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# The Trauma Audit & Research Network

*An overview*



  
*The TRAUMA*  
*Audit & Research*  
**NETWORK**

DEVELOPING EFFECTIVE CARE  
FOR INJURED PATIENTS THROUGH  
PROCESS AND OUTCOME  
ANALYSIS AND DISSEMINATION

*"A National Trauma Audit and Research Network should collect data from all hospital Trusts that receive severely injured patients. The development, improvement and monitoring of the standards of care for severely injured patients would thus be assured."*

RCS/BOA Joint report 'Better Care for the Severely Injured'  
June 2000

*"Over the last decade, improvement in trauma services have made important contributions to the reduction in deaths, but there remains evidence of significant variation in UK performance."*

Trends in Trauma Care in England and Wales 1989-97  
Lancet 2000; 355:1771-75

*"Audit of the results (which is likely to depend on the severity of the case mix), treatments and the organisation pathway, is essential."*

Report of Working Party on Management of Patients with Head Injuries  
June 1999 RCS

*"The overall aims of TARN fit in well with the Clinical Governance agenda. In particular, trusts are required to put in place arrangements for monitoring and improving the quality of health care they provide. Continuous trauma audit is an integral part of this process. Currently participation in TARN runs at 49 per cent of trauma-receiving trusts. Chief Executives of those remaining trusts are urged to consider this very useful audit tool."*

Chief Executive Bulletin, Department of Health  
August 2002

Supporting Groups:

The Royal College of Surgeons  
The Healthcare Commission  
The Senate of Surgical Colleges  
The Federation of Surgical Speciality Associations  
The Society of British Neurological Surgeons

## *Trauma - a major problem*



- Worldwide injury is a major public health problem. In many countries this is unrecognised because of the paucity of available statistics.
- In the UK, injury is the commonest cause of death between the ages of one and forty.
- For every fatality there are at least two survivors with serious permanent disabilities.
- There is a strong relationship, particularly with children, between social deprivation and the incidence of injury and some evidence that the disadvantaged are less likely to survive.
- The facilities for treating the injured and their effectiveness vary across the UK.

### **An expensive problem for the country...**

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Every trauma death costs the nation in excess of £0.75 million and every major injury £50,000. Cost effectiveness analysis is routinely used by highway authorities to assess the potential effect of road safety measures. In contrast, there is no equivalent on-going financial analysis undertaken to measure the effectiveness of new developments in trauma care.

This is, in part, because the apportionment of costs would be difficult, but also because there is no culture of economic appraisal of emergency health care systems at the point of delivery. Yet the potential savings are huge.

# TARN - *Part of the Solution*



The Trauma Audit & Research Network (TARN) is a collaboration of hospitals from all over England, Wales, Ireland and other parts of Europe which supports a group of staff on a non-profit making basis; based at the University of Manchester, Hope Hospital, Salford.

The Trauma Network has been operating since 1989 and in 1997 became self-funding. The TARN database is the largest trauma database in Europe with more than 200,000 cases including over 22,000 paediatric patients.

Outcome is affected by management of the injured through all areas of the healthcare system - ambulance services, emergency medicine, critical care, operating theatre, radiology, ward care, rehabilitation and many other departments.

All can benefit from national comparative trauma audit

## Overall Aim

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- to collect and analyse clinical and epidemiological data and thereby to provide a statistical base to support clinical audit, to aid the development of trauma services and to inform the research agenda.

## Objectives

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- Support **multidisciplinary** clinical audit by analysis of individual case management
- Provide **comparative statistics** to clinicians about institutional performance
- Provide **summative information** to local health commissioners about the trauma workload and its management
- Provide population based statistics on the **epidemiology** of trauma
- Identify areas of potential research interest
- Refine methods of **measuring** injury severity, particularly those concerned with disability.

# TARN - *Participation and Innovation*



## Participation

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TARN membership has grown from an initial group of 13 hospitals to over 50% of trauma receiving hospitals in England and Wales.

## Innovation - EDCR System (Electronic Data Collection and Reporting)

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An online data collection and reporting system was successfully launched to all participating Trusts (region by region) between September 2005 and March 2006. Not only is the EDCR a versatile data collection tool, but it is also designed to act as a robust reporting system allowing users to produce clinical case reports as well as ad-hoc analyses on a selected range of fields. To complement the reporting, the system is designed with a built-in calculation for Probability of Survival (Ps) scores.

The EDCR system provides the ability to collect a far greater range of data than ever before. Due to this, it is anticipated that it will provide a more reflective picture of the overall process of care of the severely injured patient.

Data security and support is of the highest importance to TARN and the EDCR is therefore securely hosted upon a dedicated server at the University of Manchester Computing Centre. The centre, with more than 10,000 PCs across campus can certainly be proud of its status as one of the largest academic computing facilities in Europe. It provides high-end specialist computing services, in-depth support to the University of Manchester and a wide range of external services to the UK and international research and learning communities. To ensure data security, SSL certificates (Secure Sockets Layer) have been integrated into the system. SSL is a leading security protocol on the Internet and is widely used to validate the identity of a web site and create an encrypted connection for sending personal data. To further strengthen security, data remains in an encrypted format within the database.

# TARN - *Information is Key*



## Clinical Case Reports

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Clinical Reports are produced on a monthly basis and identify the outcome of all patients submitted to TARN the previous month who have received emergency care and highlights suggested cases for review. The reports can be used for discussion at clinical audit meetings, which in the long term will improve patient care locally, as well as contributing to staff development.

## Quarterly Reports

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Reports are produced every three months with process and outcome measures for each site compared against the database. The report includes Charts, which indicate overall hospital performance against other participating sites.

## Ad Hoc Analyses

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Ad Hoc Reports and Analyses can be produced for any participating hospital and can contribute towards both local studies and national comparisons, which can then be used at multi-speciality meetings - a proven way of monitoring and improving trauma care.

## TARN Support

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The Trauma Audit & Research Network is able to provide the following support to all participating sites:

- Education - STARTUP & Injury Scaling Courses
- Uniform Coding
- Validation
- Quality Control

## Using your TARN Reports

- ✓ Schedule regular Audit Meetings
- ✓ Invite speakers from all Trauma receiving departments
- ✓ Theme meetings e.g. Head Injuries
- ✓ Always use constructive discussion
- ✓ Present your hospital in relation to other TARN sites (Comparative Outcome Charts)

# TARN - *Improvement Comparisons*



## Evidence of improvements in healthcare

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- ✓ *Improvements in the standardised W score in some participating hospitals*
- ✓ *Increase in the odds of survival of injured patients throughout one region of England*
- ✓ *National increase in Senior Doctors treating seriously injured patients*

## Evidence of changes in practice

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- ✓ *Improved documentation of clinical notes*
- ✓ *Increases in multi disciplinary meetings*
- ✓ *Improved communications between specialities*

# TARNlet - a paediatric focus

“Children are different” but, remarkably, very little work has been published which permits an analysis of paediatric trauma care. The main TARN database contains information on over 22,000 children under the age of sixteen and has been a valuable asset. For example it has been used to demonstrate improvements in outcome during the 1990s<sup>1</sup>.

In the UK there are very few trauma systems designed exclusively for children but the variation in provision could, perhaps, be described as a natural experiment waiting to be analysed. Are paediatric trauma services better when they are integrated within a children’s hospital or is the system more effective when adult and children’s trauma services are mixed?

‘TARNLET’ was established in 2000 to address these and other questions relating to paediatric trauma care: A discrete paediatric group has been formed.



Reducing accident rates in children and young adults: the contribution of hospital care.  
I Roberts, F Campbell, S Hollis, D Yates on behalf of the Steering Committee of the Major Trauma Outcome Study Group (now TARN): BMJ 313 1239-1241.

Patterns and Risks in spinal trauma  
Martin BW, Dykes E, Lecky FE: Arch Dis Child 2004; 89:860-865

## TARNlet Committee

Mr Derek Burke	Consultant Paediatrician, Sheffield Children’s Hospital
Miss Elizabeth Symonds	Consultant in Emergency Medicine, Hereford General Hospital
Mr Lorcan Duane	Consultant in Emergency Medicine, Booth Hall Hospital
Ms Julie Flaherty	Paediatric Emergency care Consultant, Booth Hall Hospital
Mr Ian Maconochie	Consultant in Paediatric Emergency Medicine, St Mary’s Hospital, London
Mrs Yvonne Murray	Chair, Clinical Audit Committee, Royal Manchester Children’s Hospital
Mr Stephen Playfor	Intensivist, Royal Manchester Children’s Hospital
Professor David Lloyd	Consultant Orthopaedic Surgeon, Department of Child Health, Alder Hey
Mrs Maralyn Woodford	Executive Director, TARN
Professor David Yates	Chairman, TARN
Dr Fiona Lecky	Research Director, TARN
Mr John Thorne	Consultant Paediatric Neurosurgeon, Hope Hospital



# EuroTARN - *The European Agenda*



## Current Status

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Trauma is a global burden and has a social and financial impact upon health services across Europe with an estimated 5.1 million deaths across the world in 2002. Individual trauma registries have been established to improve patient outcome by identifying best practice and current standards of care. However, due to the varying number of individual registries there are no means at present to make a comparable assessment of trauma care and outcome across Europe.

EuroTARN is a collaborative group who's aim is to establish a European trauma registry. The group was established back in 2002 and has a wide European representation.

## EuroTARN - Aims & Objectives

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A European Trauma Registry would:

- Run concurrently with other established European registries and assist in the development of clinical guidelines
- Help to promote high standards of care for trauma victims across Europe
- Aid the study of the epidemiology of trauma and thereby promote a rational approach to injury prevention

# TARN - *Research Portfolio*



## Key Publications

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**A new approach to outcome prediction in trauma: a comparison with the TRISS Model**

FE Lecky & O Bouamra on behalf of the Trauma Network  
Journal of Trauma 2006 Vol 61 Issue 3

**Prevalence of Pelvic Fractures, Associated Injuries and Mortality: The United Kingdom Perspective**

P.V. Giannoudis, M.R.W. Grotz, G.E. Wells, H. Dinopoulos, O Bouamra, F. Lecky

Accepted by Journal of Trauma

**The effect of working hours on outcome from major trauma**

H R Guly, G Leighton, M Woodford, O Bouamra, F Lecky, on behalf of the Trauma Audit and Research Network  
Emerg Med J 2006; 23:276-280

**Trends in head injury outcome from 1989 to 2003 and the effect of neurosurgical care: an observational study**

HC Patel, M Woodford, AT King, DW Yates, FE Lecky on behalf of the Trauma Audit & Research Network  
The Lancet 2005; 366:1538-44

**The Utilisation of intraosseous infusion in the resuscitation of paediatric major trauma patients**

Smith R, Davis N, Bouamra O, Lecky F  
Injury 2005; 36:1034-1038

**Head injuries: a study evaluating the impact of the NICE head injury guidelines**

Z Hassan, M Smith, S Littlewood, O Bouamra, D Hughes, C Biggin, K Amos, AD Mendelow, F Lecky  
Emerg Med J 2005; 22:845-849

**Patterns and risks in spinal trauma**

Martin BW, Dykes E, Lecky FE  
Archives of Disease in Childhood 2004; 89:860-865

**Lack of change in trauma care in England & Wales since 1994**

Lecky FE, Woodford M, Bouamra O, Yates DW  
Emergency Medical Journal 2002; 19:0-3

**Systolic hypertension and the response to blunt trauma in infants and children**

Paul Dark, Maralyn Woodford, Andy Vail, Kevin Mackway-Jones, David Yates, Fiona Lecky  
Resuscitation 2002; 54: 245-253

# TARN - Board & Executive Members



Mr Nigel Zoltie*	Consultant in Emergency Medicine, Leeds General Infirmary
Dr Kathy Rowan	Director of Intensive Care National Audit and Research Centre (ICNARC)
Professor Jon Nicoll	Director SCHARR
Ms Gaby Lomas	Emergency Medicine Nurse, Hope Hospital
Professor Sir Miles Irving	Chairman, Newcastle Hospitals NHS Trust
Dr Peter Oakley*	Consultant Intensivist, North Staffordshire Royal Infirmary
Professor Tim Coats*	Consultant in Emergency Medicine, Leicester Royal Infirmary
Mrs Maralyn Woodford*	Executive Director, TARN
Professor David Yates*	Chairman, TARN
Dr Fiona Lecky*	Research Director, TARN
Professor Ronan Lyons	Professor of Public Health, University of Swansea
Mr Tim Pigott	Consultant Neurosurgeon, The Walton Centre for Neurology and Neurosurgery
Professor Keith Willett*	Trauma Consultant, John Radcliffe Hospital, Oxford
Mr Peter Hutchinson	Honorary Consultant Neurosurgeon, Academic Neurosurgery Unit, Cambridge
Mr Ken Dunn	Burns/Plastic Surgeon, South Manchester University Hospital
Mr Roy Dudley-Southern	Team Leader and Strategic Planning Manager, Greater Manchester PCTs Collaborative Commissioning Team
Mr David Dalton	Chief Executive, Hope Hospital, Salford
Mr David Mendelow*	Professor and Head of the Department of Neurosurgery, Newcastle General Hospital
Ms Sally Hollis	Medical Statistician, Medical Statistics Unit, Lancaster University
Professor David Lloyd*	Chair, Royal College of Surgeons of England Trauma Committee
Mr Martin Smith*	Consultant in Emergency Medicine, Hope Hospital
Mr Brian Clingan	Northwest Development Officer, Headway
Dr Jan Jones*	Health Audit Manager, Queen's Medical Centre, Nottingham
Dr Ian Maconochie*	Consultant in Paediatric Emergency Medicine, St Mary's Hospital, London
Professor Ian Roberts	Professor of Epidemiology, London School of Hygiene and Tropical Medicine

\* Members of the Executive Committee

## International Advisors

The following experts in trauma scoring, audit and research support the international work of TARN

Mr H Champion	Trauma Surgeon, Washington USA
Professor H Deloos	President, European Society for Emergency Medicine, Leuven, Belgium
Ms E Woodzin	Co-Chair International Injury Scaling Committee

# TARN - *Contact Details*



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