



North West Children's Major Trauma Network
Always Children First

**North West Children's Major Trauma
Operational Delivery Network
Annual Report
2022/2023**

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Glossary

AHCH	Alder Hey Children's Hospital
BOAST 4	British Orthopaedic Association Standard 4, setting out key markers for care of patients with high energy open lower limb fractures
CYP	Child/Young Person
DGH	District general hospital
CYP	Children and Young People
ICB	Integrated Care Boards (ICB's)
LEH	Local emergency hospital
MTC	Major trauma centre
MT	Major trauma
NW	North West
NWAA	North West Air Ambulance Service
NWAS	North West Ambulance Service
ODN	Operational Delivery Network
IDACI	Income Deprivation Affecting Children Index
ISS	Injury Severity Score is a score ranging from 1, indicating minor injuries to 75, indicating very severe injuries that are very likely to result in death. An ISS between 9 and 15 is considered moderate. An ISS of 16 or more is considered severe. ISS is calculated using the Abbreviated Injury Scale (AIS). The AIS is a value between 1 (minor) and 6 (very severe) which can be assigned to each injury. TARN currently uses the AIS 2005 system, the most recent available.
PCC	Paediatric Critical Care
PCC SiC LTV ODN	Paediatric Critical Care, Surgery in Children and Long-Term Ventilation ODN
RMCH	Royal Manchester Children's Hospital
TARN	Trauma Audit Research Network
TU	Trauma Unit
W	W-Variable shows hospital outcome performance. W represents excess deaths or survivors per 100 patients. This is calculated using observed and expected survivors and the total number of patients in the hospital's rate of survival dataset.
Ws	Ws Excess deaths or survivors (W) standardised according to hospital case mix using the TARN fraction. A hospital with the same case mix as the overall TARN population will have identical W and Ws values. A hospital whose case mix differs from the overall TARN population will have different W and Ws values.

Foreword

We are delighted to present the Annual Report of the North West Children's Major Trauma Operational Delivery Network (ODN) for 2022/2023.

The Network has come a long way since its introduction in 2012 and continues to make a positive impact on children with major trauma (MT) across the North West (NW) of England, North Wales, and the Isle of Man. This success relies on the good collaboration and the shared goals, not only between the two Children's Major Trauma Centres (MTC's) at Alder Hey Children's Hospital and Royal Manchester Children's Hospitals, but throughout the network of children's trauma units (TU's), district general hospitals (DGH), North West pre-hospital services, regional adult MT ODN's, and the North West & North Wales Transport Service.

The strength of the Network is the active participation of its members which meet quarterly to discuss all aspects of the MT pathway for children. Attendance remains good from all parts of the Network including North Wales and the Isle of Man.

Throughout 2022/23 the Network Leadership Team have continued to make progress with its work plan including:

- Partaking and completing peer reviews across the NW region
- Update of the Major Trauma Network Guidelines
- Leading on the Children's National Trauma and Rehabilitation Networks
- Developing and collaborating on a number of regional and national education events

We are looking forward to the continued development of the Network and the many areas of work to be developed in 2023 and beyond.

Miss Naomi Davis and Dr Bimal Mehta

Joint Clinical Leads of the North West Children's Major Trauma ODN

Helen Blakesley

Network Manager North West Children's Major Trauma ODN

Executive Summary

This report provides a summary of the performance, key achievements, and challenges of the North West Children's Major Trauma Operational Delivery Network. This report focuses on all aspects of the MT pathway which includes:



Injury produces a significant health burden for children, being a leading cause of both death and disability. About half of the 4 million attendances by children to EDs each year follow an injury, but most are minor. Information about the more serious injuries is collected by the Trauma Audit and Research Network (TARN), the UK's national audit of major trauma. The data in this report utilises the Network data available from TARN.

To ensure consistency, only patients with an injury severity score (ISS) of 9 and above are included in this report. The Network acknowledges that there are significant numbers of patients who present as major trauma candidates to the emergency departments with an ISS below 9 that are admitted to the MTC's and TU's across the region. These children may have significant life changing injuries and require multidisciplinary care across the pathway however data collection is not consistent for this cohort of patients.

In 2022 293 children with an ISS of 9-75 were admitted to the Networks 2 Children's MTC'S at Alder Hey Children's Hospital and Royal Manchester Children's Hospital. The survival rates of major trauma across the two regional MTC's are higher than expected as measured by the Ws score of 2.05 additional expected survivors.

The correlation between deprivation and MT injury is becoming increasingly evident with 67% of the children admitted to the MTC's living in the top 3 deciles for deprivation. Due to the mechanism of trauma injuries, there are high levels of safeguarding and psychosocial needs across the patient cohort

In 2022/2023 the Network has supported the regional peer review cycle for the NW TU's. This has seen the team visit and assess 13/15 of the regional TU's in England. The peer reviews have supported the Network to develop its 2023/2024 work plan to focus on the needs of the wider trauma system. There are plans in place to peer review both children's MTC's in June 2023.

The Network has participated in several education events which cover all aspects of the trauma pathway. We are particularly proud of the first trauma simulation course which we set up and trailed in the region for our TU's to attend.

The Network Major Trauma Clinical Guidelines have now been updated in 2023 and are currently being ratified, this has involved multiple stakeholders across the region. The updated guidelines will help to support the development of the education strategy.

To ensure that the Network is independent it has appointed an independent chair in June 2023. The chair will oversee the partnership working between the stakeholder organisations, engage with Board colleagues and other stakeholders to maximise the benefits of collaborative working, and ensure shared decision making and effective governance.

The Network



Map showing North West Regional Trauma Unit's and the 2 Children's Major Trauma Centre's

The North West Children's Major Trauma Operational Delivery Network was formalised in 2021. The Network is unique in being the only designated Children's Operational Delivery Network for Major Trauma in England. The Network is cohosted by Royal Manchester Children's Hospital (RMCH) and Alder Hey Children's Hospital (AHCH) with the financial envelope held within Manchester University NHS Foundation Trust

Population

The Network provides a service to the conurbations of Cheshire and Mersey, Greater Manchester, Lancashire and South Cumbria, North Wales, and the Isle of Man. The current population for children aged less than 16 years old served by the Network is c.1.4 million (19.1% of the total NW population).

Geography

A key challenge for the Network is the wide geographical area it serves with a mix of urban and remote rural populations with considerable distance for some populations from the MTCs in Liverpool and Manchester. For some children with major trauma their injuries are time critical, and it is essential that they are transferred as quickly as possible into the MTC's. Across the network a number of hospitals have over 1 hours travel from the MTC with Furness General and Nobles Hospital having over a 2-hour travel time into their designated MTC of Alder Hey.

Pre-Hospital Services

Pre-Hospital Care is provided by the North West Ambulance (NWS) and the North West Air Ambulance Service (NWAA). In addition, on the borders of the NW region there are the East Midlands Ambulance Service, Royal Air Force, Welsh Ambulance Service and the Great North Air Ambulance. The service also works with the North West Transport Service to provide advice and support for transfer of critically ill children across the region. Voluntary services working within the Greater Manchester area include Hazola which is a charity-based service for the local Jewish community they have links with NWS and access to NWS Advanced Clinical Paramedic's for advice. All the volunteers are trained to Emergency Medical Technician Level 2.

Children's Major Trauma Centre's (MTC)

RMCH and AHCH are 2 of the 16 MTC's in England that are designated to treat children. The two children's MTC's work collaboratively with its wider network of service providers to ensure children with MT injuries are cared for at the right place, at the right time with the right care.

Children's Trauma Units / Local Emergency Hospitals

There are 15 children's TU's for children which are shown in the table below which transfer children to their allocated MTC (AHCH or RMCH). The Network also has 11 Local Emergency Hospitals (LEH). Leighton Hospital and Royal Stoke Hospital are part of the EAST Midlands MT Network however children experiencing MT injuries within their regions are on occasions transferred to AHCH due to its closer proximity to the TU's. Each hospital across the Network has a designated MTC as part of their trauma pathway.

Area	Hospital Transferring to Alder Hey Children's Hospital Major Trauma Centre
Cheshire and Mersey and Isle of Man	<ol style="list-style-type: none"> 1. Countess of Chester (TU) 2. Southport and Ormskirk (TU) 3. Whiston Hospital (TU) 4. Warrington Hospital (TU) 5. Wirral Hospital (TU) 6. Nobles Hospital, Isle of Man (LEH)
North West Midland and North Wales	<ol style="list-style-type: none"> 1. Leighton Hospital (Mid Cheshire NHS Trust) (TU) 2. Royal Stoke Hospital (North Staffordshire Only) (TU) 3. Wrexham Maelor Hospital (LEH) 4. Ysbyty Gwynedd, Bangor (LEH) 5. Glan Clwyd Hospital, Rhyl (LEH)
Lancashire and South Cumbria	<ol style="list-style-type: none"> 1. Furness General, Barrow (TU) 2. Royal Lancaster Infirmary (TU) 3. Blackpool Victoria Hospital (TU)

Area	Hospital Transferring to Royal Manchester Children's Hospital Major Trauma Centre
Lancashire and South Cumbria	<ol style="list-style-type: none"> 1. Royal Preston Hospital (TU/Adult MTC) 2. Blackburn Royal Infirmary (TU) 3. Chorley and South Ribble Hospital (LEH) 4. Burnley General Hospital (LEH)
Greater Manchester	<ol style="list-style-type: none"> 1. Stockport NHS Trust (TU) 2. Royal Oldham (TU) 3. Royal Albert and Edward (TU) 4. Salford Royal FT Trust (TU/Adult MTC) 5. Wythenshawe Hospital (TU) 6. Fairfield Hospital, Bury (LEH) 7. North Manchester General Hospital (LEH) 8. Royal Bolton Hospital (LEH) 9. Tameside Hospital, Ashton under Lyne (LEH) 10. Macclesfield General Hospital (LEH)

Governance Structure

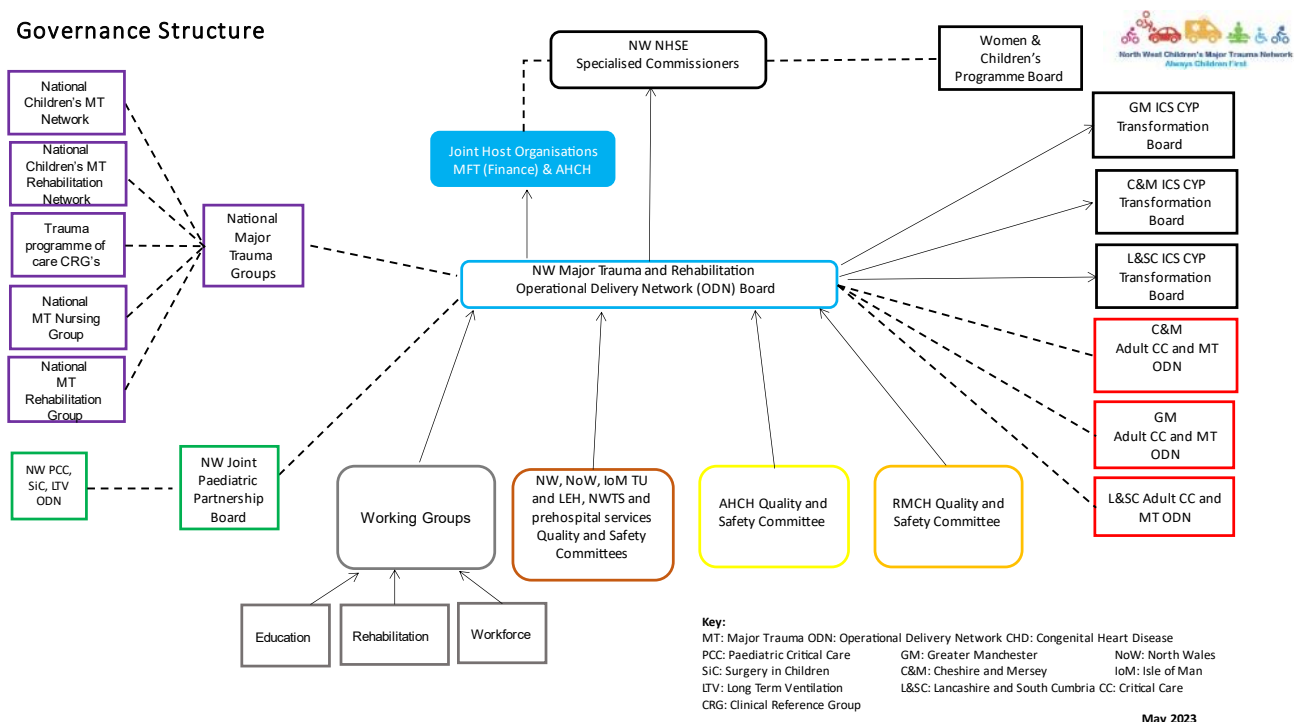
The Network has an established governance structure with good stakeholder engagement at the quarterly ODN Board Meeting. The Network is accountable to the NW NHSE Specialised Commissioners. The Network has established strong links with the regional adult MT ODN's and the Paediatric Critical Care, Surgery in Children and Long-Term Ventilation ODN (PCC SiC LTV ODN).

The Network leads nationally on the Children's MT National Network and Children's MT Rehabilitation Network. These networks are unfunded and feed into the mandated Trauma and Burns Programme of Care Clinical Reference Group.

The Network also feeds into the National Major Trauma Nursing Group and National MT Rehabilitation Groups. These groups lead on trauma education and standards of care and are non-mandated.

Moving forward the Network needs to establish closer working links with the newly formed Integrated Care Boards (ICB's) of Greater Manchester, Lancashire and South Cumbria, and Cheshire and Mersey as the financial envelope for the Network moves over in 2024.

Governance Structure



Network Maturity

The Network has continued to mature over the past year with governance and structure increasing from 3 to 4 in 2023 due to the recruitment of the new independent chair. The Network has established strong links with the 3 regional adult MT ODN's and the PCC SiC LTV ODN.

Knowledge capture and reuse, and learning and improvement will increase in 2023 as the Network develops its education strategy which will align with the updated clinical guidelines. It is planned that as this work progresses the network will mature on both these areas.

Purpose And Direction	Governance & Structure	Leadership & Facilitation	Knowledge Capture & Reuse	Integrity & Vitality	Learning & Improvement	Impact & Value	Sustainability & Renewal
4	4	4	3	4	3	4	4

Team Structure

A newly appointed Network Manager was appointed in 2022. In early 2023 the Network recruited a new lead nurse. In June 2023 the team recruited an independent chair. This takes the team to full establishment. See table below.

Role	WTE	Post vacant/filled	Permanent/fixed secondment	Start date	End date of post
Network Manager	0.5	Filled	Fixed term	June 2022	Awaiting confirmation of ongoing funding
Lead Nurse	0.5	Filled	Secondment	Jan 2023	Awaiting confirmation of ongoing funding
Clinical Lead	0.05 (2 hours per week)	Filled	Fixed term	April 2012	Awaiting confirmation of ongoing funding
Clinical Lead	0.05 (2 hours per week)	Filled	Fixed term	April 2012	Awaiting confirmation of ongoing funding
Project Support	0.4	Filled	Fixed term	Jan 2022	Awaiting confirmation of ongoing funding
Independent Chair	0.01 (30 minutes per week)	Filled	Fixed term	June 2023	Awaiting confirmation of ongoing funding

Budget- End of financial year 2022/2023

Below is the end of year budget statement.

2022/2023- Month 12	YTD plan	YTD actual	YTD variance	Annual plan	Annual forecast spend	Annual forecast variation
Income	£0	£0	£0	£0	£0	£0
Costs – pay	£91,516	£81,149	£10,367	£91,516	£81,149	£10,367
Costs – non-pay	£0	£9,885	(£9,885)	£0	£9,885	(£9,885)
Costs sub-total	£91,516	£89,035	£481	£91,516	£89,035	£481
Total	£91,516	£89,035	£481	£91,516	£89,035	£481

Risk Register

Below are the top 5 risks for the Network and the mitigations to reduce the risks. Risks are reassessed yearly by the Network in the Quarterly Governance Board meeting.

Ref:	Risk	Date Risk Identified	Mitigating Actions	Likelihood	Impact	Risk
				(1-5)	(1-5)	Rating
1.	If major trauma patients are not transferred to the MTC (and remain in DGHs) then the patient may not have access to appropriate specialities/investigations and rehabilitation services in a timely manner resulting in poor patient outcomes and delayed recovery	Mar-12	<ul style="list-style-type: none"> Monitor children ISS >15 not transferred to MTC – review all cases at regular intervals 	3	3	15
2.	If the trauma pathway is not followed correctly then there may be a delay in transfer to the Children's MTC. This may result in clinical assessments/investigations not being performed in accordance with MT standards. There may be increased transfer in activity over the summer period.	Mar-12	<ul style="list-style-type: none"> Ensure that all TUs have the MT Transfer in Guideline in ED Review cases at the MTC incident meetings and Network Manager to feedback to the Network. Peer reviews of all TU's throughout the Network by Children's MT Network Leads. 	3	4	12
3.	If the TU/LEH's have decreased numbers of trauma patients admitted to their department due to the implementation of the major trauma network this may result in the practitioners becoming deskilled in the treatment of major trauma incidents.	Mar-14	<ul style="list-style-type: none"> Regular Paediatric Simulation to be developed on each TU site. 	3	5	15
4.	If patients are not identified as major trauma cases (i.e., non-accidental injuries) then the Emergency Department MT pathway may not be followed affecting patient care this may result in clinical assessments/investigations not being performed in accordance to MT standards.	Jun-12	<ul style="list-style-type: none"> On-going work including scenarios and additional guidance has been introduced to ED/PED staff to increase awareness of TARN/ISS to mitigate the risk. Data received from TARN to identify patients who have remained at their DGH with an ISS of >9. These patients are investigated as part of the MT Governance Group. NWAS representative to attend ODN Board meetings to enable feedback of incidents. 	4	4	16
5.	If prehospital ambulances are not available for time critical transfers from trauma units/local emergency hospitals, then patients will not receive timely trauma care resulting in a delay in assessment and treatment of life-threatening injuries	Mar-18	<ul style="list-style-type: none"> Monitor incidents and address through liaison meetings with NWAS 	3	4	12

Peer Review of Regional Trauma Units

In 2022/2023 the Network has supported the Cheshire and Mersey, Greater Manchester, and Lancashire and South Cumbria Adult Major Trauma ODN's to peer review the TU's across the region. Each TU was tasked with performing a self-assessment against the National TU Service Specification. Members of the regional adult MT ODN and NW

Children's MT ODN completed a site visit and reviewed their performance and compliance against the National standards, recording any immediate risks, serious concerns, concerns and areas of good practice.

Reports for the reviews are currently being compiled.

Across the region 3 common concerns have been highlighted for paediatric trauma:

- Level 2 paediatric trauma nurse training
During the pandemic some TU's have struggled to access the Advanced Paediatric Life Support courses. This has caused units who do not run internal courses to be noncompliant with this MT TU standard
- Level 1 paediatric trauma nurse training
Although some units are running inhouse level 1 courses the majority of units do not currently have an inhouse program
- Paediatric rehabilitation
The majority of the units are not completing rehabilitation prescriptions for the retained paediatric patients and have limited access to paediatric inpatient rehabilitation services. This results in children retained in the TU's not having equitable access to services post MT injury than those children who are admitted to the MTC's.

The network has adapted its work program to prioritise nurse education and rehabilitation pathways across the region in 2023/2024.

The network will peer review both children's MTC's in June 2023.

Appointment Independent Chair

The Network are proud to introduce their new independent chair, Rachel Isba. Rachel is Professor of Medicine at Lancaster University and Consultant in Paediatric Public Health Medicine, Alder Hey

Research and Audit

Published Research – Manchester Needs Tool for Injured Children (and young people) (MAnTic)

The MAnTic has been designed by Dr Samantha Jones to assess the holistic needs for all types of childhood injuries. The MAnTic is a feasible, acceptable, valid self-reported measure of the needs of injured children and their families. Dr Samantha Jones worked across the ODN collecting data from both MTC's. The MAnTic is now available for use with patients.

The Network will look at how it can utilise the MAnTic to start to collate the needs of MT patients across the region. This will support a gap analysis for service provision and help to develop the work program for the rehabilitation strategy.

See link <https://pubmed.ncbi.nlm.nih.gov/36872874/>

Research Studies

The Network MTC's are involved in multiple research studies. These include:

- SWIFT 2023-2025: looking at early blood transfusion with NWAA and NWAS
- Paediatric Surgical Blast Study-An exploration of the essential functions of a paediatric major trauma unit responding to a mass casualty event
- ST Splenic Sparing 2020
- Starship Study - Trends in auto-regulation in Severe Head Injury in Paediatrics
- From in-situ simulation to beyond: improving paediatric trauma care.

Members of the Network attend local and national meetings which look at research proposals.

Children's MT Network Guidelines

In March 2022 the Network held a Stakeholder event to engage MT specialty leads to review the current Network MT Clinical Guidelines. Following the event subgroups were developed to look at each section of the guideline within their own specialty this included, reception and resuscitation, neurosurgery, paediatric general surgery,

spinal, burns and plastics, and safeguarding. The specialties came together to update the guidelines in conjunction with current NICE and BOAST guidance. The guidelines will be uploaded onto the Network website in individual sections so that they are easy to access for clinicians.

The guidelines are currently undergoing ratification and will be available to all MT Stakeholders in the coming months to launch within their organisations

Education

The Network has designed and collaborated on education events both regionally and nationally.

Paediatric Trauma Simulation Course



In April 2023 alongside the Paediatric Blast team, the ODN organised the first paediatric trauma simulation course. The course allowed clinicians and nurses from across the region to work together to enhance their knowledge and skills in paediatric major trauma.

The Network funded the course using the facilities at Alder Hey Children's Hospital. Candidates were invited from the North West, North Wales and the Isle of Man to attend.

19 candidates attended with positive feedback from all. The Network plan to develop the course for TU's to provide inhouse paediatric trauma training with a future course planned in the autumn

National Children's Major Trauma Rehabilitation Network Event

In April 2023 the National Children's Major Trauma Rehabilitation Network held a hybrid event in Manchester and online. Over 100 delegates attended from MTC's and charities across the United Kingdom.

The events focus was the acute rehabilitation of CYP and their families following a brain injury and spinal cord injury.

The event was a collaboration between:

- NW Children's Major Trauma ODN
- Sheffield Children's Hospital
- Birmingham's Children's Hospital
- Child Brain Injury Trust

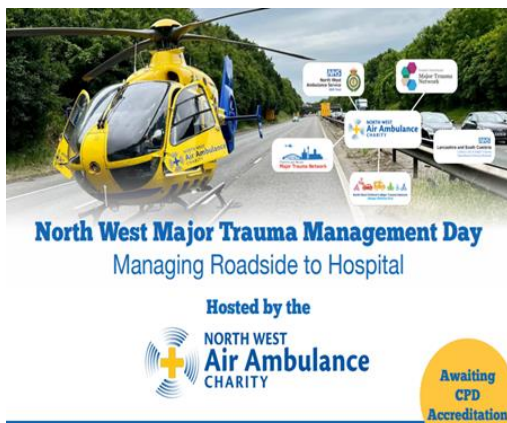


NW MT Management Day

In May 2023 the North West Major Trauma Management Day- Managing Roadside to Hospital was attended by over 500 delegates.

This event was hosted by NWAA in collaboration with:

- NWSAS
- Lancashire & South Cumbria Adult Major Trauma ODN
- Cheshire and Mersey Adult Major Trauma ODN
- Greater Manchester Adult Major Trauma ODN
- NW Children's Major Trauma ODN



The event focused on:

- Patient stories
- Learning about current research
- Education
- Public health and the developments in violence reduction.

Deprivation

The health impacts of growing up in poverty are significant and follow children across their life span. The North West region has some of the highest rates of deprivation in England. The North West has 4 local authorities in the top 10 most deprived areas for Income Deprivation Affecting Children Index (IDACI).

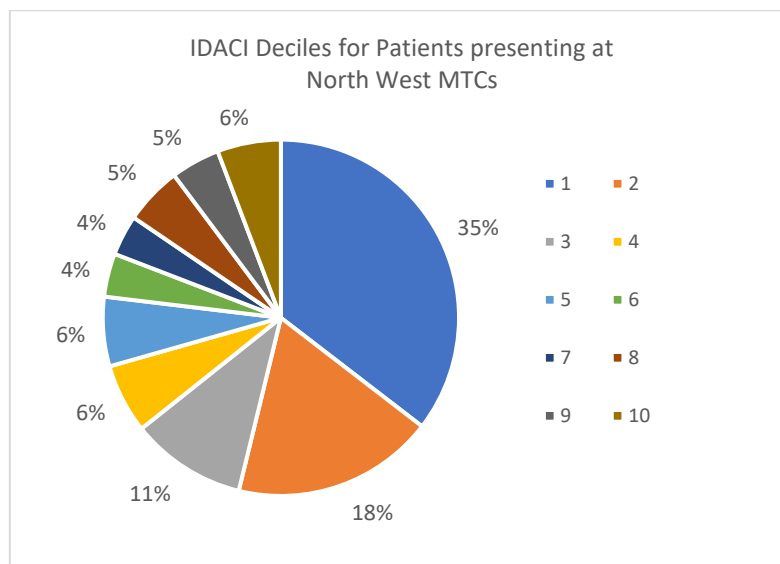
Rank (England)	Local Authority Deprivation affecting Children Index (IDACI)	Proportion of children living in income deprived households
2	Blackpool	30.7%
3	Knowsley	30.3%
4	Liverpool	29.9%
7	Manchester	29.7%

The NW region (20/21) has the:

- Highest regional hospital admission rates for deliberate and unintentional injuries for children
- Highest regional hospital admission rates for deliberate injuries for children 0-14 years
- Second highest Infant Mortality Rates (4.3) in England.

Children from the most disadvantaged families are far more likely to be killed or seriously injured due to accidents and children from the most deprived areas have hospital admission rates 45% higher than children from the least deprived areas.

(<https://ukhsa.blog.gov.uk/2017/02/28/preventing-accidents-in-children-under-five/>)

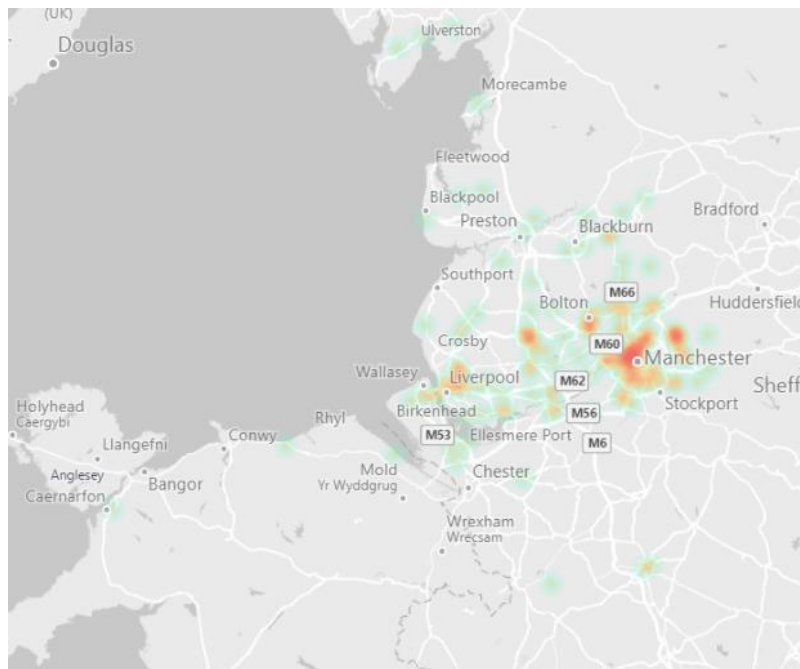


English indices of deprivation 2019
Data Source: <https://www.gov.uk/>

For children admitted to the MTC's in the North West 64% lived in postcodes in the top 3 deciles for Deprivation affecting Children (patients admitted who lived outside of England were unable to be included in this data collection).

To support families both MTC's in the Network have access to benefit and financial advice via the Major Trauma Signposting Partnership. This service provides free bedside advice and support to major trauma patients and their families. This reduces stress and anxiety around worries which may include housing, financial, employment or legal issues.

The map below shows the trauma incident heat map for children admitted to both MTC's in 2022. Incidents of major trauma occur more frequently in urbanised, highly populated areas.



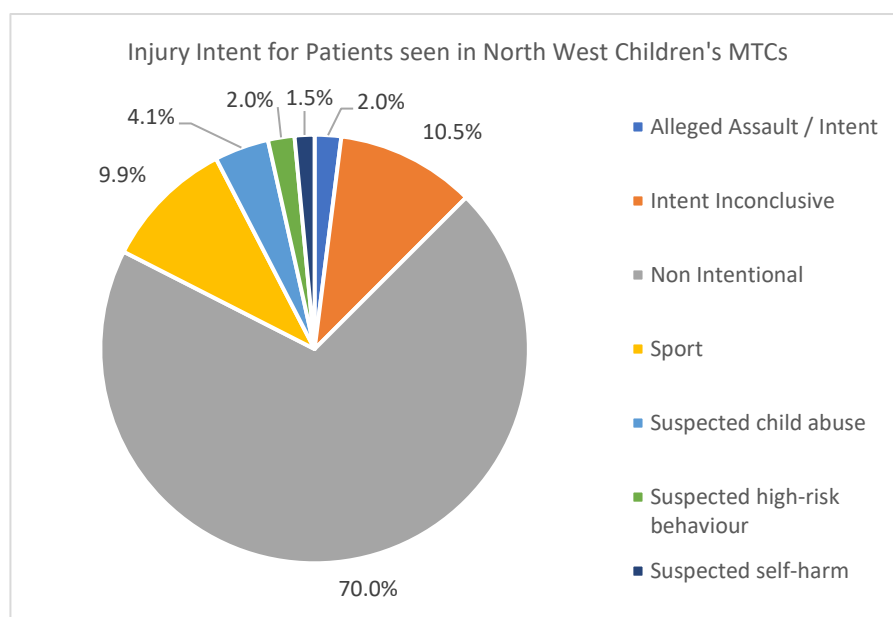
Trauma Incident Heat Map

Safeguarding

Post the covid pandemic the trauma coordination teams at the MTC's have experienced increasing complexities in the psychosocial needs of children young people (CYP) and their families affected by MT injury.

20% of the CYP admitted to the MTC's had a safeguarding need due to their mechanism of injury. Whether this was due to:

- Suspected child abuse
- Alleged assault / intent
- High risk behaviours
- Intent inconclusive



These figures reflect those seen by the Greater Manchester MT School Reintegration Service's data. The Greater Manchester MT School Reintegration Service have quantified the psychosocial needs of the children and their families that they support to return to school following injury.

- 37% of CYP had pre-existing learning or behavioral needs
- 16% were awaiting a diagnosis or were diagnosed with autistic spectrum disorder or attention deficit hyperactivity disorder
- 22% had pre-injury support from social services
- 19% required new social care input after injury

The coordinators work closely with the safeguarding teams in the tertiary centres and local children's services to ensure children and families receive the post discharge social support they require.

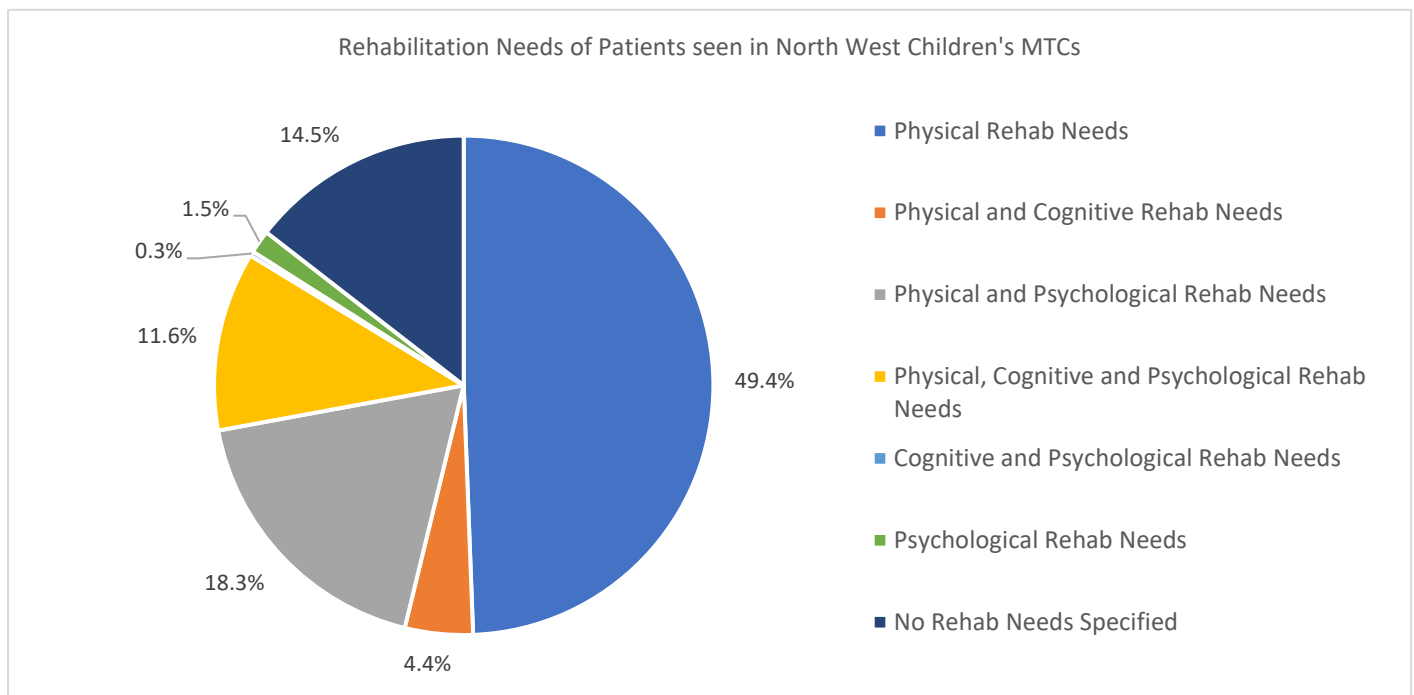
As part of the work plan the Network will bring together the data for injury prevention, deprivation and safeguarding to target vulnerable populations across the region.

Rehabilitation

Rehabilitation Prescriptions

Across the Network the MTC's have a high rate of completion of rehabilitation prescriptions with an average of 99% completion across both centres which is above the national average of 92.9%. The rehabilitation coordinators in both MTC's provide a key role in ensuring a holistic assessment of needs is completed. This ensures that a coordinated inpatient rehabilitation and discharge plan is developed with comprehensive arrangements for the continuation of care in the community.

Each patient's rehabilitation needs are assessed by the coordinators. The majority of CYP admitted to the MTC's had a physical rehabilitation need (49.4%) following their MT injury this was followed by physical and psychological rehabilitation needs (18.3%). 31.7% were documented as having a psychological need following their injury.



Rehabilitation After Traumatic Injury NICE Guideline [NG211]

In January 2022 NICE published their Rehabilitation after traumatic injury; NICE guideline [NG211]. This guidance covers the complex rehabilitation needs of all age patients after traumatic injury including:

- Assessment and goal setting
- Rehabilitation plans and programmes
- Physical, psychological, and cognitive rehabilitation
- Coordination of rehabilitation in hospital, discharge and in the community
- Commissioning and organising rehabilitation services.

The 300 recommendations apply to MTC's, Trauma Units, LEH's and community settings relating to the care of the patient and their family/carers.

Of the children retained in TU's 60% did not receive a rehabilitation prescription. Following the TU Peer Reviews, it is evident that a high percentage of the units do have access to the rehabilitation services that children/young people (CYP) require following a MT injury. At present children presenting to the regional MTC's have access to specialist therapy services and rehabilitation coordination however those retained in their local hospital don't have access to the same level of specialist inpatient services including:

- Psychology
- Speech and language
- Occupational therapy
- Rehabilitation coordinators
- Legal and financial advice

In the 2023/2024 workplan the Network will assess the regional paediatric MT rehabilitation services against the NICE recommendations. To support the region the Network will also develop MT rehabilitation guidelines which will align with the NICE guidance. This document will support units to develop their rehabilitation services to ensure equity of access to services across the region and improve outcomes for CYP following traumatic injury.

School Reintegration

A major trauma injury can impact children's physical and psychosocial wellbeing, access to education and the family's employment and financial status.

Vocational rehabilitation is recognised across adult rehabilitation services, however for CYP there are limited services that provide support for them to return and access education. The MT Coordination services across both MTC's support CYP to reintegrate back into education, they link in with the education provider and often universal health and social services on discharge from the MTC. Due to capacity of the MTC coordination teams ongoing post discharge support is limited. Many of the children affected by major trauma injury may not trigger universal health services on discharge despite having an injury which will impact on their activities of daily living for example a mild to moderate brain injury.

Lt. Col. Dave Roscoe - Defence Medical Services (2018) completed a Health Needs Assessment focusing on rehabilitation delivered in schools and learning opportunities following the Manchester Arena Bombing.

The key findings were:

- Traumatic injury and medical complications have a negative impact on educational participation and attainment.
- Educational re-integration and re-attainment must be seen as a measurable clinical and rehabilitative outcome.
- In the aftermath of the MEN-attack services went 'the extra mile' to ensure barriers to re-integration and recovery were removed.

The report made the following recommendations:

- Communication should be improved between health and education professionals
- Development of the school's rehabilitation facilitator role (SRF) to support school transition after traumatic injury
- Development of the fit note to aid communication between health and education

Dr S Jones (2023) (Manchester Foundation Trust Post-Doctoral Clinical Academic Fellow) completed research in partnership with the Network, Children's National Major Trauma Network, and injured children and their families. The aim of this research was to understand the needs of injured children and their families and develop a valid tool to measure them. The research concluded that injured children require ongoing support after hospital discharge to ensure they return to education and reach their full emotional, social, physical, and vocational potential.

In 2019 the Greater Manchester (GM) Children's Rehabilitation Project received 2 years funding from the 10 Greater Manchester Clinical Commissioning Groups to provide vocational rehabilitation to support children and young people to return to education following major trauma injury. Following the success of the 2-year pilot the team have been funded via the block contract.

The project developed the SRF service which provides a holistic needs assessment to support CYP to return to school, they provide a school fit note (see appendix 1), attend school MDT's meetings, peer talks, access school transport and offer advice and training to teaching staff to meet the needs of the CYP. The service has improved school attendance following MT injury, communication between carers, health care and education, supported families to access to psychological support, social care, therapy, and healthcare appointments post discharge. The service was shortlisted as a finalist in the 2022 Health Service Journal Awards.

This service is only currently only available to CYP affected by trauma in the GM region. The Network as part of the rehabilitation work plan will work with services across the region to look how school reintegration can be accessed by all children impacted by a major trauma injury across the region.

Injury Prevention

The Network has been linking in with a public health professional across the North West to look at ways it can work collaboratively with agencies to address the issues around injury prevention. The Network holds invaluable data around what causes the most serious life threatening and life changing injuries. The Network is looking at ways it can share data to help focus injury prevention programmes across the region.

The Network leads on the National Children's Major Trauma Network. This Network has injury prevention as one of its core aims. Nationally this Network has focused on non-accidental injuries, button battery / magnet ingestions, and crush injuries.

There is a strong link between injury and deprivation. With high numbers of children across our region living in the top 3 deciles of deprivation this will help us target populations for our injury prevention strategy.

The Child Accident Prevention Trust list a number of reasons why children in deprived areas are more at risk of injury these include:

- Unaffordable safety equipment
- Buying cheaper products that don't comply with safety standards
- Literacy
- Limited extended family support
- Maternal depression
- Risk-taking behaviour by young people
- Homelessness or living in overcrowded homes
- Lack of car ownership
- Living on streets that drivers use as 'rat runs' to avoid congestion on main roads

(Link for further information:

<https://capt.org.uk/capt/safety/advice/#:~:text=Poorest%20children%20at%20most%20risk,to%20hospital%20with%20serious%20injuries>)

Violence Reduction

There are a range of factors that increase the risk violence and its occurrence in people's lives, these include:

- Living in a household with domestic abuse
- Adverse childhood experiences
- Neglect, sexual and physical abuse
- Poor and inadequate housing
- Substance abuse (including alcohol)
- Poor mental wellbeing

Research tells us that violence shows one of the strongest inequality gradients, with emergency hospital admission rates for violence being around five times higher in the most deprived communities than in the most affluent (Bellis et al 2012). However, being a victim of violence can also lead to further violence and some victims can become perpetrators. It is important that services intervene early for at risk CYP.

Across the region the MTC's are seeing an increase in hospital admission for young people affected by violent crimes. A key focus for both MTC's has been to work and support the development of the regional violence reduction units. The focus of the violence reduction units are to support young people who have been exposed to or are at risk of experiencing violence in the future. Both MTC's involve the violence reduction teams in their MDT's. Violence reduction initiatives were presented as part of the Regional Northwest Major Trauma Management Day- Managing Roadside to Hospital.

E-scooters

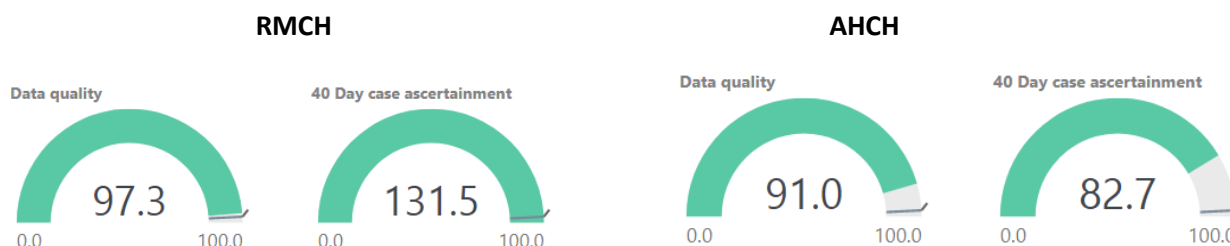
The Network has been involved in the Parliamentary Advisory Council for Transport Safety (PACTS) project, funded by The Road Safety Trust, investigating the extent of under recording of collisions involving e-scooters in the UK. The Network has seen an increase in the number of road traffic collisions involving e-scooters. Further work is to be completed across the region to look at how we can raise the awareness of the dangers of e-scooters and the legal issues surrounding their use.

Network Data

Network TARN Report

The Trauma Audit Research Network (TARN) provides and collates the data submitted by the MTC's and TU's across the region.

Data Quality



The data quality across the MTC's is varied with RMCH data's quality above national average and AHCH being below the expected standard.

AHCH have a new TARN data administration process. The Network will monitor the quality of the data submitted over the next 6 months to ensure improvement in compliance and confidence in the data.

Excess Deaths or Survivors

Outcome at 30 days or discharge

PS Band	Number in band	Observed Survivors	Expected Survivors	Difference*	TARN fraction	Ws	95% confidence interval
95 - 100	595	595	591.20	0.64	0.65	0.41	
90 - 95	17	16	15.68	1.89	0.17	0.32	
80 - 90	14	14	12.22	12.73	0.10	1.28	
65 - 80	11	8	7.87	1.18	0.04	0.04	
45 - 65	24	11	13.03	-8.46	0.02	-0.16	
25 - 45	9	4	3.16	9.30	0.01	0.13	
Total	673	650	643.15			2.05	-1.03 to 5.14

The Ws score for the Network is 2.05. Showing 2.05 excess survivors across the Network

Most Senior Doctor Within 5 Minutes of Arrival

Category	Total	Consultant	TARN average consultant	ST: 3+	< ST: 3	Not recorded
01 January 2022 to 31 December 2022						
All patients	182	139 (76.4%)	20.6%	9 (4.9%)	0 (0.0%)	34 (18.7%)
ISS > 15 patients	71	64 (90.1%)	32.5%	2 (2.8%)	0 (0.0%)	5 (7.0%)
Trauma team activated	47	40 (85.1%)	72%	1 (2.1%)	0 (0.0%)	6 (12.8%)
Trauma team not activated	135	99 (73.3%)	6.1%	8 (5.9%)	0 (0.0%)	28 (20.7%)

The Network are above the national average for the most senior doctor seeing the patients within 5 minutes of arrival, with 76% of patients seeing a consultant and 85% having a trauma team activated.

Median Time to First Operation

Patient category	n	Median minutes to operation*	TARN median minutes to operation
01 January 2022 to 31 December 2022			
All Patients	31	839 (322 - 1072)	696 (267 - 1072)
01 January 2021 to 31 December 2021			
All Patients	37	551 (305 - 947)	675 (256 - 1067)

The median time to first operation has seen an increase from 551 minutes to 839 minutes this is above the median TARN average. As part of the upcoming MTC peer reviews the Network will review this data and ask for reassurance that patients are accessing theatre in a timely manner in accordance with their clinical presentation.

Compliance with BOAST 4 Guidance

53% of BOAST4 patients received Surgical Stabilisation within the target of 24 hours, this is **above** the national average of 45%. This represents **no change** compared to previous year.

60% of BOAST4 patients received Soft Tissue Coverage within the target of 72 hours, this is **above** the national average of 51%. This represents **an increase of 10%** compared to previous year.

Fixation of soft tissue coverage for open long bone fractures within 72 hours across the Network has remained consistent and is above the national average. It is recognised that these figures although higher than the TARN average could be improved upon. The Network will review these pathways at the upcoming MTC peer reviews.

CT Scan within 60 Minutes

Patient category	n (CT with date and time rec)	Median minutes to*			TARN median minutes to	
		CT	Provisional report	Final report	CT	Final report
01 January 2022 to 31 December 2022						
All Patients	119	35 (20 - 72)	25 (0 - 47)	308 (114 - 940)	136 (51 - 297)	156 (72 - 597)
AIS 3+ Head Injury	51	34 (18 - 63)	30 (0 - 49)	308 (109 - 942)	98 (41 - 215)	153 (70 - 584)
NICE head injury criteria	16	27 (14 - 41)	30 (0 - 60)	171 (104 - 1038)	34 (23 - 61)	178 (82 - 608)

81% of NICE criteria patients had a CT scan with 60 minutes this is above the TARN average of 75%. 92% of patients had that CT within 60 minutes arrived within the hours of 08:00-20:00

Pain Management

THEMED section: Patients with 3+ rib fractures that were given pain relief*

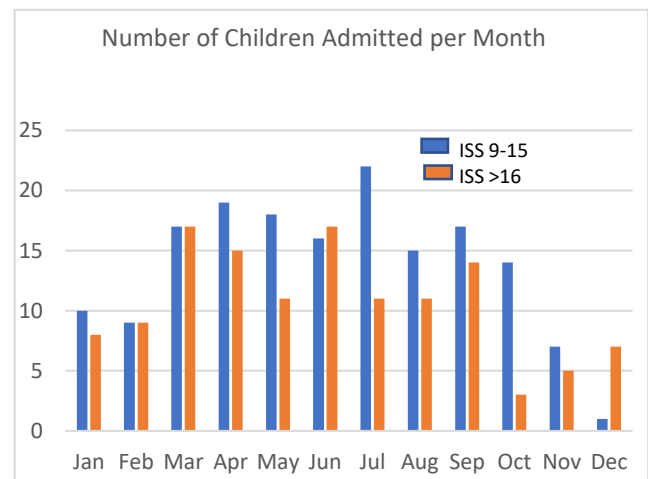
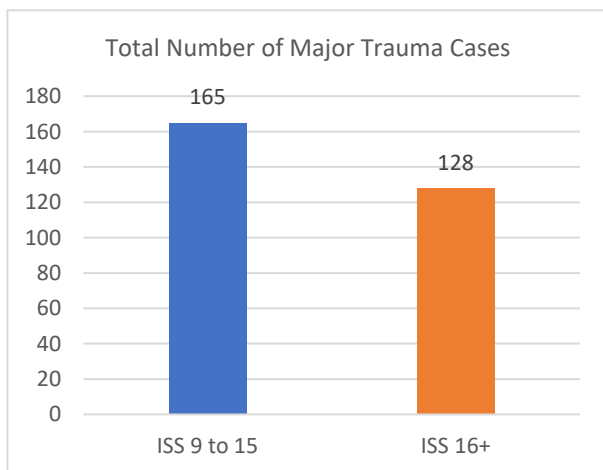
170 minutes median time to pain relief, this is **below** the TARN average of 325 minutes. This represents an increase of 127 minutes compared to previous year.

0% of patients were given pain relief pre hospital, this is **below** the TARN average of 24%. This represents an increase of 100% compared to previous year.

100% of patients were given pain relief in ED, this is **above** the TARN average of 71%. This represents an increase of 100% compared to previous year.

Pain management is linked to patient satisfaction. The data shows we are above national average for administration of pain relief in the emergency departments. For pre-hospital pain relief the Network is below the national average. This is likely a data recording issue. The Network will link in with pre hospital services around this measure.

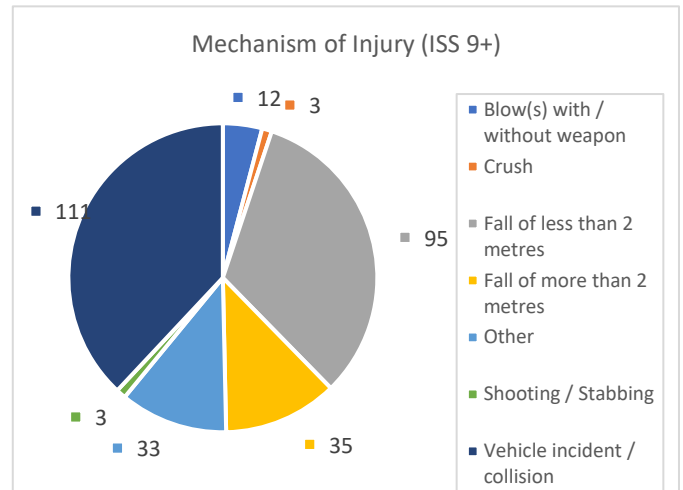
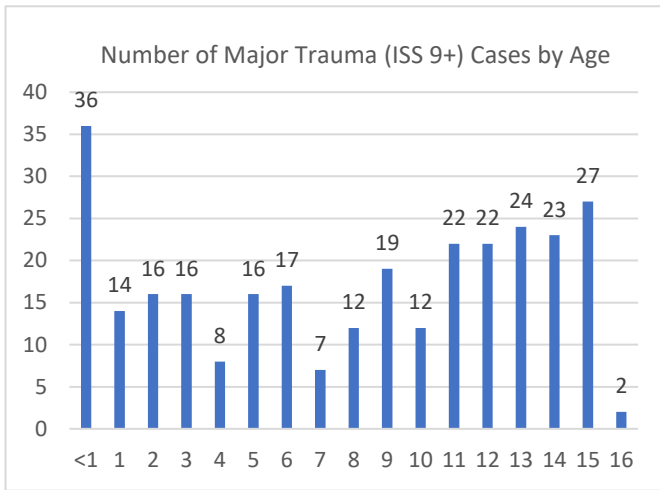
Total Number of Children Admitted to the NW Children's MTC's- January to December 2022



There has been a total of 293 children admitted to the NW Children's Major Trauma Centres in 2022 with an ISS of 9 and above.

It is usual for paediatric major trauma to peak in the summer months of May through to September however in 2022 we saw cases increase from March through to October.

Age and Mechanism of Injury of Children Admitted to the NW Children's MTC's- January to December 2022



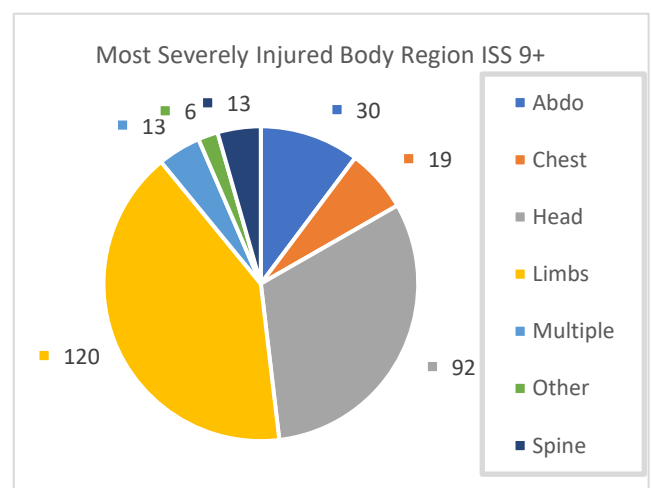
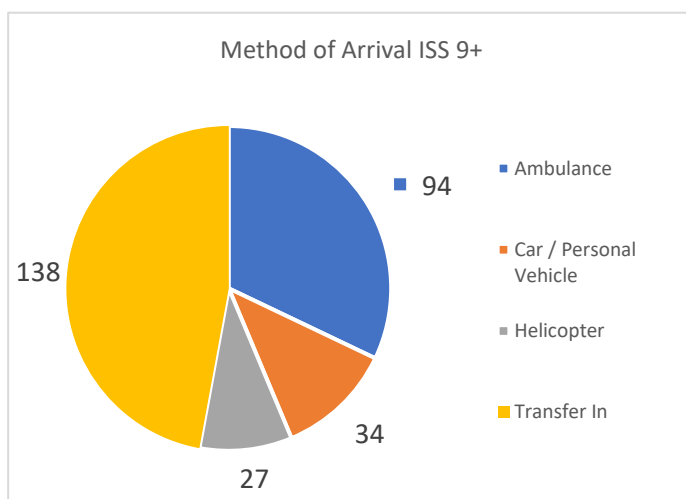
Vehicle incidents (38%) were the most common mechanism of injury followed by falls less than 2 metres (32%).

Children under 1 years old were the most common age range admitted into the MTC's.

The most common mechanism of injury for the age ranges were:

- Children under 1 years:
 - Fall less than 2 metres (46%)
 - Other (45%). This may be due to the high incidence of non-accidental injury in this age range. Full incident information maybe not be available due to ongoing investigations
- 1 -4 years:
 - Fall less than 2 metres (53%)
 - Fall over 2 metres (18%)
- 4-7 years
 - Vehicle collision (41%)
 - Fall less than 2 meters (29%)
- 7-11 years
 - Vehicle collision (45%)
 - Fall less than 2 metres (38%)
- 11-16 years:
 - Vehicle collision (55%)
 - Fall less than 2 metres (19%)

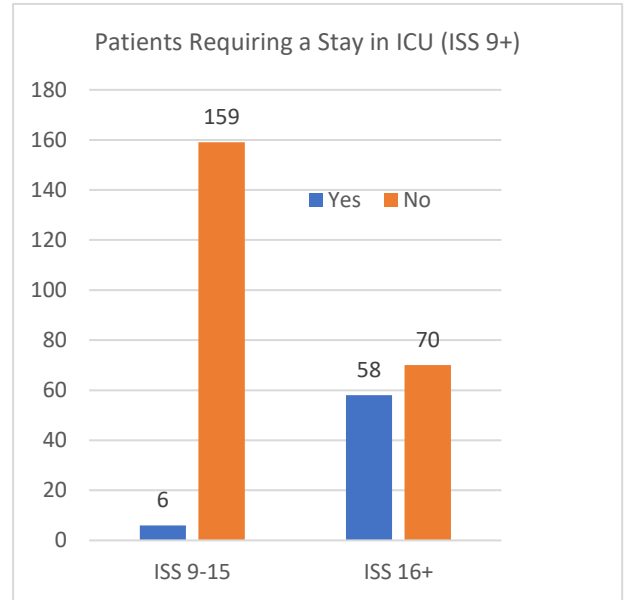
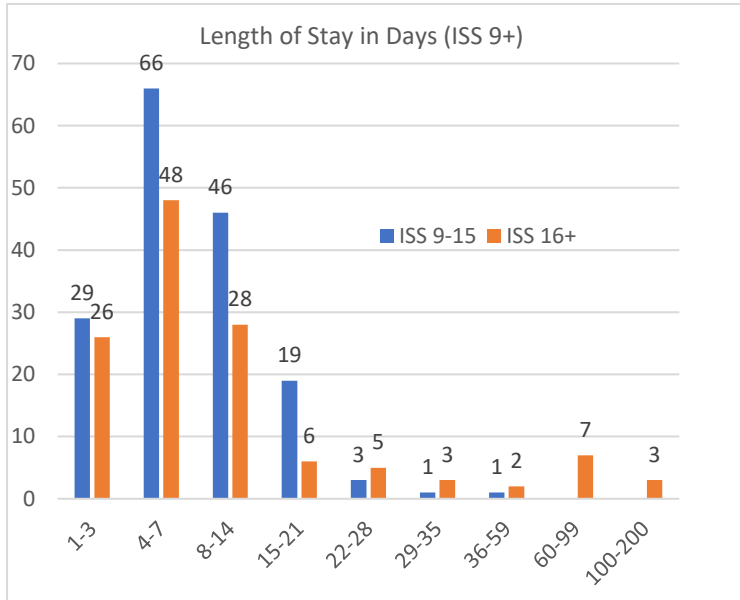
Method of Arrival and Most Severely Injured Body Region of Children Admitted to the NW Children's MTC's- January to December 2022



The majority of children admitted to the children's MTC's were transfers in from other hospitals (47%). 41% of children arrived direct via pre hospital services. 12% self-presented to the MTC.

Limb injuries were the most severely body part injured followed by head injuries.

Length of Stay and Numbers of Patients Admitted to Paediatric Critical Care for Children Admitted to the NW Children's MTC's- January to December 2022



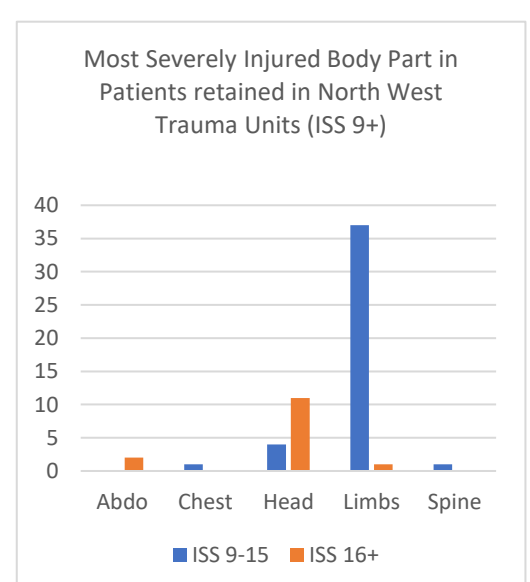
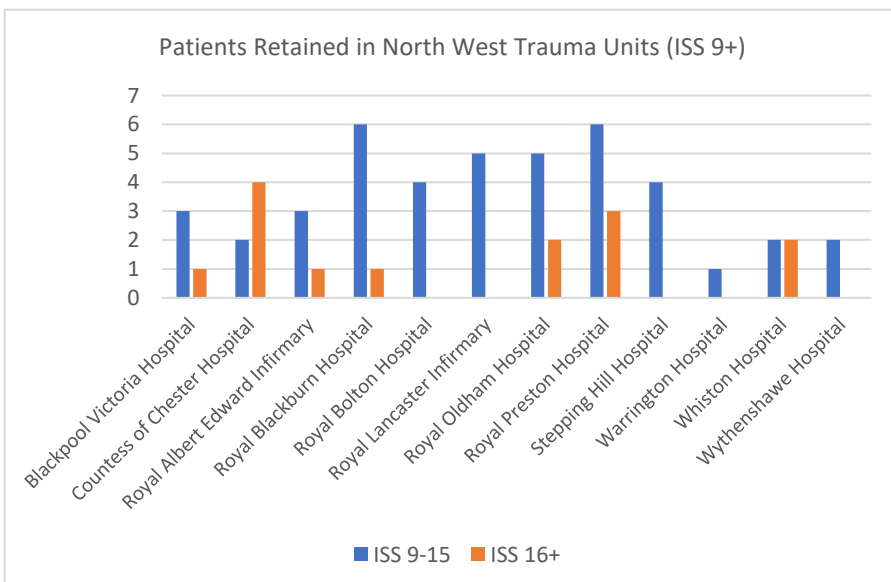
The average length of stay is 6 days of those with an ISS score of greater than 15 this is below the TARN average of 8 days

In both centres the majority of children are discharged within 2 weeks. For children with prolonged length of stays this could be due to many reasons including clinical need, rehabilitation, housing, child protection investigations and equipment.

Most children did not require a stay in paediatric critical care. Even those with higher ISS scores did not require this level or care

The average length of stay on paediatric critical care was 12 days which is the same as the TARN average.

Numbers of Children Presenting to Trauma Units and Local Emergency Hospitals



66% of children admitted to their local ED's with MT injuries across the Network self-presented with their parents/carers.

40% of the children presenting to their local hospital transferred out to their designated MTC.

60% of children presenting to their local ED in the Network remained in their local emergency hospital or trauma unit for definitive care and rehabilitation.

82% of the children who did not transfer into an MTC had an ISS 9-15; of those fractured femurs were the most common injuries (56% ISS 9-15). The Network recommends that fractured femurs are managed where clinically indicated in the local hospital setting. The Network are developing guidelines to support the care of patients with a fractured femur in the local hospital.

18% of the children who did not transfer into the MTC had an ISS >15. 79% of the ISS>15 patients who did not transfer to an MTC had sustained a head injury - Of which, 55% were under the age of 1 years, 36% were 1-5 years old, and 9% were over 5 years old.

For children who did not transfer into an MTC, the mechanisms of injury were as follows: 66% were falls less than 2 metres, 12% RTC's, 9% blow, 13% other cause.

Annual Work Plan 2023-2024

Assessment criteria	Red = Problem meeting criteria	Amber = Good progress made with work on-going	Green = Criteria fully met
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Major Trauma				
Objective	Plan	Time Frame		Lead
Network Organisation				
Public and patient engagement – children and families	PPV partner to be appointed onto Governance Board	Oct 2023		Network Manager
To ensure safe and equitable access to care across the ODN footprint	Network Clinical Guidelines to be completed and distributed across all stakeholders	June 2023		Network Manager
To ensure paediatric trauma care across the ODN footprint is equitable and best practice pathways across the network are in place that support improved patient flow	<ul style="list-style-type: none"> Partake TU Peer Reviews in collaboration with the Adult ODN's Peer review both Paediatric MTCs 	July 2023		ODN Team
Ensure close relationships maintained with the wider system during period of organisational change in the North West	<ul style="list-style-type: none"> New links to be made with new structures as they become operational to ensure pathways of care are maintained and improved. Engagement to be established with the ICB boards as financial envelopes handover 	March 2024		Network Manager
To ensure that the Network aligns with the new MT ODN Service Specification and NW NHSE ODN F2 Document	<ul style="list-style-type: none"> Once specifications are finalised Network manager to align Network with Regional and National specifications 	TBC-awaiting documentation to be finalised		Network Manager
To ensure that the ODN remains independent of key stakeholders	<ul style="list-style-type: none"> Appoint Independent Chair 	June 2023		Network Manager
To work alongside related networks, flexing use of resources to find efficiencies, target resources for best effect and share insight and experience.	<ul style="list-style-type: none"> To work with the adult MT ODN's To link with t24he relevant paediatric ODN's To align work programmes with the relevant ODN's 	June 2023		Network Manager

Monitor key indicators of quality across the network as required by commissioners and by the service and network specification e.g. national audit and quality dashboard.	<ul style="list-style-type: none"> To proactively review all individual and network level TARN clinical reports and dashboards and apply appropriate critique and support to aim to address in variances in performance below the national average To monitor paediatric trauma admissions across the Network Peer Review of TU's and MTC's 	March 2024		Network Manager
Assure and improve quality and safety, experience, and outcomes across the Network	<ul style="list-style-type: none"> To review incidents across the Network and share lessons learnt to all stakeholders Develop network incident report and governance framework 	March 2024		Network Manager
To develop network guidelines for femoral fracture management across the region that aligns with the GIFRT standards	<ul style="list-style-type: none"> Utilise TARN data to understand current pathways across the region Utilise BI data with the support of the NW NHSE BI team to compare against the TARN data Develop end to end pathways that ensure equitable access to care 	Dec 2023		Network Manager /Lead Nurse
Education				
Develop and agree a network education strategy that meets the needs of all stakeholders both in the delivery of care and in the functioning of the network.	<ul style="list-style-type: none"> Education strategy to be developed Lead nurse to assess gaps in education Lead nurse to review paediatric trauma education course across the region Nurse education level 1&2 courses to be developed Regional trauma simulation programme to be developed 	March 2024		Network Lead Nurse Network Clinical Leads
Rehabilitation				
To improve the pathway and outcomes for children affected by major trauma Injury	<ul style="list-style-type: none"> To engage commissioners to improve rehabilitation across the pathway To set up rehabilitation working group Develop Network Rehabilitation Guidelines to align with NICE Guidelines 	December 2023		Network Manager and Lead Nurse
Accident Prevention				
To develop an accident prevention strategy across the ODN footprint	<ul style="list-style-type: none"> Ongoing meetings with public health clinicians Identification of key themes using TARN data Links with key stakeholders to inform practice Accident prevention strategy to be developed for the Network 	Oct 2023		Network Manager and Lead Nurse
Assess services by relevant protected groups, deprived quintiles, inclusion groups, vulnerable groups, geography etc to identify vulnerable groups experiencing gaps in access, experience, and outcomes.	<ul style="list-style-type: none"> Utilise deprivation data and TARN data to identify at risk groups Identify how MT impacts vulnerable patient groups and impacts their outcomes Look at equitable access to services for vulnerable group 	March 2024		

Appendix 1

School Fit Note



Manchester University
NHS Foundation Trust

Fit Note for Return to School

(V1.7)

Name:		DOB:	
Address:			
School:		Year Group:	Year 3
Date of accident:	Click here to enter a date.	History of injury:	
Injury/injuries:	Limb	Pelvis/ Back	Other
	None	Back injury	No
Summary			
Aftercare:	Plan: Review by surgeons		
Medication:	Medication:	What for?	Required at school:
	Pain relief (paracetamol)		Maybe required
	Any other comments:		
Psychosocial:			
Thinking Skills:			
Walking Advice:	walking independently	Walking Aid:	None
Walking short distances:	Walking independently	Walking long distances:	
Additional comments:			
Stairs:			
Personal care/toilet:	Accessing a standard toilet independently	Additional comments:	
Transport to school			Advice:
Recommendations for school:	Can return to school fulltime: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Phased return over:	Individual advice:	
	Lessons moved to ground floor <input type="checkbox"/> Hall Pass <input checked="" type="checkbox"/> Lift Pass <input checked="" type="checkbox"/> Buddy System <input checked="" type="checkbox"/>		
Recommendations for return to PE:	Other:		
Signed:		Date:	
Key contacts:	Choose an item.		
Consent for fit note to be forwarded directly to SENCO and school nurse <input checked="" type="checkbox"/>			

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