



THE LONDON MAJOR TRAUMA SYSTEM

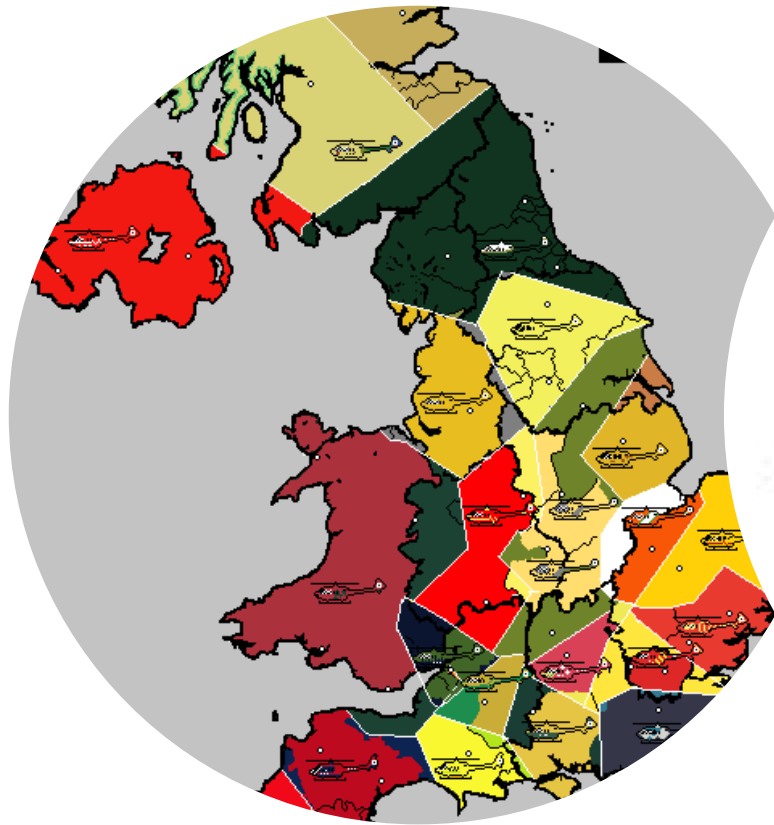
PRIORITIES, CHALLENGES & FUTURE DIRECTIONS

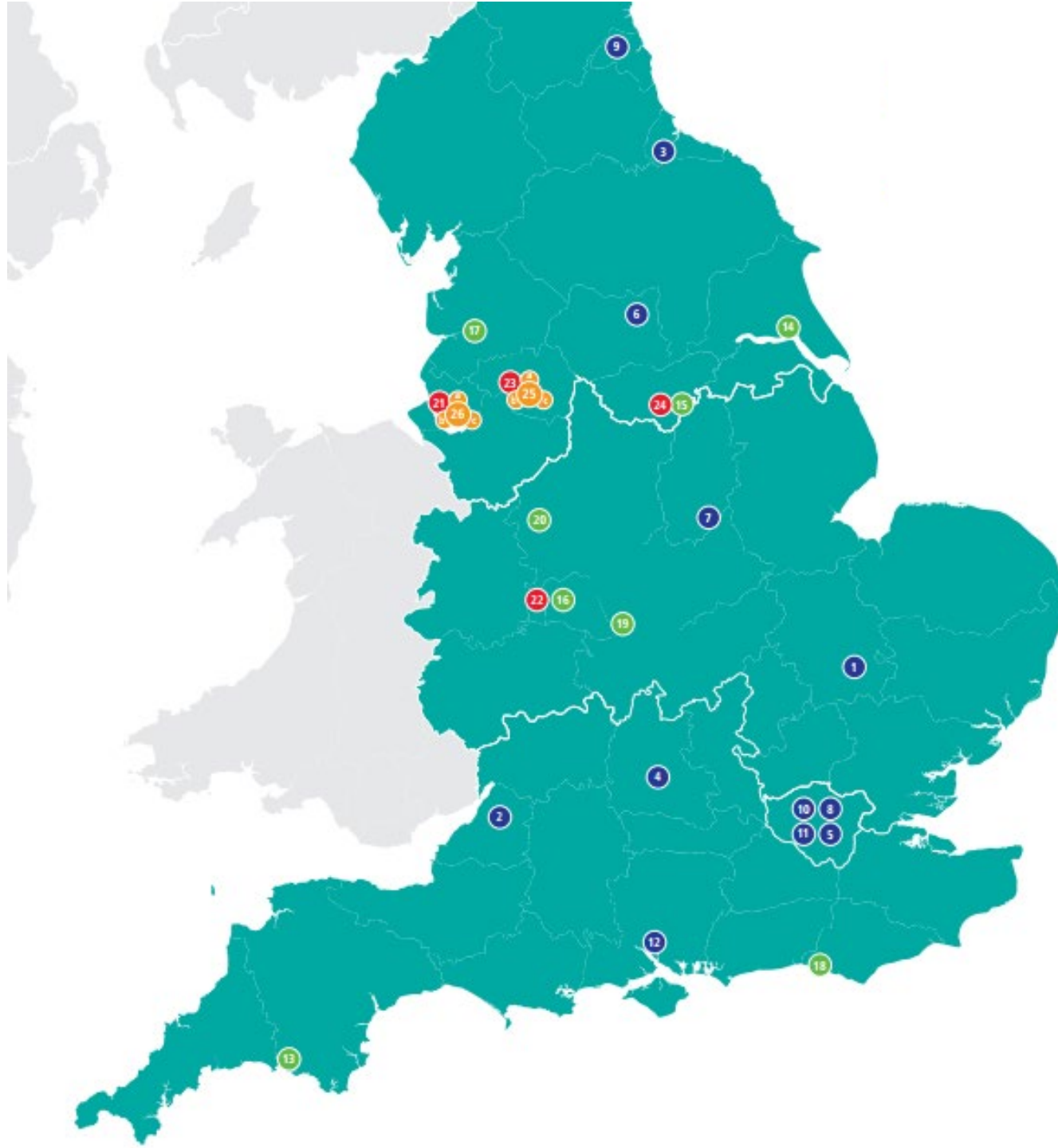
KARIM BROHI, FRCS FRCA

Director, London Major Trauma System

Consultant Trauma Surgeon, Royal London Hospital MTC

Professor of Trauma Sciences, Queen Mary University of London





Adult and Children's Major Trauma Centres

- 1 Addenbrooke's Hospital Cambridge
- 2 Frenchay Hospital Bristol
- 3 James Cook University Hospital Middlesborough
- 4 John Radcliffe Hospital Oxford
- 5 King's College Hospital London
- 6 Leeds General Infirmary
- 7 Queen's Medical Centre Nottingham
- 8 Royal London Hospital
- 9 Royal Victoria Infirmary Newcastle
- 10 St Mary's Hospital London
- 11 St George's Hospital London
- 12 Southampton General Hospital

Adult Major Trauma Centres

- 13 Derriford Hospital Plymouth
- 14 Hull Royal Infirmary
- 15 Northern General Hospital Sheffield
- 16 Queen Elizabeth Hospital Birmingham
- 17 Royal Preston Hospital
- 18 Royal Sussex County Hospital Brighton
- 19 University Hospital Coventry
- 20 University Hospital of North Staffordshire Stoke on Trent

Children's MTCs

- 21 Alder Hey Children's Hospital Liverpool
- 22 Birmingham Children's Hospital
- 23 Royal Manchester Children's Hospital
- 24 Sheffield Children's Hospital

Collaborative

- 25 Manchester Collaborative MTC
 - a) Salford Royal NHS Trust
 - b) Manchester Royal Infirmary
 - c) University Hospital South Manchester
- 26 Liverpool Collaborative MTC
 - a) Aintree University Hospital
 - b) Walton Centre
 - c) Royal Liverpool University Hospital

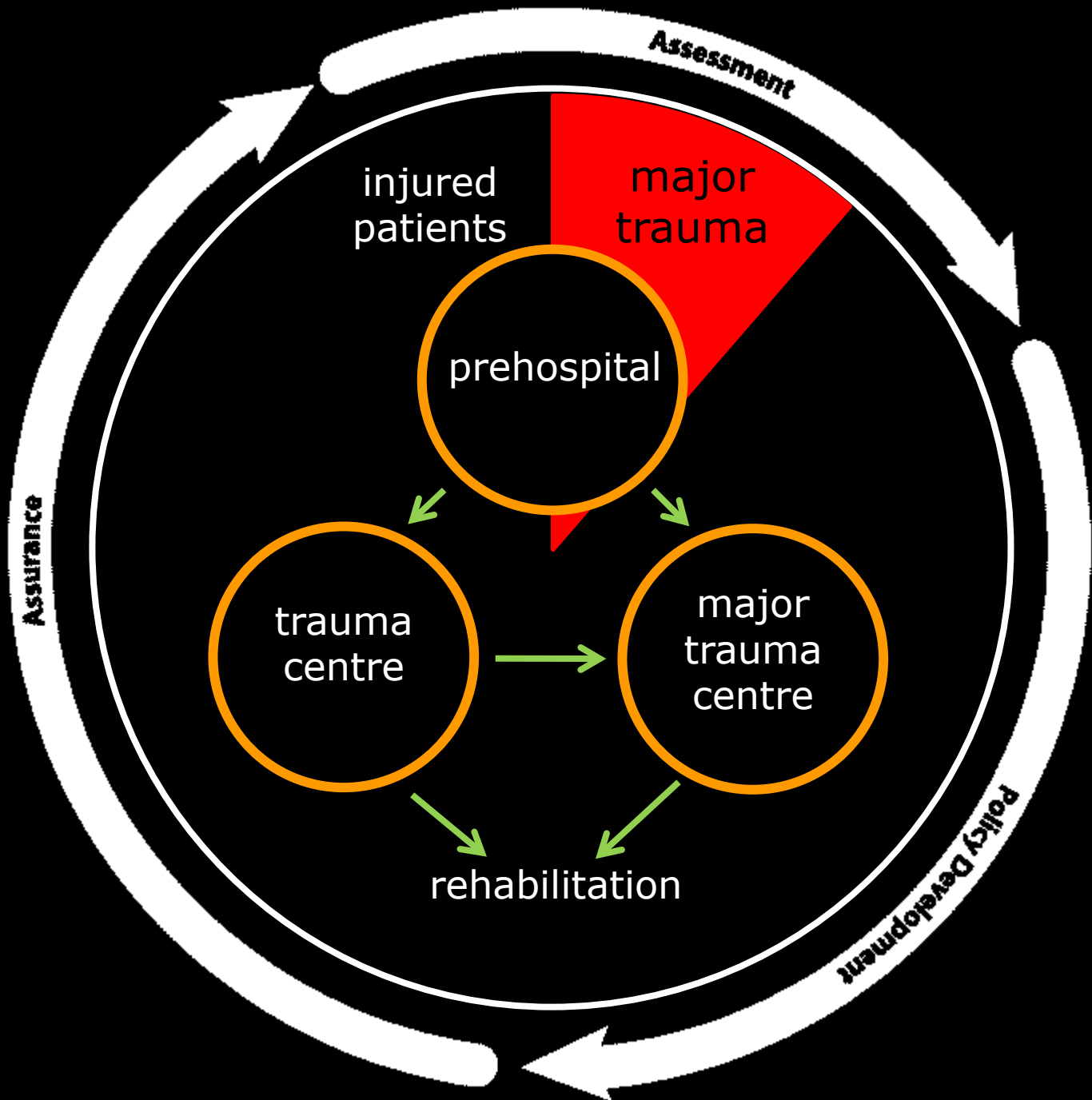
Major Trauma Networks

Operational Delivery Network for a Region

Major Trauma Centre (Level 1 equivalent)

Trauma Units (Level 3 equivalent)

Prehospital Providers



Federalised Governance



National Peer Review

Quality Surveillance Programme



Network Governance



MTC, TU & Prehospital Governance

Rate of Survival at this Hospital: Yearly Figures



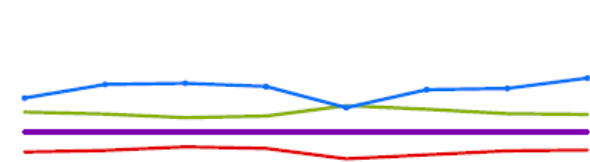
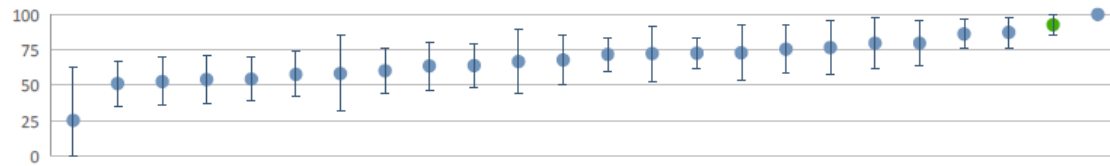
Rate of Survival Breakdown at this Hospital

| Survival band % | Number in group | Expected survivors | Actual survivors | Difference* | Adjusted difference** | |
|-----------------|-----------------|--------------------|------------------|-------------|-----------------------|---|
| 95 - 100 | 2551 | 2517 | 2528 | 0.4 | 0.3 | Unexpected deaths in minor/moderate injury Usually due to poor management of co-morbidity and/or complications |
| 90 - 95 | 441 | 409 | 412 | 0.6 | 0.1 | |
| 80 - 90 | 298 | 254 | 253 | -0.6 | -0.1 | |
| 65 - 80 | 179 | 131 | 125 | -3.6 | -0.1 | Unexpected survivors with more serious injury Usually indicates good initial resuscitation and the treatment of head injury in Neurological Centres |
| 45 - 65 | 125 | 68 | 72 | 2.7 | 0.1 | |
| 25 - 45 | 90 | 32 | 34 | 1.5 | 0.0 | |
| 0 - 25 | 84 | 10 | 19 | 10.3 | 0.1 | |
| Total | 3768 | 3424 | 3443 | 0.5 | 0.4 | |

System Indicators

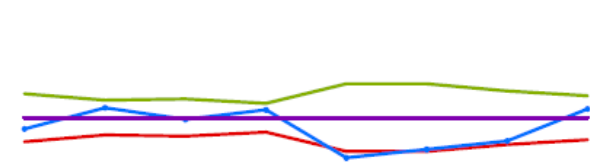
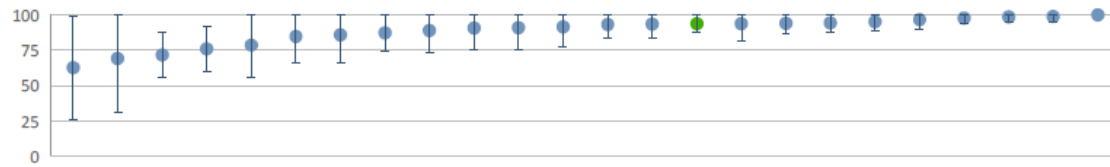
MTC 06 - MTCs deliver consultant led trauma teams ON ARRIVAL for patients with an Injury Severity Score greater than 15

| Period | Numerator | Denominator | Trust value (%) | National mean (%) |
|----------|-----------|-------------|-----------------|-------------------|
| 16/17 Q2 | 102 | 110 | 92.7 | 70.2 |



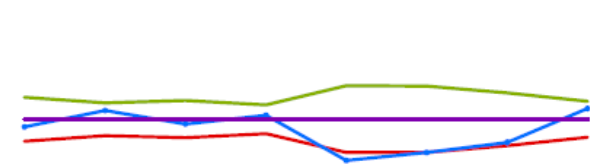
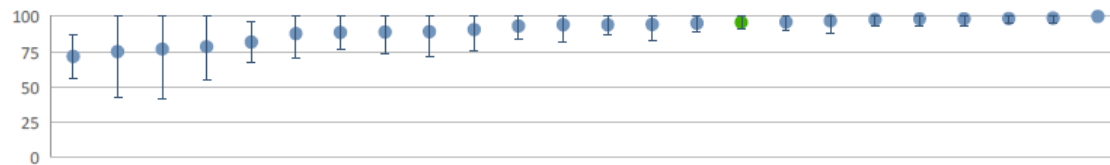
MTC 07 - MTCs deliver consultant led trauma teams ON ARRIVAL for triage positive patients

| Period | Numerator | Denominator | Trust value (%) | National mean (%) |
|----------|-----------|-------------|-----------------|-------------------|
| 16/17 Q2 | 134 | 143 | 93.7 | 91.3 |



MTC 08 - MTCs deliver consultant led trauma teams WITHIN 30 MINUTES for triage positive patients

| Period | Numerator | Denominator | Trust value (%) | National mean (%) |
|----------|-----------|-------------|-----------------|-------------------|
| 16/17 Q2 | 137 | 143 | 95.8 | 92.8 |





TRAUMA BEST PRACTICE TARIFF

if:

ISS >15

Treated at a MTC

Met all Best Practice Criteria

Search NICE...



Home > NICE Guidance > Conditions and diseases > Injuries, accidents and wounds > Trauma

Major trauma: assessment and initial management

NICE guideline [NG39] Published date: February 2016

Guidance

Tools and resources

Information for the public

Evidence

History

Overview

Recommendations

Context

Recommendations for research

Guidance

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Recommendations

< Next >

- [1.1 Immediate destination after injury](#)
- [1.2 Airway management in pre-hospital and hospital settings](#)
- [1.3 Management of chest trauma in pre-hospital settings](#)
- [1.4 Management of chest trauma in hospital settings](#)
- [1.5 Management of haemorrhage in pre-hospital and hospital settings](#)
- [1.6 Reducing heat loss in pre-hospital and hospital settings](#)
- [1.7 Pain management in pre-hospital and hospital settings](#)
- [1.8 Documentation in pre-hospital and hospital settings](#)
- [1.9 Information and support for patients, family members and carers](#)
- [1.10 Training and skills](#)



Royal College
of Surgeons

ADVANCING SURGICAL CARE



Major Trauma Workforce Sustainability

Outcomes of the RCS Major Trauma Workgroup



ST. MARY'S



ROYAL LONDON



KING'S COLLEGE



ST. GEORGE'S



ROYAL LONDON



THE LONDON MAJOR TRAUMA SYSTEM

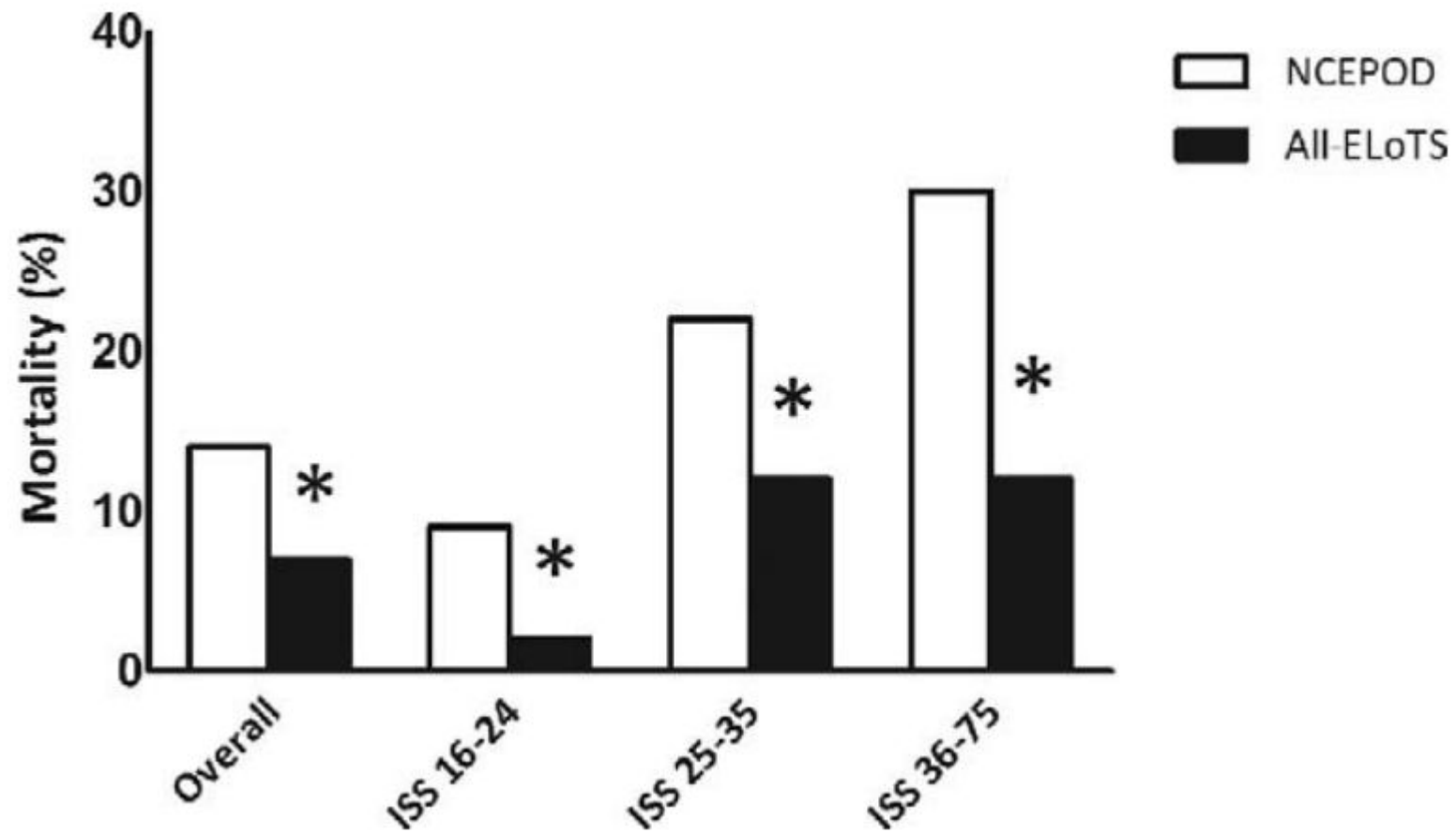
Large integrated supraregional trauma system

Population health model by design

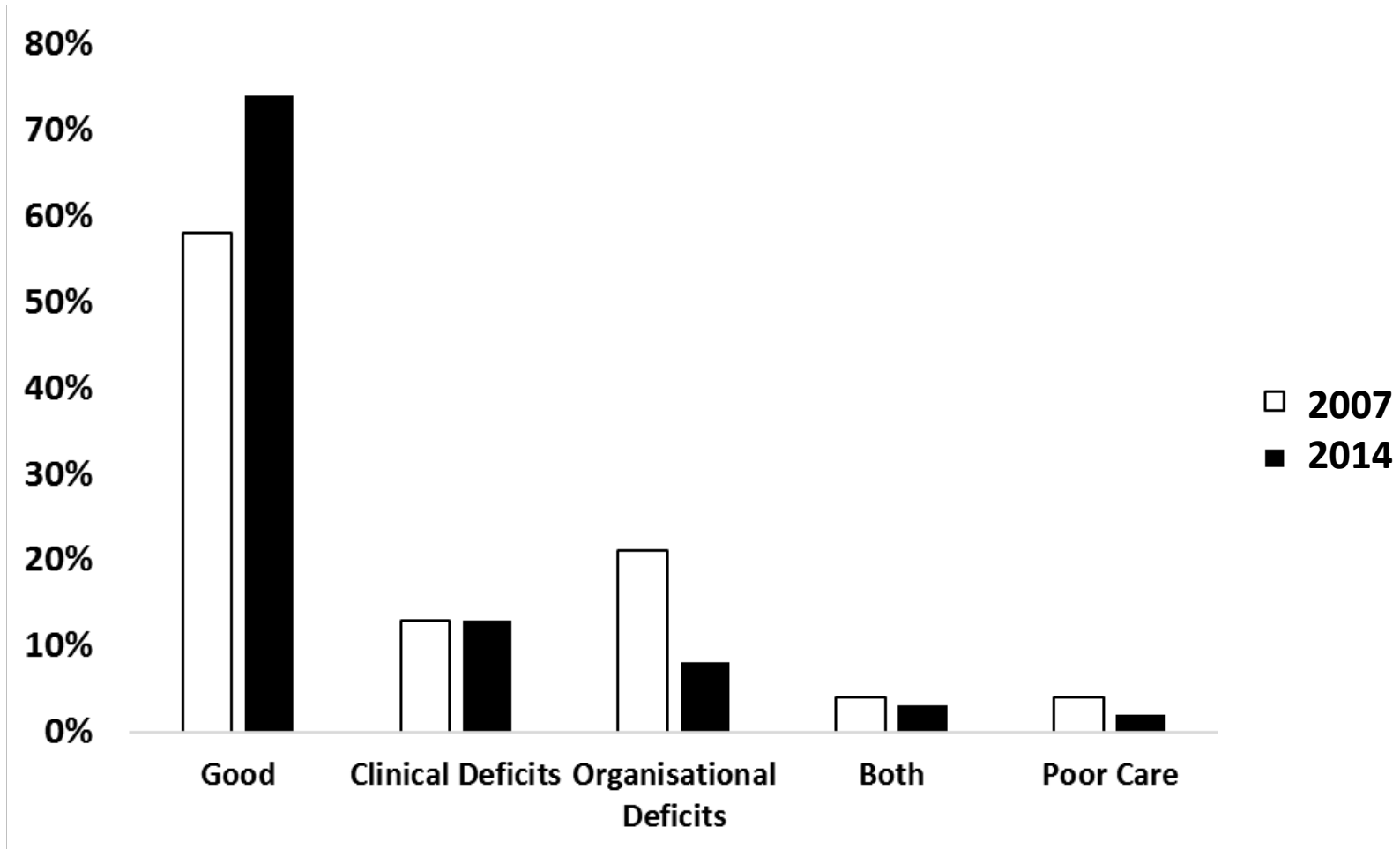
***33,000 trauma activations per year.
8,000 severely injured, 800 children***

300% increase in activity since 2010

Mortality



Quality of Care



THE LONDON MAJOR TRAUMA SYSTEM: WORKPLAN 22/23

3

| Focus area | Project | Objectives | Deliverables | Lead | Timeline | Background & Rationale |
|---|---|--|---|-----------|-----------|--|
| LONDON TRAUMA SYSTEM WORKPLAN 2021/22 | | | | | | |
| OPERATIONAL, GOVERNANCE, PLANNING & RECOVERY | | | | | | |
| Network Quality & Governance | Governance and oversight | Identify and mitigate London-wide risks in MTCs, TUs and CDNs | MTCs MTC & CDN specific peer review 2022. Assess implementation of recommendations from 15/20 & 2021. | KB | Q4 2021 | A number of issues and recommendations were made during 2019 regional peer reviews of MTCs & MTNs. |
| | Enhanced governance and quality improvement | Roll out Peer Review App (Perfect Ward) to all networks & deliver QI | | HK | Q1 2022 | NLETH has developed and piloted the use of the Perfect Ward app for enhanced real-time governance. To be rolled out across all London networks with enhanced standards. |
| Quality Monitoring & Improvement | Monitor and act on quality issues raised by Major Trauma Districtboards and Oversight Reviews | Provide assurance on network governance issues including: 1. Appropriate, Timely Access to, & Reporting of CT to Trauma Units 2. Completion of Rehabilitation Prescriptions across Trauma Units 3. BOAST 4 performance across MTCs | | MTN leads | Q1 2022 - | Provide oversight to MTN governance programmes and allow cross-fertilisation of solutions to inter-network issues. |
| | Triage Tool Audit | Evaluate impact of triage tool change | Audit of efficacy, impact and safety of triage tool change | KB | Q1 2022 | The Trauma Triage Tool was changed during COVID based on prior work to streamline the tool for a more inclusive system. |
| COVID response Audit & Lessons Learned | Collate actions and learnings from pandemics | Interim Major Trauma COVID report describing 2020 response. | | KB | Q3 2021 | Trauma care continued throughout COVID, and emergency and urgent changes were implemented to manage demand while protecting other healthcare resources including critical care beds. |
| | Major Trauma COVID report including 2021 activity | | | KB | Q1 2022 | |

London Major Trauma System Workplan 2021-22 v2.2 - Karim Brohi.

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| Focus area | Project | Objectives | Deliverables | Lead | Timeline | Background & Rationale |
|--|--|---|---|-----------------------|---------------------|---|
| Elderly Trauma Audit | Elderly Trauma Audit | Examine implementation of recommendations from Older Trauma Guidance | | EC / CH & Older group | Q3 2022 | Assess pan-system impact of our London elderly care guidance on processes of care and outcomes |
| | Paediatric Trauma Guidelines Audit | Examine implementation of recommendations from PDLDTs & Paed Trauma Guidelines | | Paed Group | Q4 2021 | London paediatric trauma guidelines were released in 2020 and included a number of recommendations including enhanced safeguarding, also identified in our PDLDT pan-network study. To audit response and effectiveness. |
| Maintain trauma care quality and provision | Maintain provision during COVID pandemic response and ensure services prevented during pandemic recovery | Maintain trauma provision and ongoing equity of access for patients | Risk register of pan-network service configurations & changes detailing potential risk to network services | KB | Q3 2021 and ongoing | Potential fragility of the trauma system was highlighted in 2020 peer reviews and ongoing service configurations have the potential to destabilise the system. |
| | Major incidents and mass casualty events | Provide training for clinical staff on the management of blast and ballistic injuries in the event of a major incident/mass casualty incident | Host a virtual pan London symposium with expert speakers from across the London Trauma system. Recording of sessions to enable wider access subsequently. | KB | Q3 2022 | The trauma system developed and implemented a new education and communications framework to maintain resilience during COVID immediately prior to Wave 1. Now focusing on enhanced education in major incidents for refresher/refresh. |
| TRANSFORMATIVE | | | | | | |
| Network inclusive and resource allocation | LMTS Integrated Care Model | Develop and implement an Integrated Care Model for a fully inclusive trauma system | Use new integrated care working to develop and implement a more inclusive trauma system across the region | KB | Q3 2022 | The London Trauma System was designed as an inclusive trauma system with all major trauma patients transferred to MTCs. Funding though is exclusive to MTCs and 50% of major trauma patients are (inappropriately) managed in trauma units. The system needs to be upgraded |

London Major Trauma System Workplan 2021-22 v2.2 - Karim Brohi.

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| Focus area | Project | Objectives | Deliverables | Lead | Timeline | Background & Rationale |
|--|--|---|---|---------|-----------|--|
| Trauma Unit Standards review | Trauma Unit Standards review | Review and update Trauma Unit & LDM standards | | KB | Q4 2021 | Trauma unit standards have not been reviewed formally for a decade and need updating to support future care delivery. There are top-London agreed standards for LDM which would be included within the new LMTS integrated care model above. |
| | Trauma Unit education programme | Increased support for TU care through multi-professional education | Collate and update educational programmes through our London Trauma School website | EC / KB | Q4 2021 | COVID has led to an "educational" gap where training and updates were paused due to pandemic pressures. Additionally, there are a number of new educational initiatives to support and develop the multi-professional workforce - and which can take advantage of increased acceptance of online delivery. |
| Enhanced Prehospital Care Information & Governance | LAS electronic patient care record integration with trauma clinical pathways | Achieve tighter integration with pre-hospital & in-hospital patient care data & to utilisation. | Improve data quality & governance. Enhanced feedback to prehospital providers. | FW / MF | Q3 2022 - | |
| Spinal Cord Injury | SCI Pathways | Develop with SCI networks an augmented programme for rehabilitation | Enhanced outreach and outreach models for SCI. Rehab equipment updates. Education programme for multi-professional staff. | VD | Q3 2021 | Integrated working with the Spinal Cord Injury network to improve the care pathways for spinal cord injured patients. |

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| Focus area | Project | Objectives | Deliverables | Lead | Timeline | Background & Rationale |
|--|---|--|--|-----------------|----------|---|
| Rehabilitation | Acute inpatient rehab in MTCs | Developing new models of care to improve efficiency and release value. | Support MTCs in developing on-site acute inpatient rehabilitation for level 1 & 2 trauma patients. | AEW | Q3 2022 | Acute inpatient rehabilitation is a key to improving care pathways for severely injured trauma patients, including those with spinal cord injury. An on-going project to institute acute rehabilitation beds in the MTCs. |
| | Chest Wall Injury | Enhanced care for patients with chest wall injury | Chest wall and rib fracture toolkit, Chest wall animation & web pages. Refined discharge pathway for patients with blunt chest wall injury | EC / Elderly | Q4 2021 | Chest wall injury is a major cause of mortality, and hospital stay - and contributes to mortality, especially in the elderly. Over 2000 patients have major chest wall injuries across the system every year. We have shown how focus on this can improve outcomes and reduce length of stay. |
| ICS ALIGNMENT & POPULATION HEALTH | | | | | | |
| Injury Prevention | Integrated mental health psychology programme | MTC Mental health Psychological Support Programme (with VRN) | Embedded psychology capability with capacity in all MTCs | KB | Q4 2022 | In collaboration with the violence reduction network and the national security response to major incidents, there is a need to provide high quality psychological care to all trauma patients, to upscale in times of crisis, and to support the mental health of the workforce. |
| | Violence reduction | Support delivery of VR Network goals | Support and deliver the goals of the development of the NHS Violence Reduction Academy | KB / VR Network | Q4 2022 | Many of the violence reduction network's activities will be delivered or coordinated through the major trauma centres and networks. Integrate with multiple existing violence reduction activities taking place across the trauma system. |

London Major Trauma System Workplan 2021-22 v2.2 - Karim Brohi.

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| Focus area | Project | Objectives | Deliverables | Lead | Timeline | Background & Rationale |
|---|--|---|--|-------------|----------|---|
| Integrated pathways for Fall Prevention | Develop Falls Prevention pathway and awareness in conjunction with ICAs and PCNs | Falls prevention pathway / awareness programme | | EC | Q1 2022 | The population health model of care delivered through ICAs allows a number of new opportunities for injury prevention. Falls assessment and prevention is a key area where there can be substantial impact in injury prevention by taking with primary care and existing falls prevention services. |
| | Diversity Point Prevalence Survey | Understand diversity of LMTS patient population for future care delivery | Map system diversity across all protected characteristics with geographical distribution | EC/KB | Q4 2021 | Trauma is a disease of inequality, and we need to understand the diversity of the populations of London and the South East across all the protected characteristics, and how these are associated with injury patterns and the care they receive. |
| Rehabilitation | Community MGR rehabilitation | Develop community/location of rehab schemas for community rehab | Community vocational rehab models integrated with the ICs system | Rehab group | Q1 2022 | There is an on-going need for vocational rehabilitation in large groups of trauma patients to promote return to work and education. ICs structures including local authorities present an opportunity to develop models for these programmes. |
| WORKFORCE & EMPLOYMENT | | | | | | |
| Secure Trauma Unit workforce and sustainability | Trauma Unit Core Staff Funding | Maintain trauma unit quality & standards through a secure, sufficient workforce | Finalised cost model for trauma unit / LDM staff and activity | KB | Q1 2022 | Part of LMTS Integrated Care Model project above. |
| Network Workforce Education | Inpatient staff education & engagement | Improve knowledge & engagement of inpatient multi-professional staff | Web knowledge packages to support system inclusions (as above) TCBAR | EC / KB | Q3 2021 | The pandemic has led to an "educational gap" in the workforce where training and development has been put on hold. This is in addition to a business need to. |

London Major Trauma System Workplan 2021-22 v2.2 - Karim Brohi.

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| Focus area | Project | Objectives | Deliverables | Lead | Timeline | Background & Rationale |
|--------------------------------------|---|---|--|-----------------------|----------|---|
| Emergency Department Nurse Education | Emergency Department Nurse Education | Assure sufficient provision of trauma education to maintain competencies and meet commissioning standards | Validate existing bespoke trauma nursing courses and increase availability of trauma nursing education within the London Major Trauma System. | EC / HR Nursing group | Q3 2022 | There is currently insufficient provision of accredited trauma nursing courses to meet demand in London. |
| | Patient & Public engagement | Secure resources for patient & public engagement programme | Resources for Engagement point of alternative model to manage patient & public forum, website, conduct meaningful engagement and awareness activities with the population of London & the South East | KB | Q4 2021 | While we have active patient and public engagement in certain areas of trauma care and research, dedicated resource is needed to deliver meaningful population based engagement programmes to support LMTS activities and development. |
| Organisational Development | Trauma System television series | TV Series to raise awareness of trauma and system functions | TV Series on the functioning of the trauma system | AH | Q3 2022 | Work with the Garden production company across the System to showcase the work of the networks and all teams in what it takes to deliver comprehensive trauma care. |
| | Trauma Director & Manager Development Programme | Scope need and options for the development of trauma directors & managements across the four networks | | KB | Q3 2022 | As the system emerges from COVID and into a potentially upgraded model of system delivery within a new population health/ICs system, there is a need for development of the workforce leaders across the system to support them in delivery and change. |
| Trauma System Development programme | Develop trauma system knowledge and leadership in early career trainees | Develop trauma system knowledge and leadership in early career trainees | Charo or equivalent fellowships to work with trauma networks and pan-London system. | KB | Q4 2022 | Similarly, we need to develop early career doctors, nurses and A&Ps in the knowledge of the structure and function of population health based trauma |

London Major Trauma System Workplan 2021-22 v2.2 - Karim Brohi.

TOWARDS MORE INCLUSIVE TRAUMA CARE

TRAUMA NETWORKS: NEW NETWORK MODEL

Address system inequities

Avoid lost populations

Allow system to flex around future London healthcare changes

Allow new integrated models of prevention, care & recovery

Education programmes

Trauma care doesn't stop at the ED doors.
Why should trauma education?

Now you can provide
Standardized Trauma Fundamentals Courses
for your nurses across the trauma spectrum!

TCAR
TRAUMA CARE AFTER RESUSCITATION

PCAR
PEDIATRIC CARE AFTER RESUSCITATION

Celebrating our first
London TCAR class
June 2018



TCAR
EDUCATION PROGRAMS



London Major Trauma System

The Inaugural TALONS Course
TrAuma LONdon Surgery

Tuesday 5th June
Royal London Hospital
Free to London Surgical Middle Grade
Trainees/non-trainees

A one-day, interactive, scenario-based lecture
course
Life-threatening injuries and damage control
techniques

Vascular
Thoracic
Abdominal
Pelvic
Mass Casualty

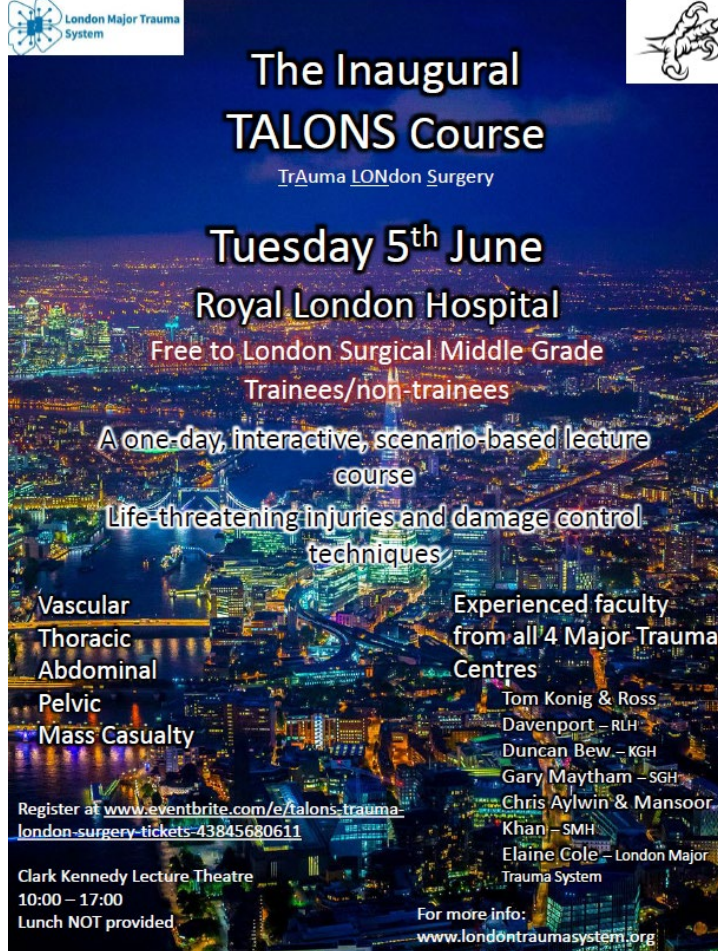
Experienced faculty
from all 4 Major Trauma
Centres

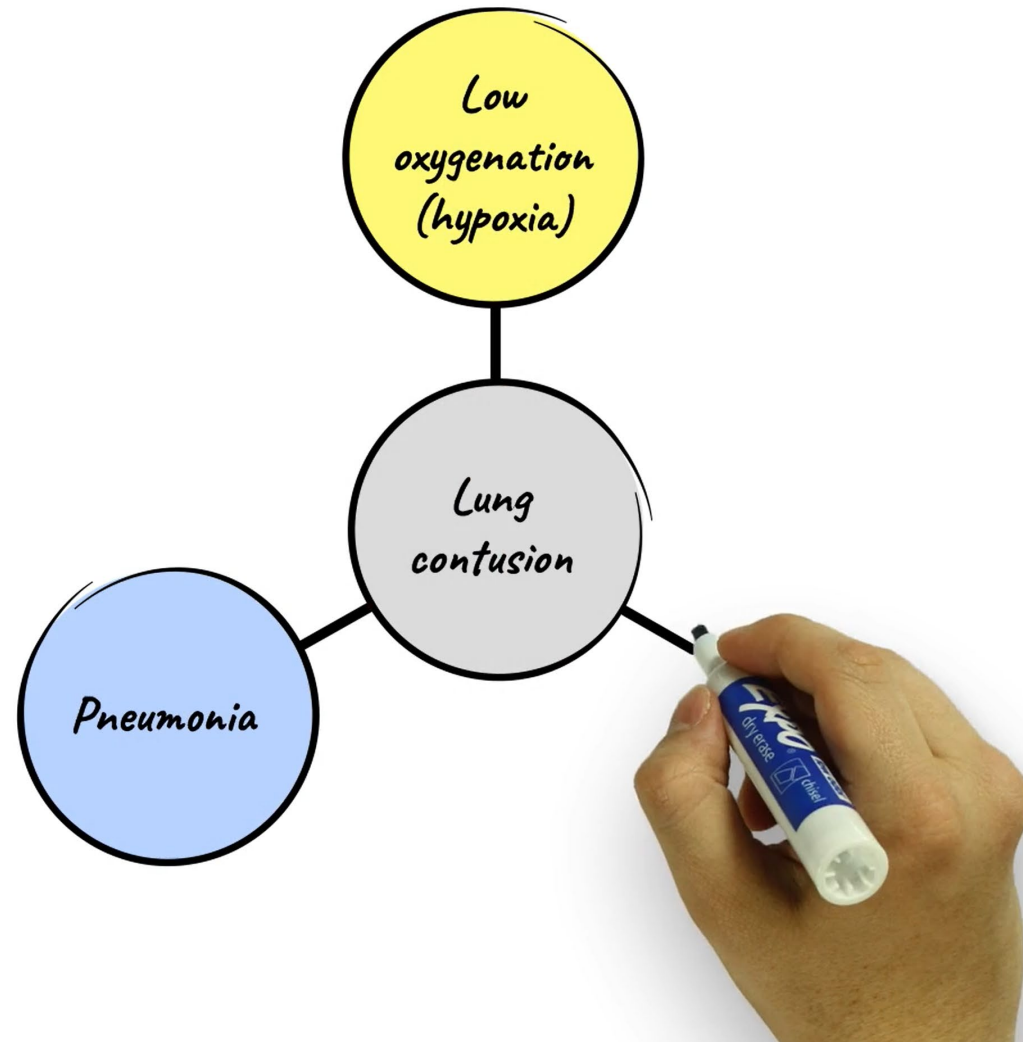
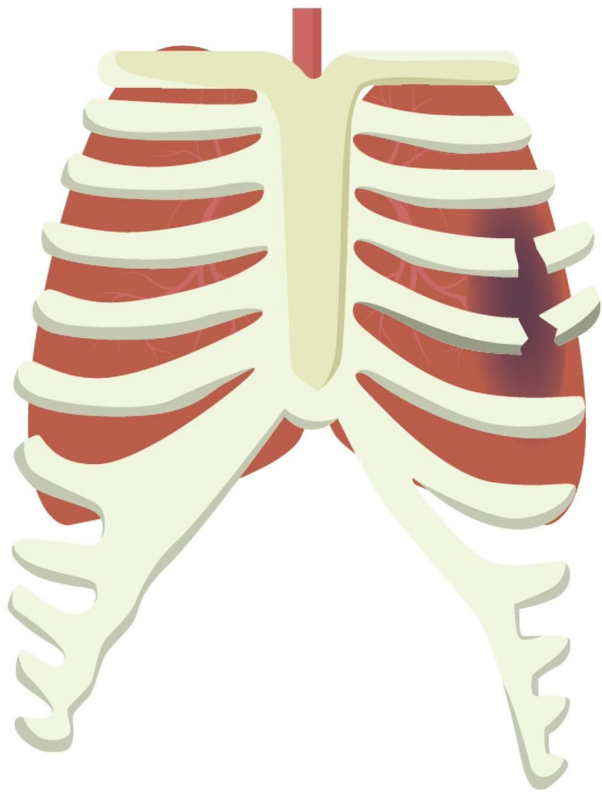
Tom Konig & Ross
Davenport – RLH
Duncan Bew – KGH
Gary Maytham – SGH
Chris Aylwin & Mansoor
Khan – SMH
Elaine Cole – London Major
Trauma System

Register at www.eventbrite.com/e/talons-trauma-london-surgery-tickets-43845680611

Clark Kennedy Lecture Theatre
10:00 – 17:00
Lunch NOT provided

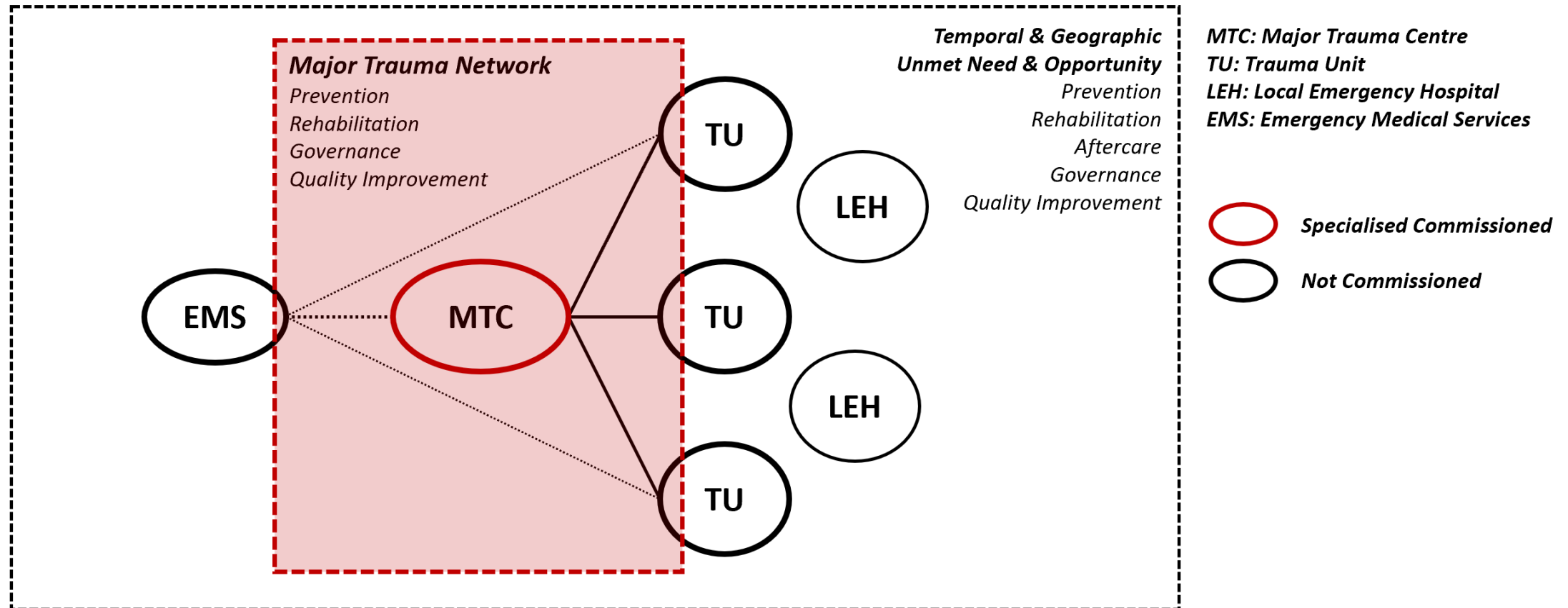
For more info:
www.londontraumasystem.org





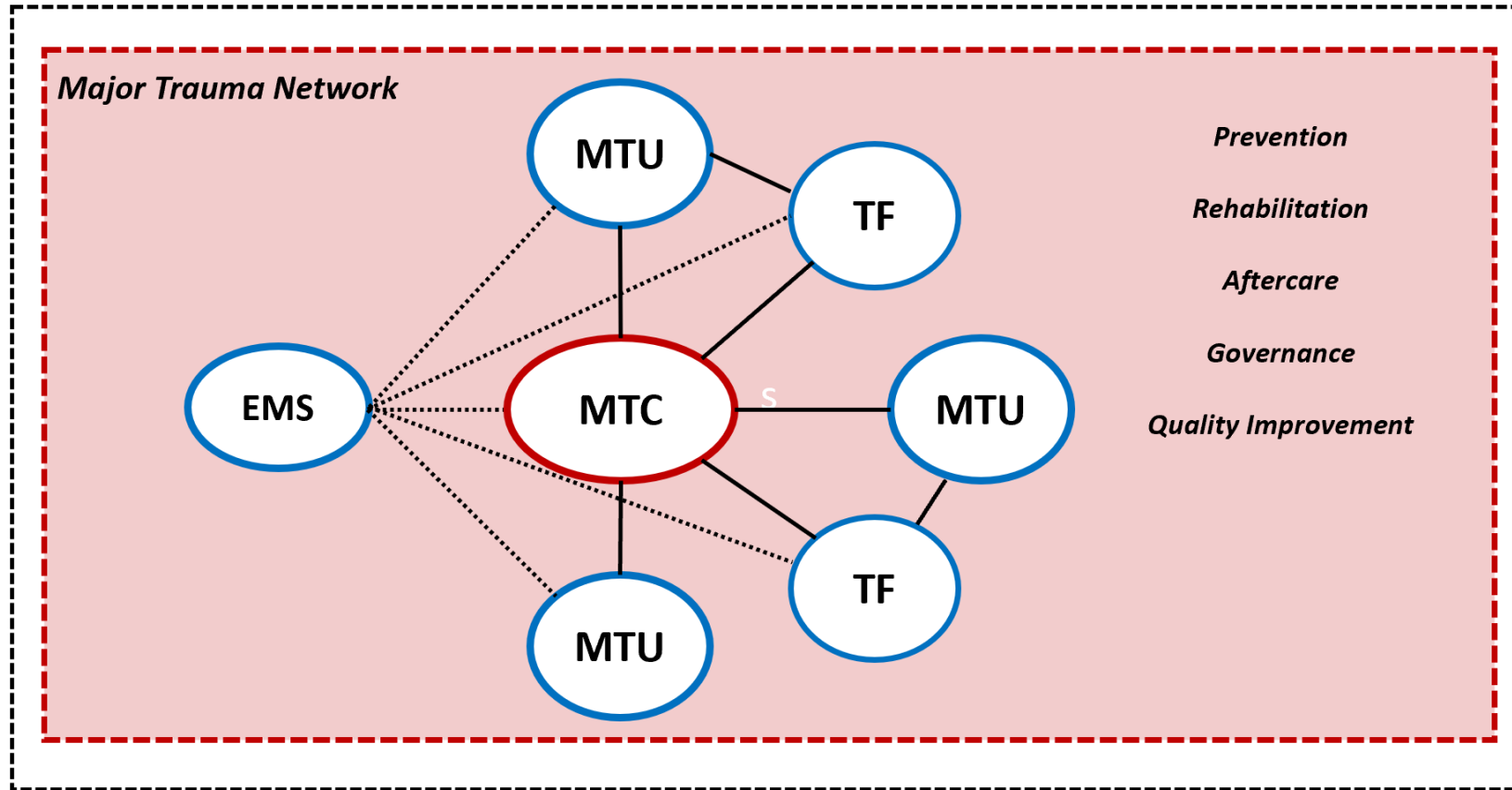
TRAUMA NETWORKS: CURRENT STRUCTURE

Regional Patient Population



TRAUMA NETWORKS: PROPOSED MODEL

Regional Patient Population



MTC: Major Trauma Centre

MTU: Major Trauma Unit

TF: Trauma Facility

EMS: Emergency Medical Services

 ICS Commissioned

 Specialised Commissioned

INTEGRATED TRAUMA PSYCHOLOGY

A multi-agency regional Trauma Psychology Network chaired by Regional Clinical Lead and linked into London's Major Trauma System

Local Psychological Trauma Network

Local Psychological Trauma Network

Local Psychological Trauma Network

Local Psychological Trauma Network

Additional capacity and capability plugged into the model when a Major Incident occurs facilitated by local and regional networks

- Active outreach extends to victims and witnesses of the Major Incident


Injury or Major Incident



Traumatic injury resulting from:


- Road traffic accident
- Violence
- Self-harm
- Falls
- Major Incident / Terrorism

Major Trauma Centre




Trauma-informed MTC workforce

All MTC staff to have basic psychological skills specific to major trauma and psychology approaches are embedded in all areas of trauma care




Proactive screening and assessment of all trauma patients

Brief, psychometric screening tools are used for all trauma patients to target at-risk individuals for further assessment or intervention, 48-72 hours post event



Formulation of needs and psychological interventions whilst in hospital

Delivery of evidence-based psychological interventions that are flexible and adapt according to the changing needs of the patient




Rehab Prescription (RP)

In all discharge planning, the RP which sets out exactly what treatment is required for an individual must include psychology input


Collaboration and effective pathways in-hospital with liaison psychiatry, paediatrics

Post Discharge



Active outreach through a 'Discharge plus' model

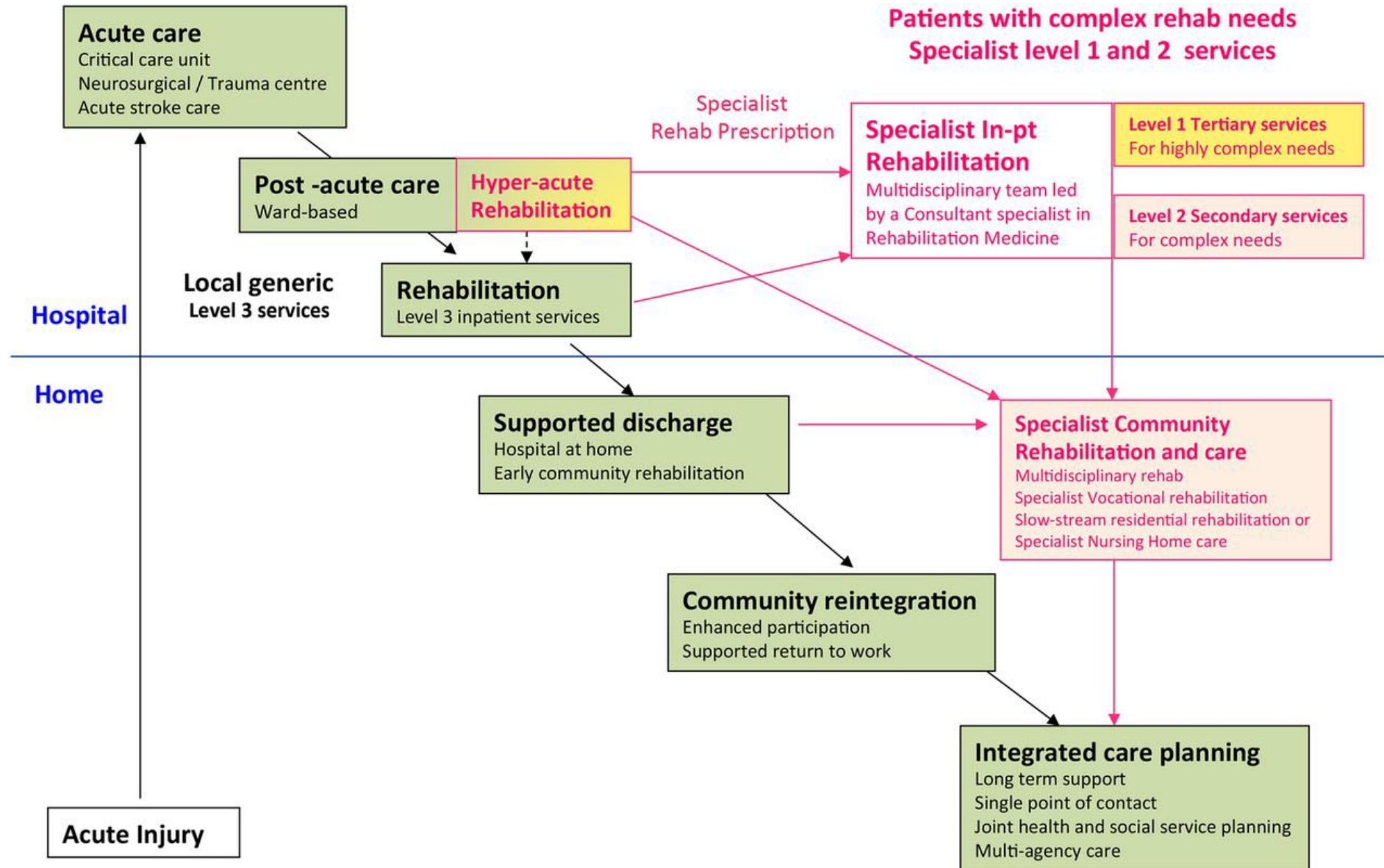
Further screening after discharge, either by telephone or through Major Trauma MDT outpatient clinics



Care navigation and effective referrals

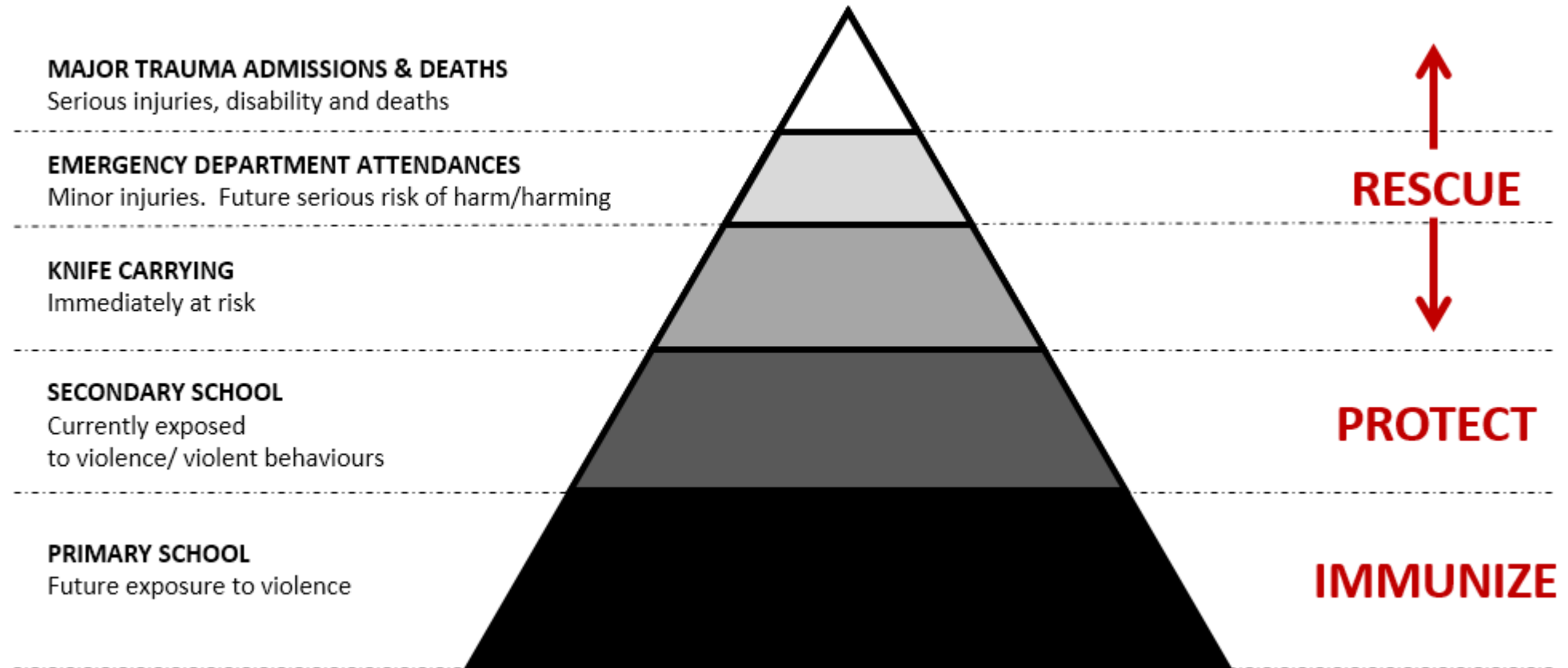
Trauma Psychology Team supporting the patient where necessary into community mental health services, informal rehabilitation networks or third sector organisations, ensuring patients are supported and guided to the right support and treatment.

HYPERACUTE REHABILITATION



INJURY PREVENTION

LONDON TRAUMA SYSTEM
PUBLIC HEALTH MODEL OF VIOLENCE REDUCTION



Vision Zero for London





London Major Trauma
System



London
Operational Delivery Networks

London Major Trauma System: **Management of elderly major trauma patients**



MAJOR INCIDENT MANAGEMENT

sky NEWS HD



FOX

LONDON TUBE STATIONS SHUT DOWN

MAKING NEWS • BREAKING NEWS • BREAKING NEWS • BREAKING NEWS • BREAKING NEWS • BREAKING NEWS • BREAKING NEWS

FOX 5

6:27 84°

REPORT: CAR MOUNTS PAVEMENT HITTING PEDESTRIANS IN LONDON

PEDESTRIANS HOSPITALIZED FAN



PLATFORM FOR RESEARCH & INNOVATION

CRYOSTAT 2

| | | |
|---|---|--|
| 120435J | 7 APR 2017 | |
|  |  | A RH-POSITIVE |
| Cryoprecipitate (CPD-A1) Human |  |  |
| Infuse using per the label | Lot: 87K04B67 | Use By: |
| BEI Baxter Baxter Healthcare Corporation Deerfield, IL 60015 | DO NOT USE! | 17 APR 2018 |



www.hems-london.org.uk

ashurst

GRATTE BROTHERS



Preston Motors

SAINTS TRANSPORT

London Heliport

AMBULANCE

LONDON'S HELICOPTER AMBULANCE



***LONDON TRAUMA SYSTEM:
CONTEMPORARY, EQUITABLE, INCLUSIVE
FUTURE-RESILIENT TRAUMA CARE***

Inclusive of geography, population and providers

Equity of access, resource and recovery

Excellence in physical and psychological injury care

Equitable for all citizens

Delivering a resilient city