anaesthesia consultants and ED consultants could act as Unit trauma coordinators, once suitably trained.
12. Audit of trauma patient transfers (using ICBIS) should be shared widely, across the region's networks, (not just each local unit getting their own data) to enable shared learning. Every transfer form must be completed, and regular feedback provided.
13. Critical care staff (minimum ST3 or 4) are an essential part of the Trauma Team, which must also have consultant input.

### Concerns

1. There are gaps in nurse dependency across the region. Units are coded from the audit on a RAG system, but achieving amber and red status is sometimes due to "failing" on some of the less important criteria.  
However, In trauma centres, there should be a senior nurse available to coordinate trauma care, 24/7. This could be a supernumary band 7 nurse. It is part of the North West standards for level 3 care but is not achieved in some units.
2. Exit block reflected as "delayed discharges" from critical care is a major problem now. ICUs need clear help and guidance, by understanding who is responsible for ensuring "transfers out", "repatriation" and access to rehabilitation happens in a timely fashion.  
**There are not enough rehabilitation beds/services to allow for a successful system redesign at present.**
3. Need to ensure that the critical care bed base is not destabilised by the Trauma Programme. Trauma accounts for only 2% of all ITU cases but the median length of stay for a trauma patient is likely to be significantly longer than the average patient. Full implementation of hospital bypass and removal of work could potentially jeopardise the accreditation of units treating low patient numbers already, and thus impact on other services inadvertently.
4. There is standardised equipment for transfers in each network, but not across the region as a whole. There are significant educational needs to be met in order to achieve the standards agreed above, for staff undertaking patient transfers.

### Actions

1. Remodel annual regional audit to measure essential co-dependencies, and reflect trauma service standards. (action: Critical care network)
2. Use ICNARC data to get LOS on ITUs. (?Maralyn Woodford)
3. Review the impact of ST3 and 4 training needs on service provision (critical care network)
4. Review mechanics and feasibility of providing regular feedback from ICBIS data, and mechanism of coordinating shared learning. (critical care network)

### Metrics

1. Regional audit status annually – inform commissioners?
2. Number of ICBIS forms completed v. number of transfers, and data quality
3. Transfers undertaken meeting the defined standards of person qualification
4. Learning achieved and actions derived from analysis of ICBIS and ICNARC audits.

## Workshop: Vascular & Interventional Radiology workshop

### Agreement

1. A major trauma specialist at a MTC should lead initial patient resuscitation, and call vascular services in, as required, within a 30 min response time. Thus vascular services do not need to be co-located with neurosurgical services /major trauma service.
2. Consultant Vascular Surgical response within 30 mins is delivered to vascular units now, and could be also, to a major trauma service (MTC) - by moving the service / surgeon to the patient.
3. Although renal, splenic and pelvic injuries use interventional radiology more frequently than vascular injuries, IR and supporting radiology equipment is essential to a vascular service. *Thus availability of Interventional radiology equipment is a rate-limiting factor, if the surgeon moves to the patient.*
4. Interventional radiology services. need to be planned in both short and medium term, and factored into the vascular service response and regional service review
5. Immediate XR reporting is needed by a dedicated radiologist, who could cover a wide area through use of technology. Time standards needed would be reporting for plain films in 1 hour at TUs and MTCs and the same for CT at neurosurgical units and major trauma supporting hospitals. *Teleradiology links are essential. Any role for telemedicine?*
6. Ideally, there should be a dedicated multi-function operating theatre with fixed imaging equipment, in a major trauma centre collaborating hospital.
7. An experienced traumatologist is needed to act as triaging coordinator (24/7) to make robust clinical decisions for each individual patient's destination / priorities for care- on a network or regional basis, given that no hospital has all services on site.
8. Also need a coordinator for trauma patients in each MTC supporting hospital, to ensure there are no delays in patient care.
9. If surgeons move to the patient in a collaborative network, dedicated on call time is needed in their job plan. The system needs to work 24/7, the consultant will need to be free to respond, otherwise there will be greater difficulty responding during working hours. Will need rotas to be developed across the whole network.  
Successful networks operate already between Central and South Manchester, and Chester and Arrowse Park hospitals.
10. For hospitals without a vascular service, a minimum service specification should be drawn up, for when a vascular surgeon has to travel there to support patient care.
11. Vascular centres should practice autonomously, but not exclusively so in exceptional circumstances, they could share staff. (HR implications and job planning)
12. To achieve "vascular surgical" middle grade cover 24/7, the vascular rota will need to be augmented by general surgical trainees initially, as there are insufficient vascular trainees. It is likely that this will change over time.
13. CPD for trauma and team work could be arranged using existing simulation centres in the North West

## Concerns

1. No IR suite at Salford Hospitals. (one of the neurosurgical centres.)
2. There is a concern about the availability of interventional radiologists and whether 3 network rotas would be sustainable 24/7. Vascular surgical training includes some aspects of IR now, but this will not be available to support the service for 3-5years.
3. Job plans for IR and vascular surgery currently provide a 9-1700 regular elective service with on-call OOH. Thus significant changes would be required to job plans to ensure availability for emergencies during normal working hours.
4. Note that some patient travel times in Cumbria are 1.5 hours to a vascular service.

## Actions

1. Vascular surgeons are prepared to draw up a specification for the needs of a hospital without a vascular service, so that a patient can be managed safely (and transferred if necessary)  
(action Simon Hardy et al)

### 2. Metrics

1. Response time for vascular surgeons from call to patient :30 mins (CAG)
2. Reporting of plain XRs within 1hr at TU and MTC system, and reporting of CT within 1 hr at MTC system hospitals.

## Workshop: Spinal injuries (and neurosurgery)

### Background

- Current commissioned service includes Oswestry and Southport, but Oswestry can only provide a 09-1700 acute surgical service and are unable to manage a patient who needs ventilation.
- At a recent meeting with Welsh commissioners, agreement was reached to continue to use the North West for spinal service provision
- Average age of patient with a spinal injury is 45years, but the trend is getting older.
- In the past there has been differing opinions between neurosurgery and spinal surgeons re the need to operatively fix an unstable spine prior to transfer to a spinal unit.
- The proposed new system will see patients with spinal injury being transferred first to a centre with neurosurgical support.
- The spinal injury service needs assurance that physiologically unstable patients will not be transferred, ie with untreated significant non-spinal injury

### Agreement

1. **Recommendation : All patients with spinal injury (irrespective of associated trauma) should be discussed within 24hrs by neurosurgery, spinal services & ED to decide**
  - i. **If early transfer is appropriate**
  - ii. **If early reduction and decompression are needed**
  - iii. **If early fixation is required , and the extent of the same**
  - iv. **Clarify other injuries and /or comorbidities**

Patients who are disadvantaged now are those not being referred to spinal injury service early. Bony injury alone can wait overnight safely, provided immobilisation is adequate. Following the initial contact, the spinal injury service will follow the progress of the patient and maintain ownership for as long as required.

2. **Recommendation: The patient pathway used between Greater Manchester and Southport has helped streamline access to spinal services. It should be rolled out to the whole North West.**  
Outreach from spinal injury unit to include
  - i. Triage of admissions to spinal injury unit
  - ii. If trauma units become “additional capacity” for spinal cord trauma, and there are limited numbers of TUs, the Spinal Centre could provide “virtual ward rounds” via telemedicine links
  - iii. Education, especially to TUs
  - iv. Provision of advice re XRs . This will require all trusts involved in trauma care to operationalize enhanced PACS access for CT and MRI.
3. **Recommendation: There is a need for a regional (and national) strategy for operative intervention.**
4. **Recommendation: There is a need for a regional protocol for full spinal assessment (CAG)**  
This should include a management plan for ED and ITU to use for the unconscious, ventilated patient who can't be fully assessed. It should also address the needs of children.
5. **Recommendation: There is a need for a regional neurosciences review, to include specialist commissioning, ideally to start in Feb 11**

Workload –Walton NSU sees 20-30 patients pa, and Southport takes 2 new injuries per week, ie 100 patients pa. Common pathways for trauma will also benefit other patients with impaired neurology, eg cauda equina, central cord syndromes, tumours etc

#### **6. Recommendation: Improve access to spinal rehabilitation services**

It isn't appropriate to link head and spinal injury rehabilitation as each patient group has different needs. With respect to spinal injury:

- i. Spinal injury centres provide acute and life-long support. This is possible due to the small population who need it.
- ii. Intensive rehab for spinal injuries lasts 3-6mths, but if the patient has been ventilated, it lasts 6-9mths. Patients can then be picked up by local services in their own homes. ie 2 stages for rehab for spinal injury (cf 3 levels as recommended by CAG for head injury)
- iii. Major concern is how to access rehabilitation services from TUs
- iv. Outflow difficulties may be addressed by individual budgets
- v. Consider stipulating length of stay to improve throughput. Southport recently introduced an assessment at 4 weeks against rehab goals- it is a new culture for patients.
- vi. A coordinator is needed regionally for rehab services

#### **Concerns**

1. Role for orthopaedic spinal surgeon to operate on non-neurological injuries is no longer appropriate.
2. Major concern is how to access rehabilitation services from TUs.

#### **Actions**

1. There is a need for regional (and national) strategy for operative intervention. (Action Martin Wilby and Clive Glass)
2. Make a regional recommendation that orthopaedic surgeons should not operate on non-neurological injuries and monitor outcomes through TARN.
3. In devising a regional protocol for full spinal assessment, include a management plan for ED and ITU to use for the unconscious, ventilated patient who can't be fully assessed. It should also address the needs of children. (Action Martin Wilby and Clive Glass)
4. Role out of Greater Manchester spinal pathway across the region (Action CRG?)

#### **Metrics**

1. All spinal injured patients should be discussed with neurosurgery, ED or ITU and spinal injuries centre within 4-24hrs of admission.

## Workshop: Orthopaedics and Plastics

### Agreement

1. At a TU, a consultant should be available within 30mins, 24/7
2. The consultant responding to a TU would be expected to deal with all orthopaedic injuries, except
  - i. Pelvic and complex acetabular fractures
  - ii. Complex 3C tibial trauma (which needs plastic surgery input into operative care)
  - iii. Spinal fractures
3. A TU must be able to provide safe, damage control surgery (consultant led /delivered).  
Essential damage control techniques are
  - i. Application of an external fixator to the pelvis
  - ii. Adequate debridement and external fixator to a limb
  - iii. Wound management

However, a recent document about optimal fracture management recommended that treatment should not be given unless definitive care can be provided as well.

4. A region wide complex pelvic injury service could be available to give advice at the most basic level of service improvement, as well as provide support with training needs. Tony Clayson et al are frequently consulted for advice, which could be extended across the region. Support could be recruited for the on call rota from other organisations, with a system which uses telemedicine or enhanced PACS viewing.
5. Soft tissue hand injuries have separated out from orthopaedics and become “plastics” work, in some centres.
6. There are very significant advantages to reducing “time to surgery following injury” for hand, wrist, ankle fracture and neck of femur patients. These trauma victims are disadvantaged by long waits, often due to the need to meet other targets, eg cancer and 18 weeks.
7. Other disadvantaged patients include
  - i. Patients with more than 1 injury – eg head and limb fracture
  - ii. Trauma needing microvascular surgery
  - iii. Open tibial fractures which require input of orthopaedics and plastics simultaneously.
8. Improved access to theatre reduces problems with bed capacity. Eg, in one organisation, increasing from 1 to 2 trauma lists per day would save the capacity of a whole ward.
9. Telemedicine between Trauma centre systems and TUs would allow early consultation, advice, planning definitive care and virtual ward rounds.  
Telemedicine mediated skin clinics are run in South Manchester now.  
Giving advice regularly needs to be recognised in job planning. Appropriate tariffs would need to be negotiated on a regional basis or SLAs agreed.
10. Two centres run a complex brachial plexus injury service, but S Manchester will not be able to provide a resilient rota alone. It would be sensible to provide a regional service with a joint rota.

### Concerns

1. To comply with MTC standards, a consultant would be available, and free from routine commitments. However, there is increasing subspecialisation in orthopaedics. Many services operate a 09-1700, Mon-Fri service with on-call to cover OOH. This ensures that all subspecialty interests are available during the working day, but may reduce continuity of care on the trauma ward. Larger departments are experimenting with rotas which free up a consultant for up to a week at a time, to manage trauma patients operatively as required and on the trauma ward. This approach ensures continuity of care but limits subspecialty input into operative care. Both systems rely on on call OOH cover, with the same limitation of subspecialty input OOH. (CAG)
2. To comply with TU standards, an orthopaedic consultant should be available to respond within 30 mins, 24/7. (CAG)
3. Plastic surgeons currently travel to the patient to operate, as opposed to bringing the patient to them. There is a serious concern that they could become peripatetic surgeons. Definitive centres would make it easier to cover the rota, and less expensive. (?best for patients)
4. Are there any HR implications to giving advice remotely? Governance issues and lines of responsibility for the patient need to be clearly delineated.
5. Concerns were expressed about the lack of capacity in rehabilitation for orthopaedics and plastics -
  - i. Orthogeriatric input is very important
  - ii. Inpatient rehabilitation needs block bed capacity
  - iii. Weight bearing is a big issue for patients with bilateral injuries – patients are kept as inpatients just to get physiotherapy
  - iv. Rehab needs are intensive initially for plastics and orthopaedic patients, especially for pelvic injury, severe tibial injury (up to 6 weeks or more if complex injury), and flexor tendons.
  - v. Soft tissue rehabilitation only available at Salisbury, Wilts
  - vi. There is no non-neuro rehabilitation service for polytrauma patients in the North West
  - vii. Prof Lyn Turner Stokes at Northwick Park is running a national expert group to look at needs and costs of rehabilitation.
  - viii. Group estimate of beds needed was 8 for burns, 8 at RLUH and again in Manchester ie 24 altogether

### **Actions**

1. If TUs need to deliver damage control surgery as above, there will be an educational need to be met. Nigel Clay at Glan Clwyd hospital is setting up a course. North West should offer to help. (Action: Tony Clayson)
2. Ken Dunn to explore a joint rota between Whiston and S Manchester for complex brachial plexus injury
3. Look for research opportunities (which could also be potential income streams) eg
  - i. Pelvic injury database is process based (T.Clayson)
  - ii. Bluespier is an electronic patient record and database in one, which can be configured for local use. Eg all TUs could use it for data collection
  - iii. There is no available national plastics database, ie is there an opportunity?
4. Tony Clayson to find out who sits on the BOA expert group, and try to influence decisions towards best practice tariff areas.

## Metrics

1. Mortality measured through TARN
2. % return to previous employment
3. Length of stay
4. Total time in hospital
5. Surrogate markers, eg time from injury to definitive treatment. HES measures this but only to the nearest day, i.e. date of surgery
6. Defined standards of care exist for burns, tibial fractures and there is a national hip fracture database.
7. There is a national move to identify areas appropriate for “best practice tariff” payments.  
Potential areas could be
  - i. Management of pelvic injuries –life saving
  - ii. Management of 3C tibial fractures –limb saving
  - iii. Management of flexor tendon repair – functional loss



## Workshop: Prehospital care

### Agreement

1. North West Ambulance Service need clarity of their role in a new system, and detail of that system before they can plan how to manage their resources
2. There is an opportunity to utilise learning from the service changes associated with stroke and primary PCI service changes. Note that any additional resources funded would need a 6month lead in time for paramedic supported vehicles
3. Agreement to use the London Prehospital Triage Criteria. Because they are clinically based, there would be minimal educational requirements first.
4. From Jan 2011, there will be clinical support available in the control room and via RRVs. There are 36 band 7 paramedics across the North West who could be used to provide support to decision making using the Prehospital Triage criteria.
5. "Bypass" to an ED with neurosurgical support would be easier to implement in urban areas than from a rural area.
6. There would be less need for new resources if a patient could be taken to the nearest TU for CT head-to-pelvis, (effectively advanced triage for further specialist care). This would reduce the need for secondary transfer for all patients. Where it is required, total time to the "specialist centre" could be reduced by alerting NWS control on arrival at a TU that onward transfer is likely to be needed. This would help NWS with tasking.
7. A Patient with a head injury and compromised airway or who is critically unstable due to major haemorrhage must be taken to the nearest TU for airway management and appropriate resuscitation. A TU must have the ability to perform damage control surgery as part of haemorrhage control.
8. Until rehabilitation services improve or are more widely available, a second layer of transport is needed to decant patients back to local care in a timely way. This is vital for preserving patient flow through specialist centres.
9. TARN has provided a workload analysis by individual Trust and area of body injured which should help NWS capacity modelling. However, this can't be completed until there is more detail around the number and geographical distribution of TUs in the North West.
10. Coordination is needed at several levels
  - i. Local trauma coordinator in TUs and "MTC system" . This does not necessarily need to be medical.
  - ii. Network coordinator –could be member of MERIT team. Central funding awaited for development of these posts.
  - iii. Regional coordinator needed, especially if bypass is introduced, to guide and follow patients through the services available

### Concern

1. Concern was expressed about the impact of a reduction in trauma units together with hospital bypass, and how that would affect service delivery targets due to increased travelling times.
2. Concern similarly was expressed about the impact of over-triage (3:1), using the existing version of London Triage criteria, on normal service delivery.
3. Paramedic confidence in their decision making and distance from a TU or MTC system hospital will affect how well the triage criteria are adhered to.

4. Significant concerns were expressed about the journey times (due to geography) for injured patients in Cumbria, eg 1.5 hrs to Carlisle, and the consequent need for each of the hospitals to function as TUs. Geographical distribution of TUs will be as important as achieving the “kitemark” standards.
5. Standardisation of documentation (PRF) would be ideal. It is electronic in Lancs, and easy to audit. Elsewhere it is more difficult because documentation is paper based.

## **Thoracic Trauma Management ( from D. Keenen's paper describing the 3 centres' discussions)**

### **Agreement**

1. Wythenshawe, MRI and Blackpool Victoria are all prepared to cooperate in any new systems designed to improve the management of patients with chest trauma
2. The concept of direct transportation of an open injury by the ambulance service to the on-call unit (for Manchester) or to Blackpool (if in their catchments) with direct contact to the cardiothoracic surgeon, with the possibility of using the A&E department in the respective hospital (i.e. MRI, Wythenshawe and Blackpool) was accepted with the proviso that the transfer time was not excessive (to be defined)(particularly important for Blackpool)
3. With open trauma to patients outside of certain boundaries (to be defined but taking into consideration transfer time, time of day and decompensation when picked up), transfer to local DGH with immediate thoracotomy by general surgeon with packing of bleeding wound and transfer on to cardiothoracic theatre
4. There is the possibility of a cardiothoracic surgeon travelling to the patient. The logistics of cover at the base hospital were felt not to be insurmountable. It will be difficult to develop an algorithm as to where this would fit into the overall management strategy
5. The basic concept of supporting patients with closed injuries who might be moved to neuro centres was accepted
6. It was felt that there should be more communication about such patient than is currently the case. Many of these patients would benefit from expertise re tube placement and surgery to deal with bleeding and haemothorax. Such patient are generally more semi urgent and there would be ample opportunity for imaging and transfer of such images
7. The movement of images was believed not to be an important issue. Indeed several colleagues in Blackpool have facilities to view images at home. Never the less it was believed that with open trauma imaging was not a major consideration.
8. Not discussed was how to have direct contact to the on-call consultant although this was agreed as important. The different units will organise rotas, in line with current arrangements, and these can be publicised in line with the overall strategy.

### **Concerns**

1. There were questions about the size of the actual problem
2. There was a desire not to act as a filtering service so that any patients brought straight to the cardiothoracic unit would have a life threatening injury

### **Actions**

1. There are very important geographical considerations which will need to be discussed with the ambulance service and general surgeons who are located at a distance for the local cardiothoracic centre
2. Additional training will be provided to the general surgeons outside of such boundaries. It is considered that surgery to deal with open chest trauma is complex and stopping of bleeding and packing with modern haemostats is best.
3. Additional training might be required for several cardiac surgeons who will be on such trauma rotations

## Workshop: Paediatrics

### Agreement

1. Severe injury in children is fortunately very rare. 250 children per annum nationally are considered to have severe injury, so approximately 25-30 patients per annum across the vast geography of the North West. It might be expedient to lower the bar in terms of severity in order to make a trauma service relevant and cost effective.
2. Two centres in the North West have all services on a single site (Manchester and Liverpool), so we do not need to adopt the same approach as London (all adult hospitals must be able to manage paediatrics). However, a “staging post” for paediatrics will be needed in the north of the region (Preston)
3. In the event of severe trauma affecting members of the same family, it was agreed that the need to deliver best care to each patient over-rode a desire to “keep a family together” at a single destination.
4. In resuscitation terms, there is an understanding that a child aged >8yrs can be treated as an adult, and in an adult unit.
5. Paediatric units would want to treat from the outset all children <5yrs if possible, utilising bypass of TUs if the journey time is <45 mins, and there are no immediate concerns about the airway or major haemorrhage, as secondary transfer causes delays.
6. Requirements of a TU
  - i. To manage a paediatric airway
  - ii. To establish vascular or intra-osseous access
  - iii. To provide a transfer team to a Paediatric MTC
  - iv. **NOT to start investigating with CT etc**
7. As not all TUs may have a paediatric department on site, consider an additional kitemark standard which acknowledges accreditation to manage paediatric initially, ie a TUP (Paediatrics)\*\*\*
8. Paediatric surgeons would wish to manage blunt and penetrating trauma in children, as the evidence base favours a more non-operative approach than in adults. Thus transfer to a paediatric centre could prevent unnecessary laparotomy and organ loss. Furthermore, interventional radiology is being used to provide minimally invasive procedures to arrest major haemorrhage in severe trauma.
9. A paediatric retrieval service is not appropriate for injury, only for illness. It would not be cost effective for such small numbers over such a wide area either.  
Thus the TU or TUP would need to provide staff for a transfer.
10. Rehabilitation:
  - i. We must include mental health issues and the impact on families caused by trauma. Andrew Curran is a rehabilitation lead at Alder Hey Hospital.
  - ii. Families could be brought together at the rehabilitation stage
  - iii. Access to good rehabilitation is essential for recovery and ongoing development.

## Concerns

1. There is no definition of major trauma in children and the altered physiology seen in children makes scoring systems underestimate severity. However, a tendency to overtriage severity is safer.
2. There are no paediatric equivalent to adult trauma surgeons.
3. When to transfer children treated initially in an adult unit?
4. Prehospital paramedic training is currently based on having to manage the first 40 mins of care. Hospital bypass would have service and commissioning implications if greater travel times and duration of care of care is needed.
5. Paramedics will not be trained to perform rapid sequence induction of anaesthesia for airway management in the foreseeable future.

## Actions

1. The potential role for the NWTS team (North West Transport Service) was discussed, as it is region wide, has 24/7 consultant availability, and is a single point of contact. Suggestions included
  - i. An early pre-hospital call to NWTS, who could pre-alert the most appropriate destination. The availability of critical care beds is critical in determining the most appropriate definitive destination. NWTS would be aware of this.
  - ii. Could the NWTS team meet the patient at a TU or TUP,
  - iii. Anything else? The service is not commissioned to manage trauma currently.
2. A review of paediatric neurosurgical services is under way "Safe and sustainable neurosurgery" which is reviewing options for the service, including uniting the 2 neuro sites. A decision is expected in 2013.  
Preston neurosurgeons currently undertake only life-saving neurosurgical interventions in children and feel that there is a need for this to continue.

## Metrics

1. Time of injury to surgery is important as it directly affects outcome.
2. Adult outcome is % return to work. Paediatric equivalent is return to school, or appropriate stage of development?

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<http://www.library.nhs.uk/Emergency/ViewResource.aspx?resID=345713>

**Useful resource: a regularly updated collection of trauma related guidance and reports**

NHS Evidence / Urgent and Emergency care / organisation of Trauma services

<http://www.library.nhs.uk/Emergency/ViewResource.aspx?resID=345713>