— Session III —

Experiences with Trauma Registries in Special Groups of Patients and from Special Types of Data

Neurotrauma
Carsten Kock-Jensen
Århus, Denmark
[abstract not available]

Paediatric Trauma
Phillipe Gabrielle Meyer
Paris, France
[abstract not available]

Airway Management
Frédéric Adnet
Paris, France
[abstract not available]

Prehospital Data
Charles Deakin
Southampton, UK
[abstract not available]

Military Data
Matthias Helm
Ulm, Germany
[abstract not available]

— Session IV —

The Utstein Style Recommendations for Reporting Data Following Major Trauma–An Update
Peter A. Oakley, MA, FRCA, MRCGP
Consultant in Anaesthesia and Trauma, North Staffordshire Hospital, Stoke-on-Trent, UK
Senior Research Fellow, Keele University

In 1998, a multidisciplinary group of clinicians met in Mainz to define the requirements for reporting major trauma data for research and audit. Core and optional data requirements were debated and defined in a process that mirrored the one used successfully for cardiorespiratory arrest data at Utstein Abbey near Stavanger.

Collecting data following major trauma is inherently more complex than after cardiorespiratory arrest. There are more than 130 data points in the Utstein trauma data set, including more than 80 in the core data, compared with only 15 in the recommendations for cardiorespiratory arrest. In the first study to test the Utstein recommendations, Lossius et al found that only 47% of the core data were available retrospectively. While reducing the data set would improve the logistics of data collection, this would risk oversimplification.

A generic model of trauma care emerged during the Mainz workshop. It was based on the object-orientated concepts used in software engineering to model complex systems. It was hoped that this would handle complexity, facilitate data structure development (i.e., database design), and better recognise the different phases of trauma care (rather than focusing only on events at the scene and on arrival in hospital). The patient starts in a pre-morbid state, sustains a set of injuries, and proceeds through a set of locations (scene, ambulance, resuscitation room, CT scanner, operating theatre, ICU, etc., to the rehabilitation unit), accompanied by a set of attendants (bystander, paramedic, immediate care doctor, trauma team, etc.). As the patient passes through each location, information is received from the patient as observations and investigations (sensors) and interventions are effected as fluids, drugs, operations, and other interventions (effectors). Object-orientated concepts help to describe different instances of objects in the model, e.g., a bystander is an attendant with a more restricted skill set than an intensive care doctor and plays a different role, but the generic model encompasses them both within a simple data structure.

A database design has been developed in Stoke-on-Trent, UK, to pilot this approach, using a Microsoft SQL Server® database with a Microsoft Access® front end. For the last 18 months, information on new trauma patients has been entered and data from more than 10,000 patients on the old database have been transferred across. A reporting, profiling, and downloading capability has been developed.

A full analysis of the system's capability has not yet been performed, but it is so far proving to be practical and robust. Despite initial concerns that it would be too all-embracing, it has been well received by the data collectors. The system expects all entries to be timed, but copes well with missing times. It tracks locations and personnel throughout the patient's stay in hospital. New concepts have been introduced, such as the attending area (to cope with different levels of care within the same location) and the diagnostic track (to follow the evolution of diagnosis, including suspected, missed, definitive, and refuted injuries). The automatic reporting and analysis modules, while of considerable value, are currently undergoing further development. Importantly, the design allows the data set and range of entries to be extended without programming.

In summary, the Utstein recommendations have highlighted the difficulties of data collection following trauma. The way to cope with the intrinsic complexity of trauma data is to develop a generic, object-orientated model of trauma care, mirrored in the data structures that represent it. The challenge then is to implement it as a convenient, robust system.

References

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2. Lossius ML, Langhelle A, Soreide E, Pillgram-Larsen J, Lossius TA, Laake P, Steen PA. Reporting data following major trauma and analysing factors associated with outcome using the new Utstein style recommendations. *Resuscitation* 2001; 50:263–72.

Thursday, May 23, 2002

Plenary Session: Keynote Lectures

Improving the Trauma Chain of Survival and the Trauma Team: Do We Have the Answers?
Peter A. Oakley, MA, FRCA, MRCGP
Consultant in Anaesthesia and Trauma, North Staffordshire Hospital, Stoke-on-Trent, UK; Senior Research Fellow, Keele University

Learning objective: *To reflect on the organisational changes we need to make for effective trauma care; to embrace more fully new clinical practices, such as permissive hypotension and damage control; and to respond to the new opportunities offered by a better understanding of information technology and team ergonomics.*

The ancient art of trauma care continues to evolve. The nature of trauma itself sets the agenda for our efforts, demanding competence, commitment, and cooperation. We already know many of the answers needed to make further improvements in trauma care. In countries without established trauma systems, more can be achieved by organisational change than the application of new knowledge. The key components of an effective trauma system are well understood, based mainly on studies in North America.[1] Despite cultural differences, this kind of organisational structure can be transferred at the generic level, if not in fine detail, to other countries.

While it remains uncertain how we should staff our trauma team in all its forms from the scene, through the emergency department, to the operating theatre, and beyond, one thing is clear: commitment to trauma care is as important as the specialty background of its proponents. In addition, a legal mandate, supported by the local population, is needed to 'officialise' triage decisions and referral patterns.

However we set up our systems, we must address the need for continuity. In the trauma systems in North America, Germany, and Austria, trauma surgeons (derived from general surgery in North America and orthopaedics in Europe) have succeeded in providing continuity, despite the pressures of increasing specialisation. Elsewhere, emergency physicians, anaesthesiologists, orthopaedic surgeons, and general surgeons must examine their working practices to fill this gap. We must also centralise severe trauma, as far as our geography will allow. Without high-volume centres with all the relevant specialties in house, we are unlikely to achieve and maintain world-class levels of expertise.

New solutions relating to permissive hypotension are well established in principle, even if they are not universally applied. This approach has been extended to patients with head injuries complicated by uncontrolled haemorrhage elsewhere.[2] A philosophy of damage control surgery has been adopted and extended to musculoskeletal trauma.[3] Awareness of abdominal compartment syndrome has radically altered surgical practice. New developments in imaging and in digital technology are promising new, if sometimes costly, solutions.

Biochemical and genetic solutions have yet to have their day. The benefits of survival they will undoubtedly bring will be balanced by ethical burdens we must face in the future.

We remain uncertain about the best way of clearing the spine in obtunded patients, though several solutions have been suggested.[4] We are tempted to image more completely using both benign and potentially harmful radiation, but we are ambivalent about the extra information and its attendant cost. Will it provide more signal, or just more noise and delay?

We are hampered by poor data collection methods, an issue that is being addressed at the international level by new database designs. Several problems continue to limit our ability to compare centres. Validating data, restricting what is collected but capturing it completely, and extending statistical methods to deal better with any missing data are currently areas of concern. We now recognise mortality as a poor discriminator between centres, unmasking the need to develop better measures of morbidity and disability.

As we learn more about effective team care and realise the need for specialist information throughout the chain of care, communication skills and the innovative use of digital technology will be critical in producing a comprehensive solution. If data capture, validation, and interpretation can keep pace with the technology, this will surely be a prolific source of new ideas and ergonomic solutions, though it will subject us as individuals to uncomfortable scrutiny along the way, as our every move is watched.

References

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The Patient is Bleeding and in Hemorrhagic Shock! Now What?
Charles William Schwab, MD
Philadelphia, PA, USA
[abstract not available]

Trauma Nursing in Scandinavia—More Than Just a Vision!
Kerstin Sluys, RN
Stockholm, Sweden
[abstract not available]