Witness Name: Bimal Mehta

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THE SOUTHPORT INQUIRY

Exhibit BM/02 – North West Children's Major Trauma Network Report

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REVIEW OF CLINICAL RESPONSE TO SOUTHPORT MAJOR INCIDENT 29 JULY 2024: OUTLINE OF RECOMMENDATIONS AND OPPORTUNITIES FOR SHARED LEARNING

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Organisation	Cheshire & Mersey Major Trauma Operational Delivery Network (C&M MTN) North West Children's Major Trauma Operational Delivery Network (NWChMTN)
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Clinical Leads of Major Trauma Networks	John Matthews – Emergency Medicine, Whiston Hospital, Mersey and East Lancs NHS Trust David Wilson- Consultant Emergency Medicine, Countess of Chester Hospital Naomi Davis - Consultant Paediatric Orthopaedic Surgeon Royal Manchester Children's Hospital Bimal Mehta - Consultant in Paediatric Emergency Medicine Alder Hey Children's Hospital
Authors	Helen Blakesley - Network Manager NWChMTN Kelly McCarty-Lead Nurse NWChMTN Julie Peacock – Network Director C&M MTN Calum Edge – Quality Improvement Lead C&M MTN David Wilson- Consultant Emergency Medicine, Countess of Chester Hospital Naomi Davis - Consultant Paediatric Orthopaedic Surgeon Royal Manchester Children's Hospital Bimal Mehta - Consultant in Paediatric Emergency Medicine Alder Hey Children's Hospital
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Point of Contact	Helen.blakesley@mft.nhs.uk

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1.0 Introduction

Following the Major Incident that took place in Southport on the 29th of July 2024 the Cheshire and Mersey Major Trauma Network (CMMTN) and the North West Children's Major Trauma Network (NWChMTN) were requested by the National Director for NHS Resilience to lead and coordinate a review of the clinical response to the incident.

Both networks have established governance process and regularly facilitate case reviews at an individual patient basis as part of the networks commitment to learning from incidents or excellence. While this incident was on a larger scale, the clinical review process followed the standard Networks processes as highlighted in the Networks Terms of Reference (see appendix 1).

The effectiveness of the wider emergency preparedness, resilience and response at both organisation and system level was out of scope of this clinical review, with the evaluation of this aspect of the incident response being undertaken by NHS Resilience teams.

In accordance with NHS Code of Practice regarding confidentiality, and as to not influence or compromise any coronial, judicial, or other statutory reviews being undertaken concurrently or in the future, the content within this first report will remain anonymised with key findings and outcomes being aggregated to facilitate the sharing of recommendations and opportunities for learning with stakeholders at both a local and national level at the earliest opportunity.

2.0 Process

2.1 Case Identification and Dispersal

As part of the initial network response to the major incident, and prior to the formal request to undertake the clinical review, CMMTN and NWChMTN had worked collaboratively to ensure that there was oversight of the status and location of all thirteen cases involved in the incident, thus gaining understanding of where each patient had been transported to across the region.

This identified the pre-hospital services and NHS Trusts that would be required to partake in the review process, as listed below:

Pre-Hospital Services:
Great North Air Ambulance Service (GNAS) North West Ambulance Service (NWAS) North West Air Ambulance Service (NWAA) West Midlands Air Ambulance Service (WMAAS)
NHS Trusts
Liverpool University Foundation Hospital Trust – Aintree Adult Reginal Major Trauma Centre **Alder Hey Children's Hospital NHS Foundation Trust** – Children's Regional Major Trauma Centre **Manchester University NHS Foundation Trust** • Royal Manchester Children's Hospital – Children's Regional Major Trauma Centre **Mersey and West Lancashire Teaching Hospital NHS Trust** • Ormskirk Hospital District General Hospital • Southport & Formby District General Hospital Trauma Unit

2.2 Review Proforma

The network teams worked collaboratively to adapt a Major Incident: Network Rapid Review Form (see appendix 2) previously developed by CMMTN, expanding the content to facilitate the capture of the full chronology of the clinical management of each case which included data fields for:

- Pre-Hospital Prioritisation
- Pre-Hospital Chronology
- Level of attending Pre-Hospital Clinician
- Key on-scene timings
- Emergency Department Management
- Emergency Department Immediate Interventions
- Emergency Department Chronology
- Emergency Department: External Specialty Assistance Required
- Injuries Sustained
- Destination from Emergency Department
- Theatre Interventions
- Critical Care/ Ward Interventions
- Inpatient Rehabilitation Interventions
- Discharge Destination
- Follow Up / Community Rehabilitation
- Any Identified Issues.
- Any Immediate Actions Implemented Since Incident
- Outcome

2.3 Collection of Clinical Information

To ensure appropriate organisational oversight along with timely submission**,** the review forms were shared via the Medical Directors and Trauma Leads at each organisation who responded to the incident. Organisations were requested to provide detail of specific aspects of clinical assessment, intervention and management for each case presentation.

Supporting information was provided with the forms, outlining the purpose and proposed outputs of the exercise, and due to the sensitivities surrounding this process this also included the following statement:

Any review is potentially subject to disclosure where a criminal investigation, public inquiry or inquest takes place or where the Freedom of information act (FOI) applies. Given the nature of the subject matter there may be specific details you are not in a position to disclose, this should not prevent you from participating in this review process as long as you do not breach any relevant acts or non-disclosure agreements. If you are unsure as to what can be disclosed, please seek advice from your Caldicott Guardian or legal team.

On receipt of completed forms the network teams aggregated all the information pertaining to each individual patient to form a sole case review document that provided a full chronology detailing clinical management from pre-hospital through to discharge and follow up.

2.4 Review Meeting

The clinical review meeting hosted by Alder Hey Children's Hospital took place on the 29th of August 2024 and was chaired by the National Director for NHSE Resilience.

Attendance comprised of senior leadership representatives from the organisations and services directly involved in the incident along with a cross section of regional and national system leaders and senior clinicians with expertise in the management of paediatrics and/or major trauma care (See appendix 3).

The review meeting followed a structured format. The opening session included introductions and an outline of the purpose for the meeting. This was followed by a brief overview of the Pre-Hospital response, which provided detail on allocation of resources, initial triage process and casualty dispersal decisions.

Each individual case chronology was presented by a network team member, followed by a clinical discussion facilitated by a senior Medical Lead from across the region. The purpose of the discussion was to determine clinical consensus regarding:

- areas of best practice
- compliance with the major trauma pathway
- opportunities for learning and informing future service provision and development.

Network team members captured these key points in real time during the discussions.

The day concluded with a final session delivered by one the network team who provided an overview summary of discussions and actions from the day, to ensure that all opinions and feedback had been captured.

3.0 Opportunities for Shared Learning and Informing Future Practice

3.1 Case Reviews

Following the review meeting both the CMMTN and NWChMTN have worked collaboratively to ensure that all discussions and outputs from the review meeting were recorded and aligned to the relevant case. The output from this process will ensure that for all thirteen cases there is a standardised overview of the chronology of care and clinical management, plus a summary of the findings identified through the review process. Due to the ongoing sensitive nature of the incident and as not to compromise parallel coronial and legal processes, detail regarding case specific information at this

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stage will remain restricted, only to be shared at with the approval of NHS England Resilience Director or as directed by the Coroner's Officer.

3.2 Case Aggregation

To minimise any delays in ensuring opportunities for recognising best practice and sharing potential learning the following section of this report has been developed by aggregating the information from all the cases collectively.

To ensure that this subsequently then translates in to defined actions this information will be themed and where appropriate assigned to a specific organisation, network, or system.

4.0 Clinical Review Meeting Learning and Actions

4.1 Major Incident Actions

4.1.1 Major Incident Communication

While previously highlighted as being out of scope of the clinical review meeting, attendees referenced that communication regarding Major Incident stand-by, declaration, and stand-down processes, appeared suboptimal and had the potential to impact on direct clinical care.

It was reported that there was a lack of formal notification to organisations either directly required or potentially required to respond to the incident.

A Hospital Advice and Liaison Officer (HALO) was deployed to one of the Children's Major Trauma Centres, however this was not replicated in other receiving organisations.

A review of the Major Incident alerting processes should take place from a regional ICB EPRR and Ambulance Service perspective.

4.1.2 Major Trauma Divert

The clinical review meeting highlighted the decision-making processes by pre-hospital teams which involved conveying one child to the nearest Adult Major Trauma Centre (MTC) and one child to the next available Children's MTC. It is understood that this decision was made as the nearest Children's MTC was reaching capacity due to the number P1 cases arriving I quick succession. It was noted that Major Trauma patients unrelated to the Major Incident continued to be directly conveyed to the main receiving Children's MTC.

Discussion took place regarding diverting Major Trauma cases from a Major Trauma Centre that is the main receiving site during a Major Incident. Consideration should be given on a case-by-case basis as to the most appropriate destination for these patients whilst considering level of need, geography, and available resource.

Fig 1. Major Incident Information Cascade

No	Action	Action Owners
4.1.1	A review of major incident alerts and cascading of communication should be performed by prehospital services and regional ICB EPRR teams. Prehospital services to review the use of HALO's during a MI response.	Prehospital Services / Regional ICB EPRR Teams
4.1.2	Existing pre-hospital divert, and deflection policy should be reviewed specifically relating to peadiatric major trauma, to determine processes for patients were there may already be potential for extended travel times and to consider conveyance to the next available Children's Major Trauma Centre during a major incident, where it is clinically and logistically feasible to do so.	Prehospital Services / Regional ICB EPRR Teams /MTCs

4.2 Pre-Hospital Setting

4.2.1 Zero Responders - Use of chest seals for penetrating trauma

Chest seals are a specialised adhesive dressing used to treat penetrating chest injuries, such as gunshot wounds, stab wounds, and other chest trauma. The chest seal is designed to create a one-way seal over the wound, preventing air from entering the chest cavity and causing a potentially life-threatening condition known as tension pneumothorax. In the UK chest seals are widely available in the prehospital setting and are key piece of equipment in first responder kit bags for both healthcare professionals and non-medically trained zero responders, such as Police Officers, who receive training on the use and application for penetrating trauma.

The use of Chest Seals was discussed in the review meeting and there was a request for clarity of clinical indication and use by zero responders and prehospital services to be reviewed nationally as variation in practice was noted.

4.2.2 Major Incident Triage - Ten Second Triage and Major Incident Triage Tool

The Ten Second Triage (TST) tool became available from April 2023 with full implementation and replacement of previous triage methodologies across the NHS by 30th of June 2024. It has been designed to be quick, simple, and effective at prioritising large numbers of casualties rapidly, with a focus on immediately providing lifesaving interventions (LSI). These LSI include control of severe bleeding and opening of the airway, which are known to be the key requirements to maximise patient survival in the initial stages of injury.

The simplicity of the tool minimises cognitive burden and frees up bandwidth to assist responders to treat casualties in what can be particularly challenging circumstances.

There are no physiological parameters; breathing and pulse rate are not measured, allowing the tool to be used by those responders with little or no clinical training. In addition, the tool does not triage casualties as dead but labels as not breathing, allowing for appropriate interventions, such as recovery position or CPR, depending on the circumstances until formal triage by a registered healthcare professional takes place. 10 Second Triage Tool (england.nhs.uk)

Once sufficient clinical resources are present, a physiological clinical triage should be undertaken as soon as possible. The NHS Major Incident Triage Tool (MITT) has been designed to be used by clinicians as a comprehensive, reliable and reproducible algorithm for the triage of patients. It was formally introduced in June 2024. The MITT has an increased sensitivity and accuracy for identifying f high acuity patients compared to other triage tools. It is applicable for both adult and paediatric patients, with the addition of rescue breaths for paediatrics and the automatic categorisation of those under two years as priority one. MIT (england.nhs.uk)

It was acknowledged that this was the first major incident of this kind that utilised both these new triage tools. Due to the type of incident (multiple patients with penetrating injuries) most patients were categorised as P1 due to either the location of their penetrating trauma or the bystander interventions applied (tourniquets). This made on scene management difficult in terms of directing assets to the most appropriate patient.

It was recommended that there should be a review of MITT and TST in cases involving penetrating trauma in relation to:
Prioritisation for interventions i.e., blood products
Use in penetrating trauma due to all patients being categorised as P1's, including those with zero responder application of tourniquet.

4.2.3 Use of Triage Markers at the Major Incident Scene

Once triage has been performed, and a category allocated, all patients should be provided with a visual indication of their prioritisation category. At the review it was evident that prehospital triage patient markers were not routinely used, this caused some duplication in patient assessments by prehospital services. Best practice would be for all patients to have an appropriate triage marker applied during a major incident.

Prehospital services should review their triage processes for identification and prioritisation patient markings for major incidents.

4.2.4 Use of Prehospital Triage to Inform Prioritisation and Allocation of Prehospital Resources

It was acknowledged in the review that in this instance, the TST and MITT limited prehospital providers ability to prioritise interventions and prehospital critical care services, as all patients were identified as P1 patients.

It is recommended that there be a national review of the MITT to review how prioritisation of clinical interventions and enhanced pre-hospital care team distribution can take place during a major incident.

4.3 Major Incident Scene Management

4.3.1 Scene Control

It was noted at the review that some of the children were picked up and moved by bystanders and members of the public. This added additional challenge to responders with regards to scene control

and management, as the dispersal of patients was over a larger than expected area. This, along with the nature of the incident faced by responders impacted the dynamics of the scene. It was acknowledged that scene clearance was lengthier than would be anticipated for the number of patients.

A review of the triaging at scene and clearing of the site was recommended by the clinical review team, and any learning points be fed back as part of the review process.

4.3.2 Airwaves Major Incident Channel Communication

Out of region prehospital mutual aid responders were unable to access the Airwave Major Incident Channel on the day. Access to this channel should be reviewed by the National EPRR Team.

4.3.3 Communication between Complex Incident Hub and on Scene Command

It was noted in the review that the clinician in command on scene was not made aware of when Consultant led Helicopter Emergency Medical Services (HEMS) would be arriving on site. HEMS Consultant led teams can provide on scene prehospital transfusion and advanced surgical skills and diagnostics, prior to transfer to hospital. Consideration was given to whether there could be benefit for patients remaining on scene awaiting the arrival of the HEMS Consultant led teams for enhanced prehospital care procedures to take place in similar situations. It was acknowledged that patients on scene were in a time critical condition and that the crews followed agreed major trauma pathways by conveyance to the nearest designated Trauma Unit (TU) for ongoing resuscitation and stabilisation, the nearest TU was 5 minutes from the scene of the incident.

It was evident in the review that the treating clinicians at the scene were unaware when the HEMS consultant teams were due to arrive onsite.

The review recommended that the prehospital service review communication between the Complex Incident Hub and clinician in command at scene regarding allocation and arrival time of assets on scene.

4.3.4 First Responder Video Footage

It was acknowledged that a number of prehospital responders wear video cameras. The footage from these cameras is used to safeguard prehospital personnel against violence and aggression. It was asked if this footage could be used for learning around Major Incident scene management.

Legal and national advice would need to be sought regarding the sharing of body worn camera footage outside of the intended scope.

4.4 Casualty Distribution During Major Incident

4.4.1 Major Incidents not Meeting Mass Casualty Threshold

The incident in Southport did not meet the definition of a Mass Casualty incident, and as such all but one of the patients were treated within the Cheshire & Mersey Network region, with one patient being

conveyed to the next available paediatric MTC in Greater Manchester Network. However, in any future event involving children, acknowledging the reduced availability of Children's Major Trauma Centres (MTC) compared to Adult MTCs, there may be potential need for casualty dispersal across the North West region, or wider, had there been more injured patients. As such, there was a request for a review to take place regarding the threshold for conveying patients cross-network boundaries, when mass casualty threshold isn't reached in special circumstances such as multiple injured children.

4.4.2 Major Incident/Mass Casualty Distribution Matrix.

NW NHSE EPRR have been requested to review the regional mass casualty distribution matrix to ensure it reflects current clinical capacity, provision and capabilities across all organisations within the Major Trauma System

4.4.3 Patient Distribution and Hospital Trauma Capabilities

One patient was taken to a Local Emergency Hospital (LEH) direct from the major incident scene. The pathway for a patient with limb threatening injuries outside of a major incident would be for the patients to be taken direct to a children's MTC. The LEHs are not recognised as a designated TUs and as such, do not routinely have clinicians and services onsite to manage paediatric major trauma.

Exploration of the distribution of patients during a major incident should take place to ensure that patients are transferred to units which are able to manage the clinical needs the patient and family.

4.4.4 Children Over the Age of 12 Years Old

Patients over the age of 12 years were taken to a standalone adult MTC. In a mass casualty / major incident, it is recommended that children over the age of 12 years old can be managed in adult centres. It was noted in the review that the adult MTC admitting paediatric patients did not have the appropriate size chest drain and access to paediatric guidelines, discussions were raised as to whether age or size should be the determining factor of decision to transfer to an adult major trauma centre.

It was discussed in the review that age should continue to be a determining quantitative factor in the distribution of patients in a major incident as much as can be surmised at the scene.

All adult standalone trauma units and MTCs should ensure that they have smaller sized equipment e.g., chest drains available for young people and small adults.

4.4.5 Keeping Families Together

It was noted in the case review process that siblings were separated and taken to different MTC sites. This had impact for ongoing care and consent for the child who not transferred with the parent.

The review recommends that prehospital services consider keeping families together, when possible, for the patients ongoing care as part of the major incident distribution plan.

4.5 Enhanced Pre-hospital Care Teams

Across the HEMS resources attending the major incident scene it was highlighted that there were differing clinical capabilities on board, this makes it difficult for onsite coordination. Reviewers asked if clinical capabilities of HEMS crews should be standardised nationally.

4.6 Prehospital Child Traumatic Deaths

4.6.1 Formal Confirmation of Death

It was acknowledged as part of the review that there appeared to be a delay in the formal confirmation of death for patients not conveyed to hospital. During the clinical review there was confusion regarding the definitions of informal and formal identification of death and the impact of this on subsequent statutory procedures such as Sudden Unexpected Death in Children pathways.

The review recommended that clarification of the formal confirmation of death process be sought during major incidents.

4.6.2 Support of bereaved families following the traumatic death of a child

Following the death of a child in the prehospital setting, normal process is to convey the child to hospital for ongoing family support and for the sudden unexpected death processes to be commenced. In the major incident the children who had their death diagnosed on scene did not follow these expected processes. It was acknowledged as this was a major incident normal processes would be difficult to follow due to the number of children requiring transfer to hospital and resources were limited.

Clarification has been sought from police in attendance at the review who advised that their normal process was for any deceased patients to remain on scene.

As part of the learning from this review the process around child death in the prehospital setting during a major incident should be reviewed to ensure the family receives the same level of bereavement support and sudden unexpected death processes are commenced.

4.7 Administration of analgesia to paediatric patients

Despite significant injuries, many of the paediatric patients did not receive appropriate prehospital analgesia. It was reported in some cases that analgesia was considered, but not administered as the patient reported no pain. In the case review notes from prehospital services, it was noted that there are opportunities for learning in terms of provision of analgesia in paediatric patients.

Fig 2 Pre-Hospital Action Table

No	Action	Action Owners
4.2.1	Review use of chest seals by zero responders	National who?

4.2.2	Review of MITT and TST in penetrating trauma regarding: i. Prioritisation for interventions i.e., blood products ii. Use in penetrating trauma due to all patients being assessed as P1's including those with bystander or zero responder application of tourniquet	Prehospital Services / National who?
4.2.3	For prehospital services to review triage process for identification and prioritisation patient markings for major incidents.	Prehospital Services
4.2.4	It is recommended that there be a national review of the MITT to review how prioritisation of clinical interventions and critical care team distribution can take place during a major incident.	National Who?
4.3.1	A review of the triaging at scene and clearing of the site has been recommended by the reviewers and any learning points be fed back as part of the review process.	Prehospital Services
4.3.2	Review access to Airwaves Major Incident Channel for out of region mutual aid responders	National EPRR team
4.3.3	It is recommended that the prehospital service review communication between the Complex Incident Hub and clinician in command at scene regarding allocation and arrival time of assets on scene.	Prehospital Services
4.3.4	To look at addressing use of video footage from prehospital teams and utilising this for major incident scene management.	National who?
4.4.1	Review regarding the threshold for moving patients around region when mass casualty threshold is not reached in special circumstances.	Regional NHSE EPRR Leads
4.4.2	NW NHSE EPRR have been requested to review the regional mass casualty distribution matrix to ensure it reflects current clinical capacity, provision, and capabilities in units.	Regional NHSE EPRR Leads
4.4.3	Exploration of the distribution of patients during a major incident should take place to ensure that patients are transferred to units which are able to manage the clinical needs the patient and family.	Regional NHSE EPRR Leads
4.4.4	All adult standalone trauma units and MTCs should ensure that they have smaller sized equipment e.g., chest drains available for young people and small adults.	Standalone Adult MTCs / MTUs
4.4.5	The review recommends that prehospital services consider keeping families together, when possible, for the patients ongoing care as part of the major incident distribution plan.	Prehospital Services
4.5	Should clinical capabilities of HEMS crews be standardised? This should be reviewed nationally.	National who?
4.6.1	The review recommended that the clarification of the formal confirmation of death process be sought during major incidents.	National who?

4.6.2	i. As part of the learning from this review the process around child death in the prehospital setting during a major incident should be reviewed to ensure the family receives the same level of bereavement support and sudden unexpected death processes are commenced. ii. Further clarification needs to be sought around appropriate processes for traumatic child deaths and police investigations to ensure that any learning /new processes include children who are unable to be conveyed to hospital as part of criminal investigations.	National who?
4.7	Review and learning of paediatric analgesia administration in the prehospital setting.	Prehospital Service

4.8 Blood Products

4.8.1 National Blood Product Availability

An amber alert from NHSE Blood and Transplant Service was issued on Thursday 25th of July 2024 regarding a national shortage of blood products, specifically relating to group O red cells.

It was asked in the review meeting if this shortage impacted blood product availability during the major incident. The Network will liaise with the regional NHSE Blood and Transplant Service to enquire about this.

4.8.2 Major Incident Declaration and Blood Transfusion Services

It was reported there was a delay in platelet provision to an Emergency Department due to the ongoing major incident across the region and products potentially being diverted to other organisations. The importance of defining the actions to be taken during major incident stand-by and full declaration need to be clarified, specifically relating to availability of blood products to ensure that additional blood product stocks are provided to the correct organisations, reduce unnecessary delays or potential wastage.

Fig 3. NHSE Blood and Transplant Service Action Table

No	Action	Action Owners
4.8.1	Network to link in with NHS blood and transplant service to enquire if national blood shortage impacted on blood product availability during the major incident.	MT Networks
4.8.2	Defining actions to be taken during major incident stand-by and full declaration need to be clarified, specifically relating to availability of blood products to ensure that additional blood product stocks are provided to the correct organisations.	MTC & TU EPRR NHSEBTS

4.9 Blood Borne Virus Screens and Immunisations

All patients admitted to a MTC or TU during the major incident with a penetrating injury underwent blood borne virus screening and an immunisation regime. This wasn't the case for patients admitted to a Local Emergency Hospital who were discharged without this process; however, on communication to the paediatric MTC this was identified, and screening and immunisation commenced.

All hospitals should have in place a local guideline for the screening of blood borne viruses and immunisations in the case of penetrating injury and mass casualty events where there is a risk of exposure.

Fig 4. Blood borne virus screens and immunisations actions.

No	Action	Action Owners
4.9	All hospitals should have in place a local guideline for the screening of blood borne viruses and immunisations in the case of penetrating injury and mass casualty events where there is a risk of exposure.	Hospital trusts

4.10 Reception and Resuscitation

4.10.1 Care of the Child in an Adult MTC

During the major incident children over the age of 12 years old were transferred to an adult MTC with no paediatric services onsite. The adult unit are not members of the NW Children's Major Trauma or Paediatric Critical Care Networks, and therefore have not previously had e access to the regional network paediatric guidelines including radiology protocols and training resources. The adult MTC identified issues around:

- Appropriately sized equipment for paediatric patients i.e. chest drains
- CT protocols
- Uses of blood warmers in paediatrics
- Paediatric drug dosages
- Consent processes

Reviewers recommend that all adult stand-alone Major Trauma Centres and Trauma Units should ensure that they should have appropriately sized equipment including chest drains available for young people.
Stand-alone adult MTC's and TU's need to ensure that they have access to paediatric trauma guidelines and resources to ensure they can meet the needs of young people during a mass casualty/major incident.

4.10.2 CT Scanning Capabilities

During the review process it was noted that in some cases, time to CT scanning was longer than expected; however, clinicians at the review concluded that any delay in CT scanning did not negatively

impact the patients care or outcome. It was highlighted that there were processes in place to ensure that delays to CT scanning were minimised during the incident, with radiology teams coordinating patient flow through the department. It should be noted that the main receiving stand-alone Children's Major Trauma Centre has a sole CT scanner for the entire organisation which has previously been identified as a risk and has resulted in implementation of Business Continuity Plans (BCP) during periods of unexpected or planned downtime.

As part of the review, discussions took place as to whether all MTCs should have, as a minimum standard, access to two CT scanners, to ensure timely access to urgent diagnostics and provide resilience in the event of any unexpected outage or planned maintenance, as well as potential to increase diagnostic capabilities during any future major/mass casualty incidents.

It was discussed if requirement for Major Trauma Centres to have a minimum of two CT scanners as a quality standard should be included in the revised Major Trauma Service Specification currently being produced.

In the interim, units with one CT scanner will be required to develop or review/update any existing Business Continuity Plans regarding access to CT scanning capabilities in the event of unexpected outage or planned maintenance. Development and review of BCPs should be completed in conjunction with pre-hospital providers, regional EPRR teams, Major Trauma Networks and other relevant stakeholders who may be impacted.

This risk should also be documented on organisational and Network risk registers.

4.10.3 Warming of Paediatric Blood Products

It was identified that several organisations experienced challenges in the use of blood warming equipment, specifically when administering blood products to children.

It was requested that there be a review of best practice to effectively deliver warmed blood to children to include:

- Equipment
- Training and education
- Best practice guideline development

4.10.4 Resuscitative Thoracotomy in the Prehospital and Trauma Unit Setting

The review considered if pre-hospital resuscitative thoracotomy may have been beneficial for some of the casualties. On review of the injuries sustained, it was acknowledged that this would have been challenging for the pre-hospital teams to manage on scene. It was also acknowledged that there were no capabilities to perform this onsite prior to some patients being conveyed from scene.

For patients transferred to the nearest Trauma Unit for resuscitation and stabilisation, the reviewers recognised that there is very limited experience of paediatric traumatic cardiac arrest. There appeared

to have been multiple opportunities when resuscitative thoracotomy should have been considered to potentially aid earlier haemorrhage control in some cases.

There was discussion in the review whether the North West region should consider if enhanced prehospital care teams should be redirected to TUs as part of the major incident plan, to support the clinical capabilities in those units who have limited experience of paediatric traumatic cardiac arrest.

It was recommended that there be a review of resuscitative thoracotomy capabilities both in the prehospital and Emergency Department settings (to include training and equipment) and that paediatric trauma skills courses should be made available nationally.

4.10.5 Clinical Support to Trauma Units

The regional paediatric major trauma pathway states that patients who require immediate resuscitation and stabilisation are initially conveyed to the nearest Trauma Unit for immediate lifesaving intervention and stabilisation. It was acknowledged in the review that these units will, in the main have limited experience and training of traumatic cardiac arrest particularly in children.

The designated children's MTC in the major incident supported the Trauma Units to manage patients via a conference call, and due to the distance between the MTC and TU, were able to send a team of surgeons to support the TU surgical team. This support was praised by the TU in supporting the management of the patient. It was discussed that this may not be possible in future major incidents as it is dependent on:

- Distance between the MTC and TU (travel times in region can be up to 2 hours by road)
- Number of casualties involved in the major incident.

It was recommended that regional NHSE EPRR and MTCs consider the setting up of a remote clinical advice service, to include Trauma Team Leader, Trauma Surgeon, Anaesthetist, and other specialities dependent on types of injuries.

4.10.6 Patient Transfers into the MTC During a Major Incident

During major incidents and mass casualty events there is a risk that patients may initially be taken to hospitals that do not have services to manage their ongoing clinical and rehabilitation needs. It is important that during a major incident the regional major trauma principles are utilised to support the onward transfer of patients to the most appropriate hospital to ensure their holistic needs are met. It should be noted that this maybe via the tactical command and should be formalised as part of the hospital's major incident pathways. This will ensure that units receive the appropriate definitive management advice.

During a major incident, the regional major trauma principles should be utilised to support the transfer of patients to the most appropriate hospital to ensure their holistic needs are met. It should be noted that this maybe via the tactical command and should be formalised as part of the hospital's major incident pathways

Fig 5. Reception and resuscitation action table

No	Action	Action Owners
4.10.1	i. Reviewers recommend that all adult stand-alone trauma units and MTCs should ensure that they have paediatric sized equipment including chest drains available for young people. ii. Standalone adult MTCs and TUs need to ensure that they have access to paediatric guidelines and resources to ensure they can meet the needs of young people during a mass casualty/major incident. iii. Standalone adult MTCs and TUs to be offered paediatric trauma training	Adult standalone MTCs & MTUs
4.10.2	i. Major Trauma Clinical Reference Group to consider if the updated MT service specification should include availability of two CT scanners on a MTC site as a service quality standard. ii. For units with 1 CT scanner mitigations should be drawn up for loss of CT scanner capabilities and this should include: iii. Inclusion on the Trusts risk register iv. Units with one CT scanner will be required to develop or review/update any existing Business Continuity Plans regarding access to CT scanning capabilities in the event of unexpected outage or planned maintenance. Development and review of BCPs should be completed in conjunction with pre-hospital providers, regional EPRR teams, Major Trauma Networks and other relevant stakeholders who may be impacted.	MT CRG MTCs
4.10.3	Review of best practice to effectively deliver warmed blood to children to include: • Prehospital and reception and resuscitation • Equipment • Training and education • Best practice guideline development	National who?
4.10.4	i. Consideration if enhanced prehospital care teams can be redirected to Trauma Units as part of a major incident plan to support the clinical capabilities in those units who have limited experience of paediatric traumatic cardiac arrest. ii. It was recommended that there be a review of resuscitative thoracotomy capabilities both in the prehospital and ED settings (to include training and equipment) iii. To review access to paediatric trauma skills courses nationally.	Regional NHSE EPRR Team National who?
4.10.5	It was recommended that regional NHSE EPRR and MTCs consider the setting up of a remote clinical advice service to include Trauma Team Leader, Trauma Surgeon, Anaesthetist, and other specialties dependant on types of injuries.	Regional NHSE EPRR Team / MTC EPRR
4.10.6	During a major incident, the regional major trauma principles should be utilised to support the transfer of patients to the most appropriate hospital to ensure their holistic needs are met. It should be noted that this maybe via the tactical command and should be formalised as part of the hospital's major incident pathways.	Regional local emergency hospitals, MTUs and MTCs

4.11 Interhospital Transport Service Role in Major Incidents

The scope of the regional paediatric transport service does not routinely include the transfer of time critical major trauma patients. Transfer of this type falls within the remit of statutory ambulance service providers and is arranged following agreed referral and transfer process, with the transferring organisation providing appropriately trained personnel based on the level of injuries sustained and intervention required en-route

The transport service does provide advice around stabilisation for transportation of these patients.

During the major incident the regional paediatric transport service were contacted by a Trauma Unit for advice on the stabilisation and suitability for transfer of a major incident patient. The Team undertook an assessment of their capacity to mobilise and support the Trauma Unit. They advised the Trauma Unit team that should the patient became stable enough for transfer prior to their arrival, they should move the patient as per local policy to the paediatric MTC to avoid delays. On the team's arrival they supported stabilisation, communication with the MTC and onward transfer to the MTC post theatre.

It was noted that the regional paediatric transport service is not part of the major incident escalation plan.

Clarification of the role and remit of the paediatric transport service as part of a major incident/mass casualty event should therefore be determined.

Fig. 5 Interhospital Transport Service Actions

No	Action	Action Owners
4.11	Clarification of the role and remit of the paediatric transport service as part of a major incident / mass casualty event should be determined.	Regional Paediatric Transport Services / Regional NHSE EPRR Leads

4.12 Definitive Care

4.12.1 Surgical Management of Wounds

Damage control surgery guidelines recommend patient's wounds should be cleaned and left open and patients should return to theatre for wound assessment and closure.

It is recommended that there be a review of national data to ascertain best practice for children regarding primary wound washout and closure rather than having repeat surgical interventions.

4.12.2 Paediatric Critical Care Capacity Regionally and Nationally

The regional paediatric critical care operational delivery networks (PCC ODNs) should be involved in regional major incident / mass casualty planning this should include:

- Bed capacity (regional/national)
- Surge plans
- Process for transfer of patients out of PCC level 3 centres
- Care of a critically sick child / young person under 16 years outside of paediatric critical care level 3 environment in extreme and exceptional circumstances policy

4.12.3 Paediatric Surgery in Children Operational Delivery Networks (SiC ODNs)

We recommend that there is planning in place around paediatric surgery in major incidents.

4.12.4 Communication Between Units

During a major incident patients can be widely distributed across the region in a variety of units. To ensure equity of access to services regarding ongoing clinical management and rehabilitation care, it was recommended that the regional ICB establish daily meetings with all relevant provider Trusts, designated MTC's and Major Trauma Networks. The objective being to retain oversight of all cases and ensure that patients remain in or are transferred to the most appropriate setting to meet the individual needs of them and their families.

Fig. 6 Definitive Care Actions

No	Action	Action Owners
4.12.1	There should be a review of the national data to ascertain best practice for children regarding primary wound washout and closure rather than having repeat surgical interventions.	National who?
4.12.2	The regional paediatric critical care operational delivery networks should be involved in regional major incident / mass casualty planning this should include: • Bed capacity (regional/national) • Surge plans • Process for transfer of patients out of PCC level 3 centres • Care of a critically sick child / young person under 16 years outside of paediatric critical care level 3 environment in extreme and exceptional circumstances policy	PCC ODNs
4.12.3	It is recommended that there is planning in place around paediatric surgery in major incidents.	SiC ODNs
4.12.4	To ensure equity of access to services regarding ongoing clinical management and rehabilitation care it was recommended that the regional ICB establish daily meetings with all impacted sites, designated MTC's and Major Trauma Networks to reduce inequity of access to specialist services.	Regional ICBs

4.13 Rehabilitation

4.13.1 Psychology Support

All admitted patients and their families received in hospital psychological support as part of their inpatient stay. All children have continued to receive outpatient psychology services from the MTC. For the adult patients there is no available MTC psychological support on discharge however the ICB have set up a psychology hub that are supporting the patients.

It is recommended that the regional NHSE EPRR teams ensure that psychological hubs are available in the event of a major incident, this should include support for staff.

We will be able to comment further around the rehabilitation processes in 6-12 months.

4.13.2 Vocational Rehabilitation

The paediatric MTC Coordinators have linked with all the children's schools during the holidays and planned the support required on their return to education. It was unclear whether the same has been completed for the adult patients admitted to the MTC.

MTCs and TUs should support the return to school and work for all patients impacted by major trauma events.

4.13.3 Charity and third sector organisations

All paediatric and adult patients have been signposted to appropriate charity and third sector organisations with consent.

All patients to be offered appropriate charity and third sector support

Fig. 6 Rehabilitation actions

No	Action	Action Owners
4.13.1	Regional EPRR teams to ensure that psychological hubs are available in the event of a major incident, this should include support for staff.	Regional NHSE EPRR Teams / ICB's
4.13.2	MTCs and TUs should support the return to school and work for patients impacted by major trauma events.	MTCs / TUs
4.13.3	All patients to be offered appropriate charity and third sector support	MTCs / TUs

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4.14 Staff Health and Wellbeing

4.14.1 Psychological Support for Staff

At the review it was evident that there was an inequity of access to health and wellbeing support for staff following the major incident. Some Trusts had well established support mechanisms in place e.g. TRIM, however some staff groups have had no access to psychological support. The regional ICB have set up the psychological wellbeing hub however this information had not filtered into the impacted hospital trusts.

It is recommended that all trusts review their staff health and wellbeing support in a major incident. Trusts should also ensure that communications are sent to all staff groups regarding the ICB psychology support hub.

4.14.2 Cross Site Psychological Support

For teams who access TRIM psychological wellbeing support, this should be led by a TRIM trained member of staff from outside of the impacted organisation. It may be beneficial for organisations to identify a 'buddy' organisation to enable these sessions to run effectively in the future.

Fig. 7 Staff health and wellbeing actions

No	Action	Action Owners
4.14.1	i. Regional EPRR teams to ensure that psychological hubs are available in the event of a major incident, this should include support for staff. ii. All trusts review their staff health and wellbeing support in a major incident including potential trauma risk management courses. iii. Trusts should also ensure that communications are sent to all staff groups regarding the ICB psychology hub support	Regional NHSE EPRR/ICB's MTUs and MTC Trusts
4.14.2	Organisations to identify a 'buddy' organisation to enable TRIM sessions to run effectively.	MTC / MTU Trusts

4.15 Major Trauma Specialised Services Clinical Networks (SSCN's) (Formerly Operational Delivery Networks)

4.15.1 Role of the Major Trauma SSCN/ODN in a Major Incident

The role of the Major Trauma ODNs/ SSCN's during a major incident was discussed in the review. Networks are not commissioned to provide an on- call service nor to assume a formal tactical role in response an incident However, as outlined within the National Concept of Operations for managing Mass Casualties networks can:

- Assist with the coordination of the network's response, including local supply management.
- Provide supporting arrangements with respect to patient transfer

In accordance with this, networks should agree a plan with ICB and NHSE EPRR teams to agree and formalise channels of communication and to determine actions and processes that the network can support if available at the time of the incident or in subsequent follow up activity if the incident occurs out of hours. This would ensure that the network teams would have the necessary regional oversight of the distribution and management of cases from the incident and assist organisations and teams to facilitate any onward transfers of care or referral to other services that may be required to optimise patient and family care and support.

4.15.2 Clinical Review Meeting

The Major Trauma Networks should follow their normal governance processes around incidents and, morbidity and mortality reviews. Following a major incident this should be completed in conjunction with regional and national NHSE EPRR teams. It should be noted that any review will potentially be subject to disclosure where a criminal investigation, public inquiry or inquest takes place or where the Freedom of information act (FOI) applies.

Regional and national learning from the review will be shared as agreed by NHSE EPRR leads.

Fig 9. Major Trauma Operational Delivery Network Actions

No	Action	Action Owners
4.15.1	i. Assist with the coordination of the network's response, including local supply management. ii. Provide supporting arrangements with respect to patient transfer. iii. Networks should agree a plan with ICB and NHSE EPRR teams to agree and formalise channels of communication and to determine actions and processes that the network can support if available at the time of the incident or in subsequent follow up activity if the incident occurs out of hours.	MT SSCNs/ODNs
4.15.2	The Major Trauma Networks should follow their normal governance processes around incidents and, morbidity and mortality reviews. Following a major incident this should be completed in conjunction with regional and national NHSE EPRR teams.	MT SSCNs/ODNs

5.0 Conclusion and next steps

The joint Network led Clinical Review of the Southport Incident has highlighted areas of good practice and identified opportunities for learning on both a regional and national scale. This learning could be adopted to inform and enhance provider preparedness and response to future mass casualty or major incidents.

Although the remit of the review was to focus on the clinical response and management of patients it has also highlighted elements of the EPRR processes which had a direct impact on the clinical management of the patients involved.

The review has evaluated each individual patient's pathway and, as a result, actions and recommendations have been identified that are applicable across multiple stakeholders and provider organisations (see appendix 4).

The review has provided opportunities for those present, including local clinicians and experts within the field of major trauma care, to contribute their knowledge to assess and evaluate patient outcomes and to identify opportunities for learning. This learning should be used to influence the future management of paediatric or other mass casualty/ major incidents. Whilst the potential scale and impact of any future incidents is difficult to predict, it is important that we continue to learn the lessons from recent events and utilise this to influence change and inform the clinical management for patients involved in event of future, comparable, scenarios.

The report has been reviewed prior to its distribution by NHSE National Resilience Team (comment to add others as required as part of the review) and will be shared with relevant stakeholders as directed.

6.0 Bibliography and References

1. https://www.england.nhs.uk/long-read/major-incident-triage-tools/
2. https://www.england.nhs.uk/wp-content/uploads/2023/04/PRN00365iv-ten-second-triage-tool-april-2023.pdf
3. https://www.england.nhs.uk/wp-content/uploads/2023/04/PRN00365ii-nhs-major-incident-triage-tool-april-2023.pdf

7.0 Appendices

7.1 Appendix 1- Clinical Review Meeting Terms of Reference

Version Control

Reference Number:			Date of First Publication:	
Authors:	Jo Butler (JB)		Review Frequency:	
Version Log and Amendments Tracker				
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0.2	05/08/2024	Draft	Second Draft	CE / HB
0.3	07/08/2024	Final	To distribute	CE/HB

Document control

The controlled copy of this document is maintained by C&M Major Trauma Network. Any copies of this document held outside of that area, in whatever format (e.g. paper, email attachment), are considered to have passed out of control and should be checked for currency and validity.

Overview

The Cheshire and Mersey Major Trauma Network and the Northwest Children's Major Trauma Network have been asked by the National Director for NHS Resilience to coordinate the review into the clinical response to the Major Incident that occurred in Southport on Monday 29th July 2024.

Context

The aims of the Cheshire & Mersey Major Trauma Network (CMMTN) and North West Children's Major Trauma Network (NWChMTN) Is to ensure quality standards and networked patient pathways are in place. They support the management of capacity and demand, improvement and delivery of a commissioned pathway, with a key focus on the quality and equity of access to service provision. CMMTN and NWChMTN are committed to learning from major trauma incidents and routinely reviews episodes of patient care on the major trauma pathway. This review is in line with the commitment to learning and also aligns to the NHS Constitution values of working together for patients and commitment to quality of care.

This review serves a development and learning function. Each organisation that takes part in and contributes to the review remains responsible and accountable for its actions in line with its contractual commissioned requirements, statutory duties and obligations.

Strategic Aim

To review the major trauma care received by patients involved in the incident that occurred in Southport on Monday 29th July 2024.

Key objectives

Collaborate with relevant major trauma network stakeholders to obtain the necessary information required to conduct the review.

To identify and disseminate lessons learnt regionally and nationally.

To review the care of patients from initial triage through the major trauma pathway.

Ensure that any identified learning is used in the development of future guidance and incorporated in the Clinical Response to Major Incidents

In Scope

All patients identified as having suffered physical injuries during the course of the major incident.

Clinical major trauma care from initial triage through to the conclusion of the major trauma pathway or treatment to date.

Organisational Major Incident response relevant to the delivery of clinical care (casualty dispersal, networked clinical advice etc.).

Out of Scope

Episodes of health care prior to the commencement of the incident.

The wider system Major Incident Response will form part of the usual EPRR debriefing process

Membership

- The participants in the review process will be as follows.
- **Specialised Services Clinical Networks / Operational Delivery Networks:**
- Chesire & Mersey Major Trauma Network Director, Medical Lead & QI Lead
- North West Children's Major Trauma Network Manager, Medical Lead(s) & Lead Nurse
- Cheshire & Mersey Critical Care Network Medical Lead
- North West Paediatric Critical Care Network Medical Lead
- North West Paediatric Surgery in Children Network Medical Lead

Acute Trusts:

- Medical Director & Trust Trauma Lead (or appropriate deputy):
- North West Ambulance Service NHST
- Alder Hey Children's Hospital NHSFT

- Liverpool University Hospitals NHSFT Aintree
- Mersey & West Lancashire Teaching Hospitals NHST – Southport & Ormskirk Hospital
- Manchester University NHSFT – Royal Manchester Children's Hospital
- Cheshire & Mersey Major Trauma Network Trauma Unit Trauma Clinical Lead
- Cheshire & Mersey Major Trauma Network Trauma Unit Trauma Lead Nurse

Helicopter Emergency Medical Services / BASIC

- North West Air Ambulance Service - Medical Director (or appropriate deputy)
- Great North Air Ambulance Service - Medical Director (or appropriate deputy)
- Midlands Air Ambulance Service – Medical Director (or appropriate deputy)
- North West BASICS – Medical Director (or appropriate deputy)

Transfer Service

- North West & North Wales Paediatric Transport Service - Medical Director (or appropriate deputy)

Regional & National Representation:

- NHS England National Director of Resilience
- Head of Emergency Preparedness, Resilience & Response (EPRR) – Cheshire & Merseyside
- NHS England – North West
- NHS England National Clinical Director for Major Trauma and Burns
- NHS England National Speciality Advisor for Major Trauma and Burns
- NHS England National Clinical Director for Children and Young People
- National Ambulance Resilience Unit
- External Paediatric Major Trauma Network Lead
- Cheshire & Merseyside Integrated Care Board – Medical Director (or appropriate deputy)
- NHS England North West Service Specialist – Head & Trauma.
- NHS England North West Service Specialist – Women and Children

Other Membership

The Network team may also request other members to be co-opted as required. Details of additional memebrship will be disseminated ahead of the review meeting.

Format of the review

The review process will consist of obtaining information from providers using a proforma. The information on the proforma will be aggregated to form the basis of a comprehensive clinical review of the clinical care of each patient.

Each case will then be subject to review by a panel that will include clinical representatives both internal and external to Cheshire and Mersey and North West Children's Major Trauma

Networks and partners from NHS England. Where feasible, the review panel will comprise clinicians with appropriate clinical experience and knowledge of major trauma pathways and processes and were ideally not directly involved in patient care.

Initial outputs from the panel will be to disseminate any immediate learning or action required, this will then also inform next steps in terms of activities or events required to facilitate engagement and learning on a wider regional scale.

Finance

Meetings will be held virtually or within NHS facilities, with any costs associated with the meetings met by the hosting organisation.

Additional costs work will be borne by the member organisations “where they fall” (i.e. there is no expectation for cross charging of organisations for time spent attending meetings, travel expenses or hosting meetings).

In the event a planned activity indicates a specific spending need, members will discuss and agree any expected costs and avenues of funding during the planning phase.

Disclosure

Any review is potentially subject to disclosure where a criminal investigation, public inquiry or inquest takes place or where the Freedom of information act (FOI) applies. Review participants are advised to seek advice from their Caldicott Guardian, or legal team should they require it.

7.2 Appendix 2 – Major Incident: Network Rapid Review Form

Major Incident: Network Rapid Review Form

Official Sensitive Once Completed

An individual form should be completed for each patient. Pre-hospital providers will be requested to complete all fields in green and hospital teams to complete all other fields. The Network team will aggregate completed forms, to provide full time line for each patient. Completed forms to be sent to calum.edge@nhs.net

Reporter details		Patient details	
Reporting organisation		NHS / Hospital Number	
Form completed by		Date of Birth / Age	
Date completed	Click or tap to enter a date.	Pre-Hospital Incident Number	

Date of incident	Click or tap to enter a date.	**Mechanism of injury**	Choose an item.

Pre-Hospital Prioritisation *(Please indicate categorisation based on MITT)*							
Priority 1	☐	Priority 2	☐	Priority 3	☐	Dead	☐

On scene assessment team				
NWAS ☐	NWAA ☐	GNAAS ☐	BASICS ☐	Other ☐
Click or tap here to enter text.				

Level of clinician *(tick all that apply)*				
Medic ☐	AP ☐	CCP ☐	Paramedic ☐	Technician ☐
Click or tap here to enter text.				

Key times	
Time of arrival on scene	
Time at patient	
Time left scene	

Transfer details	
Transfer destination	
Conveyed via land or air?	
Time of arrival at destination	

Major Incident: Network Rapid Review Form

Pre-hospital chronology *(Please provide full time line of events including injuries identified, interventions, treatments and actions below **including decision making process for transfer destination**)*
Click or tap here to enter text.

Emergency Department management *(tick all that apply)*				
Pre-Alert Received ☐	Trauma Team Activation ☐	Consultant TTL Present ☐	MHP Activated ☐	Speciality Consultant ☐

Immediate interventions				
RSI ☐	Thoracostomies ☐	Chest Drain Insertion ☐	Resuscitative Thoracotomy ☐	Damage Control Surgery ☐
Other: Click or tap here to enter text.				
Total Number of Blood Products Given: Click or tap here to enter text.				

Emergency Department chronology *(Please provide full time line of events including interventions, treatments and actions below)*
Click or tap here to enter text.

External speciality assistance required? *(Please provide detail of Speciality, Grades, and Organisation that staff attended from, below)*
Click or tap here to enter text.

Injuries sustained *(Please include location and description of wounds and all injuries sustained, below)*

Major Incident: Network Rapid Review Form

Click or tap here to enter text.

Destination from Emergency Department					
Direct to Ward ☐	Theatre to Ward ☐	Theatre to Critical Care ☐	Direct to Critical Care ☐	Transferred Out* ☐	Home ☐
*Please provide details of transfer to external hospital below, including destination and date and time of transfer, below:					
Click or tap here to enter text.					

Theatre interventions *(Please provide brief information of surgery performed)*
Click or tap here to enter text.

Ward Interventions *(Please provide brief information of any ward interventions performed **including any complications during admission)***

Inpatient Rehabilitation Interventions *(Please provide brief information of any inpatient rehabilitation requirements)*		
Inpatient Clinical Psychology Review?	Yes ☐	No ☐
Social Care Review?	Yes ☐	No ☐

Major Incident: Network Rapid Review Form

Discharge Destination				
Transfer to other NHS facility* ☐	Transfer to Rehab facility* ☐	Home ☐	Length of Stay	(Days)
*Please provide details of transfer to external hospital below, including destination and date and time of transfer, below:				

Follow Up / Community Rehabilitation *(Please provide brief information of any follow up / rehabilitation requirements on discharge including any gaps in service provision (please also include follow up from third sector/charity organisations)*				
MTC Clinic ☐	Clinical Psychology Clinic* ☐	Community/Primary Care ☐	Trauma Support Services ☐	Other ☐
*If no Psychology clinic available – please detail any signposting to other services				
Click or tap here to enter text.				

Return to Education or Employment Advice/Support to be Provided?	Yes ☐	No ☐
please provide detail and any signposting to other services		

Major Incident: Network Rapid Review Form

Any identified issues? (Please provide extra detail in text box below)				
Pathway(s) ☐	Staffing ☐	Facilities ☐	Equipment ☐	Communication ☐
Other: Click or tap here to enter text.				

Any immediate actions implemented since incident? (Please provide extra detail in text box below)
Click or tap here to enter text.

Outcome					
Alive	☐	Dead	☐	Date of Death	Click or tap to enter a date.

7.3 Appendix 3 – Attendees

Name	Job role	Organisation
David Wilson	Acting on behalf of Network Clinical Director	Chesire & Mersey Major Trauma Network
Julie Peacock	Network Director	Chesire & Mersey Major Trauma Network
Calum Edge	Quality Improvement Lead	Chesire & Mersey Major Trauma Network
Lorraine Abbott	Administrations & Project Support Officer	Chesire & Mersey Major Trauma Network
Helen Blakesley	Network Manager	North West Children's Major Trauma Network
Bimal Mehta	Network Clinical Lead	North West Children's Major Trauma Network
Naomi Davis	Network Clinical Lead	North West Children's Major Trauma Network
Kelly McCarty	Network Lead Nurse	North West Children's Major Trauma Network
Mark Children	Clinical Lead	North West Paediatric Surgery in Children ODN
Timothy Smith	Medical Director	North West Ambulance Service NHST
Luke Marriner	Consultant Paramedic	North West Ambulance Service NHST
Andy Curran	Medical Director	North West Air Ambulance Service
Chris Smith	Medical Director	Great North Air Ambulance Service
Ben Taylor	Medical Director	Midlands Air Ambulance Service
Alfie Bass	Medical Director	Alder Hey Children's Hospital NHSFT
Sarah Stibbards	Trust Trauma Lead	Alder Hey Children's Hospital NHSFT
Benedetta Pettorini	Surgical Lead	Alder Hey Children's Hospital NHSFT
Rebecca Hanlon	Medical Director	Liverpool University Hospitals NHSFT Aintree
Simon Scott	Trust Trauma Lead	Liverpool University Hospitals NHSFT Aintree
Peter Williams	Medical Director	Mersey & West Lancashire Teaching Hospitals NHST
Craig Rimmer	Trust Trauma Lead	Mersey & West Lancashire Teaching Hospitals NHST
Graham Mason	Deputy Medical Director	Royal Manchester Children's Hospital
Ralph Mackinnon	Trust Trauma Lead	Royal Manchester Children's Hospital
Suzy Emsden	Medical Director	North West & North Wales Paediatric Transport Service
Nikhil Misra	MVRP Health Lead / Trauma Surgeon	MVRP / LUHFT Aintree

Giles Haythornthwaite	Paediatric Major Trauma Network Lead	Peninsula and Severn Trauma Networks
Hannah Coles	Trauma Clinical Lead	Regional Trauma Unit
Jackie Milliken	Trauma Lead Nurse	Regional Trauma Unit
Mike Prentice	National Director of Resilience	NHS England - National
Stephen Groves	Deputy National Director of Resilience	NHS England - National
Robert Bentley	National Clinical Director for Major Trauma and Burns	NHS England - National
Malcolm Tunnicliffe	EM and PHC Consultant at Kings College / MT CRG Rep	NHS England - National
Simon Kenny	National Clinical Director for Children and Young People	NHS England - National
Christain Cooper	National Ambulance Resilience Unit	NHS England - National
Jo Butler	Head of Emergency Preparedness, Resilience & Response (EPRR)	NHS England North West
Louise Sinnott	Head of Acute Strategy and Transformation, Specialised Commissioning NHSE	NHS England North West
Rowan Pritchard-Jones	Medical Director	Cheshire and Mersey Integrated Care Board
Matt Smith	Merseyside Police Representative	Merseyside Police

7.4 Appendix 4 – Actions Table

No	Major Incident Alert Actions	Action Owners
4.1.1	A review of major incident alerts and cascading of communication should be performed by prehospital services and regional ICB EPRR teams. Prehospital services to review the use of HALO's during a MI response.	Prehospital / Regional ICB EPRR Teams
4.1.2	Existing pre-hospital divert, and deflection policy should be reviewed specifically relating to peadiatric major trauma, to determine processes for patients were there may already be potential for extended travel times and to consider conveyance to the next available Children's Major Trauma Centre during a major incident, where it is clinically and logistically feasible to do so.	Prehospital / Regional ICB EPRR Teams /MTC's
No	**Prehospital Setting Actions**	**Action Owners**
4.2.1	Review use of chest seals by zero responders	National who?
4.2.2	Review of MITT and TST in penetrating trauma regarding: i. Prioritisation for interventions i.e. blood products ii. Use in penetrating trauma due to all patients being assessed as P1's including those with bystander or zero responder application of tourniquet	Prehospital Services / National who?
4.2.3	For prehospital services to review triage process for identification and prioritisation patient markings for major incidents.	Prehospital Services
4.2.4	It is recommended that there be a national review of the MITT to review how prioritisation of clinical interventions and critical care team distribution can take place during a major incident.	National Who?
4.3.1	A review of the triaging at scene and clearing of the site has been recommended by the reviewers and any learning points be fed back as part of the review process.	Prehospital Services
4.3.2	Review access to Airwaves Major Incident Channel for out of region mutual aid responders	Regional NHSE EPRR Leads
4.3.3	It has been recommended that the prehospital service review communication between the Complex Incident Hub and clinician in command at scene regarding allocation and arrival time of assets on scene.	Prehospital Services
4.3.4	To look at addressing use of video footage from prehospital teams and utilising this for learning around major incident scene management.	National who?
4.4.1	Review regarding the threshold for moving patients around region when mass casualty threshold isn't reached in special circumstances	Regional NHSE EPRR Leads

4.4.2	NW NHSE EPRR have been requested to review the regional mass casualty distribution matrix to ensure it reflects current clinical capacity, provision and capabilities in units.	Regional NHSE EPRR Leads
4.4.3	Exploration of the distribution of patients during a major incident should take place to ensure that patients are transferred to units which are able to manage the clinical needs the patient and family.	Regional NHSE EPRR Leads
4.4.4	All adult standalone trauma units and MTCs should ensure that they have smaller sized equipment e.g. chest drains available for young people and small adults.	Standalone Adult MTCs / MTUs
4.4.5	The review recommends that prehospital services consider keeping families together, when possible, for the patients ongoing care as part of the major incident distribution plan.	Prehospital Services
4.5	Should clinical capabilities of HEMs crews be standardised? This should be reviewed nationally.	National who?
4.6.1	The review recommended that the clarification of the formal death diagnosis process be sought during major incidents.	National who?
4.6.2	i. As part of the learning from this review the process around child death in the prehospital setting during a major incident should be reviewed to ensure the family receives the same level of bereavement support and sudden unexpected death processes are commenced. ii. Further clarification needs to be sought around appropriate processes for traumatic child deaths and police investigations to ensure that any learning /new processes include children who are unable to be conveyed to hospital as part of criminal investigations.	National who?
4.7	Review and learning of paediatric analgesia administration in the prehospital setting	Prehospital Service
No	**Blood and Transplant Services Actions**	**Action Owners**
4.8.1	Network to link in with NHS Blood and Transplant Service to enquire if national blood shortage impacted on blood product availability during the major incident?	MT Networks
4.8.2	Defining actions to be taken during major incident stand-by and full declaration need to be clarified, specifically relating to availability of blood products to ensure that additional blood product stocks are provided to the correct organisations.	Prehospital services/ MTC & MTU EPRR
No	**Blood borne virus screens and immunisations actions**	**Action Owners**
4.9	All hospitals should have in place a local guideline for the screening of blood borne viruses and immunisations in the case of penetrating injury and mass casualty events where there is a risk of exposure.	Hospital Trusts
No	**Reception and Resuscitation**	**Action Owners**
4.10.1	i. Reviewers recommend that all adult stand-alone trauma units and MTCs should ensure that they have	Adult standalone MTCs & MTUs

	paediatric sized equipment including chest drains available for young people. ii. Standalone adult MTCs and TUs need to ensure that they have access to paediatric guidelines and resources to ensure they can meet the needs of young people during a mass casualty/major incident. iii. Standalone adult MTCs and TUs to be offered paediatric trauma training	
4.10.2	i. Major Trauma Clinical Reference Group to consider if the updated MT service specification should include availability of two CT scanners on a MTC site as a service quality standard. ii. For units with 1 CT scanner mitigations should be drawn up for loss of CT scanner capabilities and this should include: iii. Inclusion on the Trusts risk register iv. Units with one CT scanner will be required to develop or review/update any existing Business Continuity Plans regarding access to CT scanning capabilities in the event of unexpected outage or planned maintenance. Development and review of BCPs should be completed in conjunction with pre-hospital providers, regional EPRR teams, Major Trauma Networks and other relevant stakeholders who may be impacted.	MT CRG MTCs
4.10.3	Review of best practice to effectively deliver warmed blood to children to include: • Prehospital and reception and resuscitation • Equipment • Training and education • Best practice guideline development	National who?
4.10.4	i. Consideration if enhanced prehospital care teams can be redirected to trauma units as part of a major incident plan to support the clinical capabilities in those units who have limited experience of traumatic cardiac arrest in paediatrics. ii. It was recommended that there be a review of resuscitative thoracotomy capabilities both in the prehospital and ED settings (to include training and equipment) III. To review access to paediatric trauma skills courses nationally.	Regional NHSE EPRR Team National who?
4.10.5	It was recommended that regional NHSE EPRR and MTCs consider the setting up of a remote clinical advice service to include Trauma Team Leader, Trauma Surgeon, Anaesthetist and other specialities dependant on types of injuries.	Regional NHSE EPRR Team / MTC EPRR
4.10.6	During a major incident, the regional trauma principles should be utilised to support the transfer of patients to the most appropriate hospital to ensure their holistic needs are met. It	Regional local emergency

	should be noted that this maybe via the tactical command and should be formalised as part of the hospital's major incident pathways.	hospitals, MTUs and MTCs
No	**Interhospital Transport Service Actions**	**Action Owners**
4.11	Clarification of the role and remit of the paediatric transport service as part of a major incident / mass casualty event should be determined.	Regional Paediatric Transport Services / Regional NHSE EPRR Leads
No	**Definitive Care Actions**	**Action Owners**
4.12.1	There should be a review of the national data to ascertain best practice for children regarding primary wound washout and closure rather than having repeat surgical interventions.	National who?
4.12.2	The regional paediatric critical care operational delivery networks should be involved in regional major incident / mass casualty planning this should include: • Bed capacity (regional/national) • Surge plans • Process for transfer of patients out of PCC level 3 centres • Care of a critically sick child / young person under 16 years outside of paediatric critical care level 3 environment in extreme and exceptional circumstances policy	PCC ODN's
4.12.3	It is recommended that there is planning in place around paediatric surgery in major incidents.	SiC ODNs
4.12.4	To ensure equity of access to services regarding ongoing clinical management and rehabilitation care it was recommended that the regional ICB establish daily meetings with all impacted sites, designated MTC's, MT Network to reduce inequity of access to specialist services.	Regional ICBs
No	**Rehabilitation Actions**	**Action Owners**
4.13.1	Regional EPRR teams to ensure that psychological hubs are available in the event of a major incident, this should include support for staff.	Regional NHSE EPRR Teams / ICB's
4.13.2	MTCs and TUs should support the return to school and work for patients impacted by major trauma events.	MTCs / MTUs
4.13.3	All patients to be offered appropriate charity and third sector support	MTCs / MTUs
No	**Staff Health and Wellbeing Actions**	**Action Owners**
4.14.1	i. Regional EPRR teams to ensure that psychological hubs are available in the event of a major incident, this should include support for staff.	Regional NHSE EPRR/ICB's

	ii. All trusts review their staff health and wellbeing support in a major incident including potential trauma risk management courses iii. Trusts should also ensure that communications are sent to all staff groups regarding the ICB psychology hub support	MTUs and MTC Trusts
4.14.2	Organisations to identify a 'buddy' organisation to enable TRIM sessions to run effectively.	MTC / MTU Trusts
No	**Major Trauma Operational Delivery Network Actions**	**Action Owners**
4.15.1	i. Assist with the coordination of the network's response, including local supply management. ii. Provide supporting arrangements with respect to patient transfer iii. Networks should agree a plan with ICB and NHSE EPRR teams to agree and formalise channels of communication and to determine actions and processes that the network can support if available at the time of the incident or in subsequent follow up activity if the incident occurs out of hours.	MT SSCNs/ODNs
4.15.2	The Major Trauma Networks should follow their normal governance processes around incidents and, morbidity and mortality reviews. Following a major incident this should be completed in conjunction with regional and national NHSE EPRR teams.	MT SSCNs/ODNs