High quality acute care for the severely injured is not consistently available in England, Wales and Northern Ireland:

Report of a survey by the Trauma Committee, The Royal College of Surgeons of England

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ABSTRACT

INTRODUCTION A survey was undertaken to determine the extent to which acute hospitals in England, Wales and Northern Ireland were meeting the acute trauma management standards published in 2000 by The Royal College of Surgeons of England and the British Orthopaedic Association.

METHODS A questionnaire comprising 72 questions in 16 categories of management was distributed in July 2003 to all eligible hospitals via the link network of the British Orthopaedic Association. Data were collected over a 3-month period.

RESULTS Of 213 eligible hospitals, 161 (76%) responded. In every category of acute care, failure to meet the standards was reported. Only 34 (21%) hospitals met all the 13 indicative standards that were considered pivotal to good trauma care, but all hospitals met at least 7 of these standards. Failures were usually in the organisation of services rather than a lack of resources, with the exception of the inadequate capacity for admission to specialist neurosurgery units. A minority of hospitals reported an inability to provide emergency airway control or insertion of chest tube. The data have not been verified and deficiencies in reporting cannot be excluded.

CONCLUSIONS The findings of this survey suggest that high quality care for the severely injured is not available consistently across England, Wales and Northern Ireland, and appear to justify concerns about the ability of the NHS to deal effectively with the current trauma workload and the consequences of a major incident.

KEYWORDS

Trauma – Severe injury – Acute care – Survey

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Injuries continue to be a major cause of death and disability in the UK. Most injuries occur on the roads, with around 3500 people killed and 40,000 seriously injured every year.¹ By 2020, injuries in children and young adults are forecast to overtake infections in the world burden of disease.² Although developments such as Advanced Trauma Life Support training did improve the quality of emergency care

and contributed to better survival rates in the 1980s, recent evidence suggests that these improvements have now plateaued.³ There is strong evidence of variation in severity adjusted trauma survival rates³ and it is generally agreed that there is a need to ensure a high standard of care consistently across the country. This has become a high priority given current concerns about the potential for

terrorist activities. The Council of The Royal College of Surgeons of England recognises the important role that the College has to play in achieving a state of readiness as a matter of urgency.

The joint publication in 2000 by The Royal College of Surgeons of England Trauma Committee and the British Orthopaedic Association of *Better Care for the Severely Injured* was a seminal step towards establishing high standards of trauma care across the UK.⁴ Recently, the Trauma Committee undertook a survey by questionnaire of all acute hospitals in England and Wales, in order to determine the extent to which they are complying with these standards. The results are reported here.

Methods

To measure compliance with *Better Care for the Severely Injured*, a questionnaire was constructed using standards in that publication selected by the Trauma Committee. Additional questions about the process of acute care in participating hospitals were included in the questionnaire. In July 2005, the questionnaires were distributed via the British Orthopaedic Association's network of link-surgeons, who were asked to ensure that the forms were completed by themselves or by competent colleagues. The data were collected over a period of 3 months and analysed by the Clinical Effectiveness Unit of The Royal College of Surgeons of England.

Results

Study base

In England, Wales and Northern Ireland, 213 acute hospitals have accident and emergency facilities that receive major trauma cases and were deemed eligible to participate. From these, 161 questionnaires were returned (76% response rate), 149 (92%) from England, nine from Wales (6%) and three from Northern Ireland (2%). A consultant completed 89% of the forms, and 80% were completed by a member of the orthopaedic department. The results presented below sometimes use a denominator of fewer than 161 hospitals as some questions did not apply to all hospitals, and because complete responses to some questions were not received from all hospitals.

Pre-hospital communication

At 98% of hospitals, there is a communication system with the ambulance department for advanced warning of an injured patient; in 82% of these hospitals the notification follows agreed guidelines.

Trauma teams

Multidisciplinary hospital trauma teams are well established in the surveyed hospitals (82%), usually being led by a higher

surgical trainee (72%). Only 15% of these teams are led by a consultant. In most hospitals with a trauma team, the team leader has an ATLS qualification (87%), and an experienced anaesthetist is part of the team (98%). Three trauma teams report that they have neither an experienced anaesthetist in the team nor an alternative team member able to provide emergency airway control. Further, one hospital reports that they do not have 24-hour capability to secure an airway and provide mechanical ventilation.

Head injury

In all but one hospital there is 24-hour direct access to an on-site CT scanner. Another hospital reports access to 24-hour CT scanning, but no on-call radiologist is available to review an urgent head CT. Neurosurgery is on-site at 12% of the surveyed hospitals. Of those hospitals where neurosurgery is not available on-site, 13% do not have in place an effective image transfer facility with a neurosurgical unit.

When evacuation of an acute subdural or extradural haematoma is indicated, only 12% of hospitals report that they 'always' achieve this within 4 h from the time of onset of impaired consciousness. Not surprisingly, the 4-h target is more likely to be reached when neurosurgery is available on-site (41%) than when it is not (8%).

Only 9% of hospitals without neurosurgical facilities routinely transfer all patients with a severe head injury to a neurosurgical unit. In the 106 remaining hospitals, failure to transfer is usually due to a local neurosurgical unit policy that only patients requiring an operation are admitted (72%) and/or to a shortage of neurosurgical beds (25%).

Where patients are accepted for transfer to a neurosurgical unit, the most senior doctor is a consultant in only 13% of transfer teams. The specialty most commonly represented in transfer teams is anaesthesia (96%).

Cardiothoracic injury

All reporting hospitals indicate that they have 12-lead electrocardiography available in the A&E Department and only one hospital reports that pulse oximetry is unavailable in A&E. However, serial blood gas analysis is not available in 14 hospitals (9%) and mobile ultrasound/echocardiography to identify pericardial effusion is not available in 40 hospitals (27%). Three hospitals report that they do not have the ability to provide chest tube placement and pericardiocentesis in the A&E Department, and 55 hospitals (36%) do not have 24-hour availability of a surgeon able to perform a resuscitative thoracotomy.

Abdominal injury

In 45 hospitals (30%), abdominal ultrasound is not rapidly available on a 24-hour basis but only three hospitals do not have abdominal CT available 24-hours. In three hospitals, a senior general surgeon able to perform life-saving

emergency surgery is not available 24-hours, and only 25% of hospitals report that emergency laparotomy is 'always' achieved within 60 min of admission when indicated.

Skeletal and soft tissue injuries

Most of the surveyed hospitals (72%) do not have plastic surgery for significant tissue defects available on site. Fifteen hospitals (14%) are unable to achieve wound debridement for patients with an open fracture within 6 h of injury and 15 (14%) do not normally achieve restoration of the soft tissue envelope within 5 days of injury; none of these hospitals has plastic surgery on site.

Pelvic injuries

Most hospitals (78%) do not have a specialist pelvic surgeon available. Of these, 13 hospitals do not have the skills available to apply a pelvic external fixator rapidly, and 25 hospitals do not have arrangements for immediate consultation with a pelvic trauma unit.

A majority of hospitals (62%) report that they do not have 24-hour access to emergency angiographic embolisation. Of hospitals with a specialist pelvic surgeon on site, 94% report that they 'always' or 'usually' achieve pelvic reconstruction within 10 days of trauma; this compares to only 61% in hospitals with no such expertise.

Spinal injuries

Most units (90%) have a policy for full spinal clearance for assessable patients, although fewer (73%) have such a policy for the non-assessable patient. Fourty percent of hospitals report that they do not remove patients from the rigid spinal board within 30 min of arrival at the A&E Department.

Five hospitals do not have emergency spinal CT scanning available within 4 h of injury for patients with neurological deficit; for patients with other unstable injuries, four hospitals report that they do not obtain emergency spinal CT scanning within 12 h. A specialist spinal surgeon is not available on site in 61% of hospitals and 29% of these hospitals report that they do not have agreed arrangements with a specific unit for urgent referral of patients with unstable spinal injuries and neurological signs.

Complex hand and brachial plexus injuries

Around half of the surveyed hospitals (55%) have arrangements in place for operating on complex hand injuries by a hand specialist within 6 h of injury. Only 12% of hospitals have a specialist in brachial plexus injuries on site. Of the remainder, 21% (27 hospitals) do not have arrangements in place for off site consultation.

Vascular injuries

A specialist vascular surgeon is rapidly available in 72% of

the surveyed hospitals. Where there is no vascular surgeon on site, nine hospitals (23%) report that they are unable to refer and transfer to a vascular surgeon within 2 h, and three hospitals (9%) report that they are unable to achieve limb reperfusion within 6 h of injury.

Urology

Most hospitals reported that they have emergency access to a urologist (93%) with 10 hospitals reporting no such access.

Maxillofacial

Around half (47%) of hospitals do not have specialist maxillofacial surgeons available on-site. Where this speciality is not available on-site, only two hospitals report that they do not have arrangements for prompt consultation/transfer.

Eye injuries

Over half of UK hospitals (63%) have on-site access to an experienced ophthalmologist for examination under anaesthesia. Of those where there was no ophthalmologist on-site, two hospitals report that they do not have arrangements in place for prompt consultation/transfer.

Anaesthesia

Five hospitals do not have the facilities and skills available 24-hours for immediate crico-thyroidotomy. Three hospitals report that they do not have an experienced anaesthetist immediately available and one hospital does not have an appropriately trained operating department practitioner or trained anaesthetic nurse available 24-hours.

Intensive care

Most hospitals (85%) have a specialist registrar or consultant in intensive care available to attend A&E for a major trauma patient and a similar proportion (86%) have an inter-hospital transfer team with experienced staff and appropriate equipment.

The severely injured child

A quarter of all surveyed hospitals report that they do not have a dedicated resuscitation area for children in A&E. Half (49%) report having a trained children's nurse in A&E at all times. An Advanced Paediatric Life Support (APLS) certified specialist registrar or consultant in paediatrics/paediatric ITU is routinely called as part of the trauma team in 74% of hospitals. Advice from a specialist paediatric surgeon or other paediatric specialist is not immediately available in 34 hospitals (23%). Where such advice is available, the paediatric specialist is on-site in 46% of hospitals. Most hospitals have immediate access to advice from a specialist paediatric intensive care unit

Table 1 Indicative standards and the number of hospitals that failed to meet them

Indicative standard	No. of hospitals not meeting standard
1 A communication system with the ambulance service to enable advanced warning to be given of an injured patient	13
2 A structured, multidisciplinary trauma team	28
3 An individual trained in the emergency care of children in the trauma team when a severely injured child is admitted to A&E	37
4 24-hour ability to secure an airway and provide mechanical ventilation	1
5 Direct access to 24-hour CT scanning on site	1
6 An effective image transfer facility with a neurosurgical unit	17
7 Ability to provide chest tube placement and pericardiocentesis in the A&E Department	3
8 A senior general surgeon always available to perform life-saving emergency surgery	3
9 Skills available for applying a pelvic external fixator rapidly	13
10 Emergency angiographic embolisation available 24-hours	88
11 Ability to achieve limb reperfusion within 6 h of injury	5
12 An appropriately trained ODP or anaesthetic trained nurse available 24-hours	1
13 Immediate access to advice from a specialist paediatric intensive care unit	21

(86%); however, in only 16% of these hospitals was the PICU on site. In 44% of hospitals without a specialist paediatric surgical unit, it is reported that local surgeons 'always' or 'usually' operate on children.

Audit

The hospitals' trauma management process is discussed at regular multidisciplinary trauma audit meetings in only half of all surveyed hospitals (55%) and outcomes are not available at the meeting in 18% of these hospitals. Only 60% of hospitals report that they submit data to the Trauma Audit and Research Network.

Indicative standards

To quantify compliance with standards in trauma care, we have aggregated the number of hospitals that meet 13 indicative standards selected by consensus by the Trauma Committee. These standards and the number of hospitals that failed to meet them are shown in Table 1. Of the 161 hospitals surveyed, these indicative standards were met as follows:

- 34 hospitals (21%) met all 13 indicative standards
- 64 hospitals (40%) failed only one standard
- 41 hospitals (25%) failed two standards
- 12 hospitals (7%) failed three standards

6 hospitals (4%) failed four standards

3 hospitals (2%) failed five standards

1 hospital failed six standards.

No hospital failed seven or more of these standards.

Limitations of study

The persons completing the questionnaire varied in terms of their discipline, speciality and grade. In addition, the quality of the reported data has not been validated. The findings, therefore, should be interpreted with caution.

Discussion

Overall, we found that where the standards published in *Better Care for the Severely Injured* were not met, the deficit was usually in the organisation of services rather than a lack of equipment or facilities, with the notable exception of inadequate resources for admission to specialist neurosurgery units. In a minority of hospitals there were important deficiencies, in particular an inability to provide emergency airway control or insertion of chest tube.

This survey demonstrates that many of the deficiencies in UK trauma care that led to the publication of *Better Care for the Severely Injured* have still to be addressed. To improve our management systems, the care of the severely

injured patient needs to be given prominence on the NHS political agenda, and a higher profile with politicians, the public and medical practitioners. Many countries have developed national or regional accreditation systems for the care of the severely injured patient, but a robust network of Regional Trauma Care Systems has failed to develop in the UK. Indeed, the increasing devolution of healthcare decision making to a more local level may make it increasingly difficult for the necessary Regional or Supra-Regional Trauma Networks to develop. This is an area of healthcare where central national planning is required.

Conclusion

On the evidence presented, concerns over the state of readiness of the NHS for dealing with the normal trauma workload, let alone the consequences of a major disaster, appear to be justified.

Acknowledgement

This survey was supported by a grant from the Department of Health, London.

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Erratum

TECHNICAL TIP *Ann R Coll Surg Engl* 2006; **88**: 78

doi 10.1308/147870806X95195

Arthroscopically-assisted percutaneous fixation of a posterior fracture dislocation of the proximal humerus

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We apologise for omitting the senior author's name (Mr Sjolín) from the above technical tip. The correct authorship is given above.