

TRAUMA ✓ VERIFICATION

BENCHMARKING TRAUMA CARE

THE AUSTRALASIAN TRAUMA VERIFICATION PROGRAM MANUAL

August 2009



Royal Australasian College of Surgeons

Australasian Trauma Verification Program

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Australasian Trauma Verification Program

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Australasian Trauma Verification Program

Summary

What is Trauma Verification?

The Australasian Trauma Verification Program is a multi-disciplinary inter-collegiate process, developed through the Royal Australasian College of Surgeons to assist hospitals in analysing their system of care for the injured patient.

The review covers pre-hospital through to discharge from acute care and identifies the strengths and weaknesses of the hospital's trauma service.

Why do we need Verification?

- Evidence of the need to improve trauma services in Australasia
- Evidence of improved outcomes and reduced length of stay in institutions which have undergone Verification
- Literature exists regarding the benefits of Trauma Verification and impact on patient outcomes

How has the Trauma Verification Program been established?

- Seeding grant from Royal Australasian College of Surgeons (RACS)
- Multidisciplinary committee with support of relevant Colleges which includes surgeons, emergency physicians, intensivists, anaesthetists and nursing staff
- The Australasian Trauma Verification Manual (including the pre-review questionnaire and Model Resource Criteria prepared by the multi-disciplinary Verification Working Party)

What has been achieved?

- Intercollegiate cooperation
- Revision of standards for trauma care in Australasia
- Many Verification reviews in most Australian States and Territories
- Development of Trauma Verification expertise
- Positive feedback from hospital trauma directors undergoing a review
- Whole of service review of Northern Territory Acute Health Services in 2004

Future Directions

- Refinement of standards as evidence emerges
- Ongoing multidisciplinary support
- Verification of non-major trauma care providers
- Closer alliance with purchasers of trauma care (E.g. Departments of Health)

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Development of the Program

Introduction

Verification of trauma services providing care to the severely injured patient is an exciting advance in trauma care in Australasia. There is overwhelming evidence that trauma services in many jurisdictions in Australasia need to be dramatically improved. This is why we need Verification.

Other health-care delivery systems have undergone an accreditation process with dramatic improvement in results. An excellent example is the breast screening program.

Beginnings

In March 2000, under the chair of Dr Jim McGrath, a multi-disciplinary group of committed clinicians was assembled to form the Trauma Verification Sub Committee. Utilising a seeding grant of \$50,000 from the Royal Australasian College of Surgeons, a pilot program of six consultation visits was conducted over 24 months in Australasia.

The Verification process has used overseas visiting trauma clinicians and Australasian trauma clinicians and has borrowed from the Verification experience of the American College of Surgeons Committee on Trauma (ACS CoT). In the United States, the Verification process has been active for almost 20 years and has undergone considerable evolution.

The Australasian Trauma Verification Sub Committee has been most grateful for the support from the ACS CoT who has provided much guidance. They have also allowed Trauma Verification Sub-Committee members to attend both the ACS CoT Verification Review Committee meetings and observe on Verification visits to hospitals in the United States.

It is important to note the difference between the ACS CoT Verification program and the Australasian Verification program – namely the Australasian program's involvement of clinicians other than surgeons which brings a broader and more collegial emphasis to Verification.



Designation

Verification is aimed at improving the quality of care and not deciding which institutions should manage major trauma.

Trauma Verification does not designate which hospitals receive major trauma. Major trauma services are designated by either the regional health service or the state Departments of Health.

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Trauma Verification Sub Committee Structure

The Trauma Verification Sub-Committee is a Sub-Committee of the Trauma Committee of the Royal Australasian College of Surgeons. Despite the very close links with the Royal Australasian College of Surgeons, the Verification Sub-Committee is a truly multi-disciplinary Inter-Collegiate process. The partners in the Verification process are:

- 1 RACS – Royal Australasian College of Surgeons
- 2 JFCIM – Joint Faculty of Intensive Care Medicine
- 3 ACEM - Australasian College for Emergency Medicine
- 4 ATS - Australasian Trauma Society
- 5 Nursing representatives

Members of the Trauma Verification Sub-Committee

Dr Arthas Flavouris (Chair)	Joint Faculty of Intensive Care Medicine
Dr Damian McMahon	Royal Australasian College of Surgeons
Mr Chris Atkin	Royal Australasian College of Surgeons
Prof Danny Cass	Royal Australasian College of Surgeons
Dr Scott D'Amours	Royal Australasian College of Surgeons
Assoc Prof Peter Danne	Royal Australasian College of Surgeons
Ms Trish McDougall	Australasian Trauma Society
Dr Frank Miller	Royal Australasian College of Surgeons (Rural Representative)
Dr Colin Myers Medicine	Australasian College for Emergency
Ms Louise Niggemeyer Representative	ATS Trauma Nurse Coordinator
Dr Peter Bautz	Royal Australasian College of Surgeons
Mr Grant Christey	Royal Australasian College of Surgeons

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The Program

Pre-Review Questionnaire

Each institution undergoing a Consultation or Formal Verification visit completes a pre-review questionnaire which details the strengths and weaknesses of the trauma services. The pre-review questionnaire allows the site review team to focus on those particular issues relevant to that service. A copy of the pre-review questionnaire can be accessed at the Trauma Verification website at www.surgeons.org/traumaverification.

Consultation vs. Formal Verification

Trauma Verification is developed as a way of assisting each individual institution to benchmark its trauma services. It does not seek to 'pass or fail' the trauma service. The Trauma Verification Sub Committee provides encouragement and support during the review process and, as practicing trauma clinicians, the Committee understands the demands and challenges placed on trauma services throughout Australia and New Zealand.

The objective of a Trauma Verification Consultation visit is to provide a constructive review of the trauma service and identify areas where the service would be unable to meet the criteria stipulated if undergoing Formal Verification. It can be used to improve the trauma service or as preparation for Formal Verification. Every trauma service is recommended to undergo a Consultation Verification visit prior to the more rigorous Formal Verification visit. A Consultation Site Visit requires a two-three member team to conduct the review.



A Formal Trauma Verification visit has the objective of determining the areas a trauma service is unable to meet stipulated criteria. It has a full multi-disciplinary team of usually five members which reviews all areas of delivery of trauma care within the hospital.

Site Review

A team of five reviewers conducts the site review for a Formal Trauma Verification visit and a two-three member team is required for a Consultation visit. The team is multidisciplinary, reflecting the broad range of clinical care required by the multiply injured patient.

The team reviews the pre-review questionnaire with the key trauma service personnel on the evening prior to the visit, undertakes a detailed tour of the facility, meets key clinicians and hospital management and conducts medical chart reviews to verify the quality of trauma care being provided.

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Reporting Mechanism

At the immediate completion of the site review the institution receives verbal feedback from the team leader of the Verification team.

Each institution undergoing either a formal Trauma Verification visit or a Consultation visit receives a comprehensive written report.

The report is submitted to the Trauma Verification Sub-Committee for final approval before being sent to the authorising body and/or the trauma director and hospital administration.



Funding

The initial funding for the Trauma Verification process was via a grant from the Royal Australasian College of Surgeons of \$50,000.

The Trauma Verification Program seeks to be self funding but its ongoing viability can only rely on the number of hospitals undergoing the Program.

Website

The Trauma Verification Program maintains a comprehensive webpage with up to date and relevant information regarding the program. For further information, please visit www.surgeons.org/traumaverification

Benefits of the Trauma Verification Program

The Trauma Verification process has enabled institutions to demonstrate in a substantive way their commitment to the provision of care to the seriously injured patient. There is evidence from the United States of the benefits of Verification in reducing patient mortality and morbidity and increasing the efficiency with which hospitals deliver trauma care.

It has also been reported that participation as site review team members by experienced senior trauma clinicians (medical and nursing) has permitted an exchange of ideas and appreciation for solutions to shared challenges.

The process of preparation for a Trauma Verification Formal or Consultation visit has been described by the individual institutions undergoing Verification as highly productive. It has provided an opportunity to critically evaluate the structure, staffing and resources within each individual institution providing care for the major trauma patient.

It has been reported that the Trauma Verification process has enabled institutions to acknowledge in a substantive way their commitment to the provision of care to the seriously injured patient.

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Achievements of the Program

Intercollegiate Cooperation

The cooperation between the different clinical disciplines involved in care of the major trauma process has been one of the successes of the program to date.

Revision of Standards for Trauma Care in Australasia

The Model Resource Criteria for major trauma services were developed beginning with a workshop sponsored by Royal Australasian College of Surgeons in December 2000. The workshop was well attended and received participation from a broad range of clinicians involved in major trauma care. Important documents which formed the framework for the development of the current version of the Model Resource Criteria include:

- *Resources for Optimal Care of the Injured Patient: 1999*, Committee on Trauma American College of Surgeons (The Gold Book)
- *Report of the Working Party on Trauma Systems*, National Road Trauma Advisory Committee, (NRTAC) 1993
- *Review of Trauma & Emergency Services – Victoria 1999*, (ROTES Report)

Consultation Visits

Six hospitals undertook Trauma Verification in 2000/2001 as part of the pilot project.

These were:

Liverpool Hospital, NSW
New Children's Hospital, NSW
The Alfred Hospital, VIC

Royal Adelaide Hospital, SA
Westmead Hospital, NSW
John Hunter Hospital, NSW

Development of Trauma Verification Expertise

Undertaking a critical peer review of a trauma service requires a new skill and so far over 20 clinicians have been initiated in these skills. As the program advances further, more reviewers will be trained.

Evaluation, Research and Reporting

Ongoing Evaluation and Reporting

As part of its commitment to the enhancement and growth of the program, the Trauma Verification Sub Committee has commenced data gathering exercises.

As part of those exercises the Sub Committee seeks to include descriptors of the hospitals that have participated in either Formal and/or Consultative reviews. It is intended to generate manuscript(s) for appropriate peer reviewed journals, oral presentations at selected scientific meetings and reports that may interest those involved in the care of the injured patient.

The Sub Committee considers this to be an important step for the progression of the Trauma Verification Program in addition to providing useful information to those interested in trauma care.

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Feedback

All trauma program directors who have undertaken a Trauma Verification Formal or Consultation visit are surveyed one year after the visit to assess the impact on the trauma services. It is anticipated that as Trauma Verification Formal visits follow Consultation visits, evidence of the impact of the process in improving quality of care and trauma patient outcomes will be generated.

Reports from trauma service directors regarding the impact of Verification have been very positive. The following comments from trauma directors demonstrate the immediate value of a Trauma Verification or Formal Consultation visit:

“Thirty five weaknesses in our Major Trauma Service were identified from the Verification Report, most of which have since been corrected. Verification has been the single most helpful and practical exercise I have undertaken in my experience in Trauma. It is the most effective tool to improve and upgrade a trauma service – both in terms of the relatively low-cost to the hospital and as a practical guide to problem solving”

“It highlighted to administration and the rest of the hospital the complexity of trauma management and how it requires a multidisciplinary team”

“the best thing that has happened in trauma care”

“it identified areas of weakness that we were unaware existed”

“it emphasised the need for action”

“an extremely rewarding and informative exercise”

“Verification highlighted to hospital management the quality of work done by all those involved in the care of the multi-injured patient”

Costs to undertake a Trauma Verification Review

The cost of Trauma Verification can be recouped in better patient outcomes, fewer complications and shorter hospital stays. For instance, a saving of just 3–4 ICU bed days on **one** patient pays for the entire Verification visit.

The fees for Trauma Verification are determined by the type of visit.

- Trauma Verification Formal Review fee: \$13,500
- Trauma Verification Consultation Review fee: \$11,500

The hospital undertaking Trauma Verification is required to reimburse the Program for travel and accommodation expenses (domestic and New Zealand airfares and overnight accommodation for interstate review team plus an additional night's accommodation for the team leader to prepare the report).

The hospital is also required to organise pay for a Pre Review meeting/dinner at a local restaurant (approximately 12 people).

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Future Directions of the Program

Ongoing Multidisciplinary Support

Maintenance of the multidisciplinary support, from all the Colleges, is important to the continuing success and future of the Verification Program.

Verification of Non-Major Trauma Care Providers

As broader Verification expertise develops, smaller review teams will be able to consult and verify non-major trauma services. The Trauma Verification Program allows for Trauma Verification to be applied at the level of a single institution or a health region. It also allows for the measurement of improvement over time.

Closer Alliance with Purchasers of Trauma Care

Clear liaison and reporting mechanisms with the trauma care funding providers is necessary. Ultimately the quality of care information gleaned from Verification might be used by designating agencies but the way in which such information is transferred must be transparent and agreed upon.

Case Study

Northern Territory Review of Acute Trauma Services

In December 2004, the Australasian Trauma Verification Program conducted a review of trauma services across the Northern Territory. Clinical care in five hospitals which included Royal Darwin, Alice Springs, Katherine, Tennant Creek and Gove Hospitals was compared to those outcomes achieved in other comparable hospitals in Australasia

The unique challenges of delivering high-quality trauma care in the Northern Territory were acknowledged. These include a sparse population spread over an enormous geographic area and population health issues and injury in this jurisdiction such as high-speed motor vehicle crashes, isolated roads and alcohol abuse.

The commitment and enthusiasm of the clinical staff met during this review was outstanding. The clinical outcomes observed were generally of a high order and in most instances, were timely and appropriate.



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Model Resource Criteria

The methodology and the criteria upon which the Trauma Verification Program is based have been developed through a multidisciplinary, cooperative approach. This process was initiated at the Trauma Verification Workshop in December 2000. The resource criteria are deemed either *essential* or *desirable* for a trauma service in Australasia.

The Model Resource Criteria is a continually evolving document and where possible, evidence supporting inclusion for the criteria is listed. However, many of the essential criteria for provision of major trauma care in the Australasian hospital environment remain a consensus statement rather than inclusion based on a high level of evidence drawn from randomised controlled clinical trials.

These Resource Criteria were adopted and revised from:

- a. The American College of Surgeons Verification Resources criteria (for more information see American College of Surgeons website <http://www.facs.org/trauma/verificationhosp.html>)
- b. The National Road Trauma Advisory Council (NRTAC) resources criteria (for more information see <http://www.surgeons.org/Content/NavigationMenu/FellowshipandStandards/FellowshipServices/Trauma/Publications/NRTACTraumaReport1993.pdf>)
- c. The Review of Trauma & Emergency Services Victoria 1999 - ROTES Report (see <http://www.health.vic.gov.au/trauma/>)

For further references, see end of document.

Legend for the Model Resource Criteria:

E/D – Essential or Desirable

Ascertain – confirm either by review of existing documentation, direct inspection, interview of staff, test of procedure (e.g. mock trauma team activation) or through medical record review.

For a separate copy of the Model Resource Criteria or the appendices referred to in it please contact:

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Descriptors of Levels of Trauma Services:

Level I

A Level I Trauma Service will be capable of providing the full spectrum of care for the most critically injured patient, from initial reception and resuscitation through to discharge and rehabilitation. As well as this the Level I Service provides:

- Research
- Education & Fellowship training
- Trauma Systems overview
- Quality improvement program
- Data collection
- Prevention and outreach programs
- Trauma audit
- Leadership responsibilities

A Level I Trauma Service will have significant case volumes to sustain clinical excellence. There will be a 24 hour trauma reception team, prompt 24 hour availability of senior consultant level general surgeon, an appointed trauma director and, ideally, a surgical trauma admitting service (bed card). Elective and Emergency surgery in neurosurgery, cardiothoracic, orthopaedics and plastics are essential.

A Level I service will essentially have first class facilities including emergency department, operating theatre suite, and intensive care units, with dedicated emergency O.R. availability 24 hours for Trauma.

A Level I centre should be the 'central hub' of an integrated system, with responsibility for coordination of other services both urban and rural in any given region, and for advising such Trauma Services. Transfer agreements for reception of patients from those other Trauma Services should be in place. A helipad landing site is essential as well as road and ambulance reception.

A Level I centre will take a lead role in the coordination and management of mass casualty and disaster preparedness scenarios. A Level I hospital acts as the principal hospital for reception of inter hospital transfer of major trauma patients.

Level II

A Level II service can be either metropolitan or rural based. Level II hospitals should provide comprehensive clinical care for the severely injured patient to supplement the clinical activities of Level I services in population dense areas. The clinical aspects of care for the injured patient should be identical to that of a Level I service without the additional leadership, research and education components. A Level II service must have a surgeon available in all specialties commensurate with Level I and consistent 24 hour availability of neurosurgical and cardiothoracic services.

A Level II service will have a high level ICU trauma team response and operating suites, with 24 hour availability. There will be an appointed Director of Trauma.

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For those Level II centres located in non-metropolitan areas, there will be an important role in the coordination of the management of trauma throughout their region, and an educational role. Transfer agreements must be clearly delineated to enable the appropriate and expeditious transfer of major trauma patients to Level I hospitals when required. An on-site helicopter landing site is essential.

Level III

The major role of a Level III service is the provision of high quality care to medium and minor level trauma, with the capability of stabilising major trauma patients who cannot be transported directly to Level I services. It can provide definitive care to a limited number of major trauma patients, in concert, with the regional Level I Trauma Service. In general terms Level III services will be able to provide prompt assessment, resuscitation, emergency surgery, and stabilisation of a small number of seriously injured patients, while arranging for their transfer to the responsible Major Trauma Service.

A Level III service can provide all aspects of immediate care, including some definitive care for non-major trauma patients according to patient needs and available resources. It will have a consistent general surgical service which also provides most aspects of definitive care to severely injured patients. Its principal function, with respect to major trauma, is to provide initial resuscitation and operative stabilisation, prior to appropriate early transfer of major trauma patients, who have attended because of being outside the catchment area of Level I or Level II Trauma Service.

A Level III service will have established transfer agreements with the Level II and Level I Trauma Services. It will require the 24 hour availability of an on-duty specialist surgeon and anaesthetist, as well as a nurse experienced in the care of trauma and radiology facilities. Helicopters should be able to land safely nearby. There will be a varying capacity amongst Level III services for the provision of emergency surgery.

Level IV

Level IV is a resuscitating hospital where the major trauma patient is transferred out as soon as possible. A medical doctor needs to be in attendance within half an hour. Level IV services are not intended to care for major trauma patients, but are recognised because they participate in the care of minor trauma, and because, on occasions, individual patients, may self present, with major trauma, or in rural situations there may be an occasional need for resuscitation of a major trauma patient, with rapid transfer on. Guidelines should exist for this management and transfer process.

In a metropolitan area, Level IV centres may be large, mature tertiary institutions, which are not designated for trauma care specifically. In the rural setting these institutions will usually be very small and isolated hospitals or medical centres, with no immediately available medical practitioner, and minimal radiology or acute care facilities.

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Model Criteria	I	II	III	IV	Criteria Specifics
Pre Hospital					
Triage protocols	E E	E D	E	E	1. Monitor triage of patients & provide feedback. 2. Involvement in developing regional triage guidelines in collaboration with pre-hospital provider.
Communications with medical officers	E	E	E	D	Direct communication between hospital medical & treating ambulance officer must be both possible & regularly used to pre-notify details of all seriously injured patients
Site Medical team capacity	E	D E Rural	D E Rural		Composition of team task specific
Helipad	E	D	D E Rural		Rural should have helipad
Helipad security and safety procedures	E	E	E		
Operating procedure manual	E	E	E		Interaction with helipad / transport providers
Medical Retrieval Capacity	E	E Rural D Metro	E Rural D Metro	D Rural based, for scene response only	JFICM, ANZCA, RACP Doc IC-10 <i>Minimum standards for transport of critically ill patients</i> . Linked into minimum standards for retrieval services. Appendix 1 www.jficm.anzca.edu.au www.anzca.edu.au
Medical director of trauma service	E F/T	E P/T	E P/T		Need role description for P/T trauma directors - Appendix 2
Deputy Trauma Director	E	D	D		Need roles and responsibilities job description
Trauma coordinator	E	E	D		As for Trauma Director - Appendix 2
Trauma Fellow	E				Provide job description
Data Manager	E	E	D		Provide job description
Trauma Database	E	E	E	E	May be a regional database
Trauma Service Clerical staffing	E	E	E		Provide job description
Hospital Trauma Committee	E	E	E		Meeting dates and minutes - Appendix 3
Area/Regional Trauma Committee	E	E	D		Meeting dates and minutes - Appendix 3
Designation of the trauma service	E	E	E	E	Clarify from Trauma Director and/or medical Administration
Organisation chart	E	E	E	E	Needs structure and view chart
Trauma Admit Bed Card					
Trauma Admit Bed Card	E	D			Provisional & subject to next review
Number of Major Trauma patients ISS >15					
No of major trauma patients with ISS>15	>250 D	>200 D	>80 D		
Patient Transport					

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Model Criteria	I	II	III	IV	Criteria Specifics
Capability of in hospital transportation of patients according to ANZCA/JFICM/ACEM criteria	E	E	E	D	Defined process and responsibility and allocated equipment JFICM Doc IC-10 <i>Minimum standards for transport of critically ill patients</i> , Appendix 5 ANZCA Doc PS-39 <i>Minimum standards for intrahospital transport of critically ill patients</i> , Appendix 6 www.jficm.anzca.edu.au www.anzca.edu.au
Emergency Department					
General criteria as established by ACHS accreditation guide	E	E	E	D	As assessed by ACHS accreditation process
Accreditation criteria specified by ACEM	E	E	E		As assessed by ACEM accreditation process ACEM Docs S18 <i>Statement of responsibility of care in emergency department</i> , Appendix 6 P15 <i>Emergency department design guidelines</i> , Appendix 7 PO18 <i>Guidelines on responsibility for care in emergency departments</i> , Appendix 8
Documented policies & guidelines for the arrival and assessment of the trauma patient	E	E	E	E	Ascertain guidelines including a check of the trauma team response
24 hour capacity for trauma reception	E	E	E		Ascertain
Direct communication with ambulance	E	E	E	D	1. Notification 2. Communication
Single point telephone referrals	E	E	D		Dedicated line, accessible and documentation of calls
Ambulance access	E	E	E	D	Review access
Helicopter access	E	D	D		Review access
Triage on arrival	E	E	E		Review procedure
Designated ED medical director	E	E	D		Ascertain
Consultant in department 24hrs	D	D			Review process
Consultant on call 24 hours	E	E	E	D	Within 30 minutes
Medical officers with training in ATLS/EMST principles	E	E	E	E	Ascertain
Medical officers available 24hrs	E	E	E	D	Ascertain
Nursing staff with trauma training in ATLS principles	E	E	D	D	Ascertain proportion of staff trained
Adequate hospital staffing for 24hr trauma team response	E	E	D		Ascertain
Trauma team activation	E	E	E		Initiate trauma team test callout and ascertain response, team composition, understanding of roles and responsibilities and lines of communication
Single point of entry for all trauma	E	E	E	D	Review access

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Model Criteria	I	II	III	IV	Criteria Specifics
Monitoring specific to trauma resuscitation area					
Senior doctor accompanies transport from ED to Radiology/OR/ICU	E	E	E		Ascertain
Focused Abdominal Sonogram for Trauma [FAST]	E	E	D	D	Ascertain Available as part of the trauma team ACEM Doc P21 <i>Policy Document – Use of bedside ultrasound by emergency physicians</i> Appendix 17
ECG monitor & defibrillator & pacer	E	E	E	E	Ascertain Paediatric & ANZCA/JFICM/ACEM guidelines compatible ANZCA PS-9/19 <i>Guidelines on conscious sedation for diagnostic interventional medical and surgical procedures</i> Appendix 9, PS-48 <i>Statement on clinical principles for procedural sedation</i> Appendix 10 PS-39 <i>Minimum standards for intrahospital transport of critically ill patients</i> Appendix 6
Pulse oximetry	E	E	E	E	Ascertain Paediatric & ANZCA/JFICM/ACEM guidelines compatible ANZCA PS-9/19 <i>Guidelines on conscious sedation for diagnostic interventional medical and surgical procedures</i> Appendix 9, PS-48 <i>Statement on clinical principles for procedural sedation</i> Appendix 10 PS-39 <i>Minimum standards for intrahospital transport of critically ill patients</i> Appendix 6
Capnography	E	E	E	E	Ascertain Paediatric & ANZCA/JFICM/ACEM guidelines compatible ANZCA PS-9/19 <i>Guidelines on conscious sedation for diagnostic interventional medical and surgical procedures</i> Appendix 9, PS-48 <i>Statement on clinical principles for procedural sedation</i> Appendix 10 PS-39 <i>Minimum standards for intrahospital transport of critically ill patients</i> Appendix 6
Non-invasive BP	E	E	E	E	Ascertain Paediatric & ANZCA/JFICM/ACEM guidelines compatible ANZCA PS-9/19 <i>Guidelines on conscious sedation for diagnostic interventional medical and surgical procedures</i> Appendix 9, PS-48 <i>Statement on clinical principles for procedural sedation</i> Appendix 10 PS-39 <i>Minimum standards for intrahospital transport of critically ill patients</i> Appendix 6

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Model Criteria	I	II	III	IV	Criteria Specifics
Monitoring specific to trauma resuscitation area (cont)					
Invasive BP	E	E	D		Ascertain Paediatric & ANZCA/JFICM/ACEM guidelines compatible ANZCA PS-9/19 <i>Guidelines on conscious sedation for diagnostic interventional medical and surgical procedures</i> Appendix 9, PS-48 <i>Statement on clinical principles for procedural sedation</i> Appendix 10 PS-39 <i>Minimum standards for intrahospital transport of critically ill patients</i> Appendix 6
Other invasive pressure monitors	E	D	D		Ascertain Paediatric & ANZCA/JFICM/ACEM guidelines compatible ANZCA PS-9/19 <i>Guidelines on conscious sedation for diagnostic interventional medical and surgical procedures</i> Appendix 9, PS-48 <i>Statement on clinical principles for procedural sedation</i> Appendix 10 PS-39 <i>Minimum standards for intrahospital transport of critically ill patients</i> Appendix 6
Temperature including Core	E	E	E	E	Ascertain Paediatric & ANZCA/JFICM/ACEM guidelines compatible ANZCA PS-9/19 <i>Guidelines on conscious sedation for diagnostic interventional medical and surgical procedures</i> Appendix 9, PS-48 <i>Statement on clinical principles for procedural sedation</i> Appendix 10 PS-39 <i>Minimum standards for intrahospital transport of critically ill patients</i> Appendix 6
Portable multiparameter monitor	E	E	E	D	Ascertain Paediatric & ANZCA/JFICM/ACEM guidelines compatible ANZCA PS-9/19 <i>Guidelines on conscious sedation for diagnostic interventional medical and surgical procedures</i> Appendix 9, PS-48 <i>Statement on clinical principles for procedural sedation</i> Appendix 10 PS-39 <i>Minimum standards for intrahospital transport of critically ill patients</i> Appendix 6
Portable mechanical ventilator in ED resuscitation for each major trauma bed space	E	E	E	E	Ascertain
ICP	D	D			Ascertain
Compartment pressure monitor	E	D			Ascertain
CTG or link to that unit	E	D	D		Ascertain
Communication network	E	E	D	D	Ascertain
CBR	E	E	D		Review procedure & plans & ascertain previous exercises (type & frequency)
CBR decontamination facilities	E	E	D		Ascertain & review procedures
Security	E	E	D		Ascertain

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Model Criteria	I	II	III	IV	Criteria Specifics
Monitoring specific to trauma resuscitation area (cont)					
Protective clothing	E	E	E	E	Ascertain
Refrigerator – blood storage standard	E	E	D	D	Ascertain
Full range of splints	E	E	E	D	Ascertain
Delivery bundle	E	E	D	D	Ascertain
Mobile X-ray	E	E	E	D	Ascertain
ECG 12 lead	E	E	E	E	Ascertain
Field medical team kit	E	E Rural D Metro	D	D	Ascertain
Photocopier & fax	E	E	E	E	Ascertain & accessible
Internet, Email, ability to capture & transmit digital images	E D	E D Rural	E D Rural	E	Email, capture transmit still digital images Telehealth video links
Laboratory Service	E	E	D	D	Ascertain procedure for urgent blood test dispatch & result availability
24 hr a day availability of but not limited to:					
Standard analysis of blood & blood gases	E	E	E	D	Ascertain availability
Blood typing & cross-matching	E	E	E		Ascertain availability
Coagulation studies	E	E	D		Ascertain availability
Serum & urine osmolality	E	E	D	D	Ascertain availability
Microbiology	E	E	D		Ascertain availability
Drug & alcohol screening	E	E	D		Ascertain availability
Carboxyhaemoglobin	E	E	D		Ascertain availability
Explanation of CPR	E	E	E	E	Ascertain availability
Surgical instruments for procedures	E	E	D	D	Ascertain availability
X-Ray development facilities	E	E	D	D	Ascertain availability
Portability of monitoring & resuscitation equipment	E	E	D	D	Ascertain availability
Surgical Specialties					
General	E	E	D		Surgical skills (capable of emergency laparotomy & thoracotomy) 24 hrs, consultant <30mins. Ideally DSTC trained.
General Surgical input as part of trauma team response	E	E	D		Registrar/Consultant is part of trauma team response
Orthopaedics	E	E	D		Registrar/consultant (capable of emergency external fixature) <30mins
Neurosurgery	E	E			Registrar/consultant (capable of emergency craniotomy) < 30mins
Vascular	E	E			Registrar/consultant < 30mins
Plastic **	E	E			Consultant available on call 24 hr
Cardiothoracic	E	E			Consultant available on call 24 hr
Ophthalmic	E	E			Consultant available on call 24 hr
ENT **	E	E			Consultant available on call 24 hr
Maxillofacial **	E	E			Consultant available on call 24 hr
Urology	E	D			Consultant available on call 24 hr
** = Any one of these three specialties needed at Level II for facial fractures					

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Model Criteria	I	II	III	IV	Criteria Specifics
Anaesthesia and Pain Medicine					
Staffing of Department of Anaesthesia	E	E	E		According to ANZCA guidelines PS42 <i>Recommendations for staffing of departments of anaesthesia</i> , Appendix 11. Sufficient to effectively support the trauma service.
Pre-anaesthesia consultation by the anaesthetist	E	E	E		According to ANZCA Doc PS7 <i>Recommendations on the pre-anaesthesia consultation</i> , Appendix 12
Anaesthetic capability	E	E	E		According to ANZCA Docs T1: <i>Recommendations on minimum facilities for safe anaesthesia practice in operating suites</i> & T2: <i>Recommendations on minimum facilities for safe anaesthesia practice outside operating suites</i> - Appendix 13 & 14
Patient monitoring facilities	E	E	E		According to ANZCA doc PS 9/19 <i>Guidelines on conscious sedation for diagnostic interventional medical and surgical procedures</i> , Appendix 9 PS-18, <i>Recommendations on monitoring during anaesthesia</i> Appendix 15
Acute Pain Service	E	E	D		According to ANZCA doc PS41 (2000) <i>Guidelines on Acute Pain Management</i>
ATLS/EMST trained	E	E	D		Ascertain – & proportion of staff trained
Other Specialties					
Medical specialties – Cardiology	E	E			Ascertain
Medical specialties – Respiratory	E	E			Ascertain
Medical specialties – Nephrology	E	E			Ascertain
Medical specialties – Neurology	E	E			Ascertain
Medical specialties – Haematology	E	E			Ascertain
Medical specialties – Infectious Diseases	E	E			Ascertain
Paediatrics – Paediatric Trauma Centre	E				Ascertain 24 hr on site registrar & surgeon available within 30mins
Paediatrics – Adult Trauma Centre	E	E	E	E	Ascertain Guidelines for consultation & transfer with specialist paediatric centre
Paediatrics – facility for both	E	E			Ascertain 24 hr on site registrar & surgeon available within 30mins
MTC with obstetrics	E	D	D		Ascertain 2 4 hr on call on site registrar & consultant available within 30mins
MTC without obstetrics	E	E	E	E	Ascertain Guidelines for consultation, transfer
Aged Care	E	E			Ascertain Available within 24 hrs
Rehabilitation	E	D			Ascertain Available within 24 hrs

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Model Criteria	I	II	III	IV	Criteria Specifics
Other Specialties (cont)					
Allied Health - physiotherapy - occupational therapy - social work/counselling - speech pathology - nutritional support	E	E	D		Ascertain Family social work/family support available 24 hr Ascertain Staff critical incident stress management
Psychiatry	E	E	D		Ascertain On call 24 hrs
Transplant coordinator contact	E	E	D		Ascertain procedure & instructions
Guidelines for the management & transfer of burns patients	E	E	E	E	Ascertain procedure & instructions
Guidelines for the management & transfer of spinal cord injury patients	E	E	E	E	Ascertain procedure & instructions
Intensive Care Unit					
Staffed & equipped in accordance with JFICM minimum standards for intensive care units Level 3 (C24 training classification, E = Level 1, D = Level 2 trauma centre)	E	E at apr level	D		JFICM, ANZCA, RACP Doc IC-1 <i>Minimum Standards for Intensive Care Units</i> - Appendix 16 Ascertain ICU level based on prior JFICM accreditation
ICU Registrar part of trauma team response	E	E	D		Ascertain
ICU Registrar accompanies transport from ICU to radiology/OR	E	D	D		Ascertain
Isolation rooms/environmental controlled rooms	E	E	D		Ascertain
ATLS/EMST trained	E	E	D		Ascertain – & proportion of staff trained
Imaging Services					
General criteria as established in JFICM, ANZCA, RACP accreditation guide	E	E	E		ANZCA document T2 (2000) <i>Recommendations on minimum facilities for safe anaesthesia practice outside operating suites</i> - Appendix 14
Geographically adjacent to acute care areas	E	E	D		Ascertain access
Plain X-ray 24hrs stat	E	E	D	D	Ascertain Radiographer on site For rural, ascertain medical officer training & accreditation for taking x-rays 24 hrs day
Angiography (digital) within 30mins	E	E			Ascertain
CT scan within 30mins	E	E	D		Ascertain
PACS system	E	E	D	D	Ascertain
Ultrasound, including Duplex scanning	E	E			Ascertain Available within 1 hour of request

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Model Criteria	I	II	III	IV	Criteria Specifics
Imaging Services (cont)					
Echo	E	E			Ascertain 2D or Transoesophageal available within 1 hour of request
Ultrasound	E	E	D		Ascertain
Angiography (digital)	E	E			Ascertain
Nuclear scanning	E	D			Ascertain
Interventional radiology	E	E			With capacity for large vessel stenting & angiographic embolization
MRI	E	D			With capacity for mechanical ventilation & monitoring
Teleradiology	D	D	D		Ascertain
Radiographer part of Trauma Team	E	E	D		Ascertain
Presence of resuscitation equipment in CT scanner room	E	E	E		Confirm radiology has resuscitation facilities & CPR protocols
24 hour radiology reporting of CT & MRI scans	D	D	D		Ascertain
Radiology Registrar/Consultant reporting of all trauma films within 12 hours	E	E	E		Ascertain
Laboratory Services					
Blood Delivery	E	E	D		O neg immediate access Group specific 20mins X match 40mins Platelets 30mins FFP 30mins Blood bank facility & technician on site 24 hours arrangement for delivery or visiting
Blood typing & cross matching	E	E	D		As above
ABGs – stat 24 hrs	E	E	D	D	Point of care including appropriate equipment in resuscitation area for stat results
Electrolytes – stat 24 hrs	E	E	D	D	Point of care including appropriate equipment in resuscitation area for stat results
Coagulation studies – Within 1 hour	E	E	D		Ascertain Results available 1 hour
Drug & alcohol screening – Stat 24 hours Ethanol	E	E	D		Ascertain Results available 1hr
Osmolality – within 1 hour	E	D			Ascertain Results available 1hr
Microbiology (Gram stain)	E	D			Ascertain Results available 1hr
Carboxyhaemoglobin	E	D	D		Ascertain Results available 30 min
Pregnancy Test	E	E	E	E	Ascertain Results available 1hr

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Model Criteria	I	II	III	IV	Criteria Specifics
Operating Theatres and Recovery Room					
General criteria as established in the ACHS Accreditation guide	E	E	D		Ascertain
Staff immediately available 24 hours	E	E	D		Ascertain
Emergency OR available within 30 minutes?	E	E	D		Ascertain
Neurosurgical capability	E	E			Ascertain
Operating microscope	E	D			Ascertain
On-site X-ray	E	E	D		Ascertain
Image intensification	E	E			Ascertain
Cardiopulmonary bypass	E	E			Ascertain
Anaesthetic capability	E	E	D		ANZCA Docs T1 <i>Recommendations for minimum facilities for anaesthesia practice in operating suites</i> , Appendix 13 Doc PS4 <i>Recommendations for the post-anaesthesia recovery room</i> , Appendix 18
Temperature control	E	E	D		Ascertain
Transoesophageal echo	E	E			Ascertain
Endoscopy	E	E	D		Ascertain
Communications	E	E			Ascertain
Recovery Room capability	E	E	D		According to ANZCA guidelines Doc PS4 <i>Recommendations for the post-anaesthesia recovery room</i> Appendix 18
Education					
Personal education for clinicians involved in trauma care - EMST	E	E	D	D	Ascertain EMST or equivalent for all consultant medical staff & trauma team leaders MOPS for all the above
	E	E	D	D	
Personal education for surgeons involved in trauma care - DSTC	E	D	D		Ascertain DSTC or equivalent for all General, Vascular, Orthopaedic & Neurosurgeons participating in trauma receiving
Personal education for nurses involved in trauma care – eg TNCC	E	E	D	D	Ascertain Trauma training program for all nursing staff participating in trauma receiving
Education by trauma service – offer opportunity for EMST	E	D	D		Ascertain Offer EMST course
Education by trauma service – conduct & oversee regular multidisciplinary education sessions	E	D	D		Ascertain Regular multidisciplinary education sessions occur & type
Education by trauma service – conduct & oversee outreach education sessions to referring or network hospitals	E	D	D		Ascertain Outreach education sessions to referring or network hospitals
Education by trauma service – conduct & oversee orientation program for incoming staff	E	E	E	E	Ascertain Orientation program for incoming staff
Education by trauma service – conduct & oversee in-service training for ward nurses	E	E	D		Ascertain In-service training for ward nurses

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Model Criteria	I	II	III	IV	Criteria Specifics
Quality Improvement					
Continuous quality improvement program with evidence of quality cycle loop closure	E	E	D		Ascertain compliance with ACHS guidelines www.achs.org.au/
Continuum of care guidelines	E	E	D		Ascertain compliance with ACHS guidelines www.achs.org.au/
Reporting of Trauma Outcomes	E	E	E	E	Ascertain Regular report to designating authority of major trauma case load, type, severity, mortality & morbidity (as described in QA program)
Peer review protection	D	D	D	D	Ascertain Documentation supporting legislative protection of the QA process
Benchmarking	E	E	D		Ascertain Regular contribution of standard trauma outcomes data (as required by designating authority) that enables comparison with other services
Safe hours – policy	E	E	E	E	Ascertain. Evidence of adherence to safe hours code, policy, guidelines etc.
Safe hours – practice	E	E	E	E	Is a night registrar available?
Record of attendance by trauma panel at QA sessions	E	E	D		Ascertain & review
Better Practice Guidelines: with the focus on improved outcomes & performance enhancement specific to this institution	E	E	D		Ascertain & review
Orientation & Education Manual	E	E	D	D	Ascertain & review
Policy & Procedure Manual	E	E	D	D	Ascertain & review
Data Registry					
Demonstrate the process for data collection in your hospital, including the identification of trauma patients from the hospital systems in place	E	E	E	D	Demonstrate
Demonstrate QA query to find duplicate records	E	E	E	D	Demonstrate
Demonstrate QA query to find patients with >1 record on the database (trauma recidivism)	E	E	E	D	Demonstrate
Demonstrate the formula & queries for the auto-calculations for: GCS, ISS, TRISS, ASCOT, LOS and any other auto-calculations.	E	E	E	D	Demonstrate

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Model Criteria	I	II	III	IV	Criteria Specifics
Data Registry (cont.)					
Recode and compare results with those from - 2 patients with ISS >15 who died (1 head injury; 1 other trauma) - 2 x patients ISS >15 who were admitted to ICU (1 head injury; 1 other trauma) - 2 x patients ISS >15 who survived to hospital discharge or go to ICU - 2 x patients ISS >41 not admitted to ICU	E	E	E	D	Demonstrate
Research					
Trauma Research	E	D			Ascertain Trauma data source for major or multiply injured patients
Trauma Research	E	D			Ascertain Documented evidence of research
Community Education					
Community education	E	E Rural D Metro	D		Ascertain evidence of contribution/linkages to State/Regional education programs
Disaster Planning					
Up to date disaster manual for in & out of hospital disasters	E	E	D		Ascertain & review
Demonstrable linkages with regional planning processes	E	E	D		Ascertain & review
Regular tests of the components of disaster planning – including multidisciplinary involvement	E	E	D		Ascertain & review
Protocols/guidelines/algorithms & Procedure Documentation					
Cervical Spine clearance	E	E	D		Ascertain & review
Management of the pregnant trauma patient	E	E	D		Ascertain & review
Paediatric trauma management	E	E	D		Ascertain & review
Emergency room resuscitative thoracotomy	E	E	D		Ascertain & review
Management of the dying blunt trauma patient in ED	E	E	D		Ascertain & review
A DVT prophylaxis in trauma	E	E	D		Ascertain & review
Other					Ascertain & review
Wards					
Patients admitted to one area in the hospital	E	D	D		Ascertain
Nursing staff with in-service	E	E	D		Ascertain

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Model Criteria	I	II	III	IV	Criteria Specifics
training specific for major trauma					
Patients admitted under one admitting unit bed card (multi system patients)	E	D			Ascertain
24 hour ward surgical & medical staffing cover	E	E	E		Ascertain

References for Model Resource Criteria:

1. Resources for Optimal Care of the Injured Patient: 1999 [Committee on Trauma American College of Surgeons]
2. Report of the Working Party on Trauma Systems [National Road Trauma Advisory Council 1993]
3. Review of Trauma and Emergency Services – Victoria 1999 – Final Report of the Ministerial Taskforce on Trauma and Emergency Services and the Department Working Party on Emergency and Trauma Services [Human Services Victoria]
4. ANZCA website – www.anzca.edu.au
5. JFICM, ANZCA, RACP website – www.jficm.anzca.edu.au

Trauma Director – Role

The Trauma Director provides the required leadership which is needed for a Trauma Service to function within the individual hospital and wider Area Health Service. The Trauma Director's role includes the development, implementation and evaluation of trauma system protocols which meet the needs of the trauma patient from pre-hospital through to rehabilitation.

The tasks, which accompany this function, include:

Clinical Activities

- Provides clinical expertise in resuscitation and the ongoing treatment of patients with multiple serious injuries
- Coordinates the care of the patient between multiple services and specialties
- Participates in the emergency on call roster for the relevant sub specialty and trauma
- Leads the weekly multi-disciplinary rounds of trauma patients

Administration

- Assumes the administrative function for the Trauma Service including membership of the hospital Clinical Executive Group which looks at long term strategic planning for the hospital and area health service focussing on service delivery and capital improvement
- Coordinates, participates and chairs the hospital Trauma Committee and Area Trauma Committee
- Attends and participates as an active member of the State or Territory's Trauma Committee
- Implements and is responsible for the Trauma Team/Surgical roster
- Assists the Trauma Coordinator and the multi-disciplinary Trauma Committee with the development of policies and procedures and reviews it annually
- Supervises and delegates appropriate duties to the Trauma Fellow

Quality Assurance

- Critically reviews complications and deaths on the Trauma Service as chair of the Trauma Morbidity and Mortality Committee
- Assists the Trauma Coordinator in evaluating the effectiveness of action taken resulting from monitoring the quality and appropriateness of care
- Works with the Trauma Coordinator and Data Manager to analyse tabulated data to determine if trends are evident
- Individually counsels physicians who have been involved in any patient management problem

Education

- Participation in the ongoing education and orientation of hospital and area network personnel involved in the management of the trauma patient
- Conducts weekly educational sessions for members of the multi-disciplinary team

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- Teaches surgical trainees, residents, interns, nurses and allied health staff the principles of evaluation and management of the trauma patient
- Provides educational opportunities for medical students rotating through the Trauma Service
- Lectures to medical students who are rotated to the hospital as a requirement of their designated university medical course
- Teaches and participates at instructor/director levels the EMST course
- Edits and contributes to the hospital trauma manual

Research

- Performs relevant clinical research relating specifically to the evaluation and management of trauma patients
- Provides advice and resources to registrars/residents to conduct basic scientific and clinical research
- Writes and supervises grant applications for financial assistance in the performance of basic scientific and clinical research
- Participates in trauma prevention research in partnership with the area injury prevention unit
- Works with relevant state or territory and national bodies to address the effects of trauma on society

[Written and supplied by the NSW Institute of Trauma & Injury Management]

Trauma Nurse Coordinator –Role

The Trauma Nurse Coordinator, in close collaboration with the Trauma Director and departmental managers, is responsible for monitoring and coordinating all operational issues that are involved in the multidisciplinary team approach to quality care of the trauma patient from pre-hospital to rehabilitation. Areas of responsibility include evaluating patient care, identifying system problems, making recommendations for improvement, and coordinating continuing educational trauma related activities for the hospital. The Trauma Nurse Coordinator functions as a liaison for trauma care by maintaining effective lines of communication to the wider area health service and community including:

- Retrieval Services
- Injury Prevention Unit
- State or Territory Health Department
- Regional District Ambulance
- Universities Clinical/Medical and Nursing Faculties
- State or Territory Major Trauma Services

To function in the Trauma Nurse Coordinator's role, five areas of defined responsibility have been identified: Clinical Activities, Quality Management, Education, Research and Administration.

Clinical Activities:

- Participates in daily patient rounds with the specialty team and or the Trauma Director/Trauma Fellow
- Attends weekly multidisciplinary rounds
- Identifies high risk patients and reports same to the Trauma Director
- Communicates with medical and allied health staff and clarifies trauma system issues
- Provides feedback to staff on a regular basis
- Checks that all appropriate teams are aware of the patient's admission
- Ensures that the appropriate discharge plans are functioning
- Attends Trauma Team calls to review team performance and response

Quality Management:

- Coordinates review of ACHS Clinical Indicators
- Identifies trauma systems related issues and directs information to the Trauma Director and relevant committees ensuring loop closure
- Performs concurrent review of patients' charts, evaluates for potential care issues and refers this to the Trauma Director and appropriate specialty managers.
- Organises data and attends the monthly death audit
- Participates in data collection and supervises trauma registry entry ensuring registry confidentiality
- Works with the Trauma Director/Data Manager to analyse tabulated data to determine if trends are occurring

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- Institutes audits of specific problem areas

Education

- Coordinates and collaborates on educational activities necessary to meet the objectives of the Trauma Centre
- Coordinates weekly multidisciplinary Trauma Clinical meeting
- Conducts regular Trauma Review meetings with Emergency Nursing Staff
- Participates in orientation, in-service and mentor programs for nursing, medical and allied health staff at hospital and area level
- Attends and lectures as invited speaker at Trauma related conferences
- Reviews and updates hospital trauma guidelines manual in collaboration with the Trauma Director

Research

- Participates in collaborative research as a member of a multidisciplinary team or principal investigator of a designated study
- Identifies specific trauma research areas of interest
- Utilises the trauma registry database as a source of information to medical, nursing and allied health staff for research projects
- Participates in injury prevention research activities
- Authors and co-authors research papers for publication

Administration

- Attends monthly hospital trauma committee meetings
- Attends bi-monthly Area Health trauma committee meetings
- Participates in hospital disaster committee
- Management and mentoring of staff within the Trauma Service
- Implementation of policies and monitoring productivity

[Written and supplied by the NSW Institute of Trauma & Injury Management]

Hospital Trauma Committee Criteria

Suggested terms of reference:

- Multidisciplinary
- Must hold regular meetings
- Minutes recorded including action plans and closing loop
- Receive regular reports from Trauma Director and Trauma Coordinator
- Independent of but with representation of hospital management
- Clear communication channels to hospital management and/or State or Territorial Health Departments
- Provide feedback

Area/Regional Trauma Committee Criteria

Suggested terms of reference:

- Multidisciplinary including pre hospital (retrieval and ambulance)
- Must hold regular meetings
- Minutes recorded including action plans and closing loop
- Receive regular reports from Trauma Directors and Trauma Coordinators from all area/regional hospitals involved in trauma care
- Independent of but with representation of Area/Regional medical management
- Clear communication channels to each hospital management and/or State or Territorial Health Departments
- Agenda items include reporting of and attending to area/regional trauma education, audit of deaths at each hospital, trauma interhospital transfers, trauma bypass, feedback and data collection and reporting.

Evidence for Verification

Appendix A

American College of Surgeons, Committee on Trauma Verification Review: does it really make a difference?

Authors

Ehrlich PF., Rockwell S., Kincaid S., and Mucha P Jr.

Institution

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Source

Journal of Trauma-Injury Infection & Critical Care. 53(5):811-6, 2002 Nov.

Abstract

BACKGROUND

Although not directly involved in designation per se, the American College of Surgeons (ACS) Committee on Trauma verification/consultation program in conjunction with has set the national standards for trauma care. This study analyzes the impact of a recent verification process on an academic health center.

METHODS

Performance improvement data were generated monthly from the hospital trauma registry. Forty-seven clinical indicators were reviewed. Three study periods were defined for comparative purposes: PRE (January, June, October 1997), before verification/consultation; CON (April 1999-October 1999), after reorganization; and VER (November 1999-September 2000), from consultation to verification.

RESULTS

Statistically significant ($p < 0.05$) quantitative and qualitative changes were observed in numbers (percent) of patients reaching clinical criteria. These included prehospital, emergency department, and hospital-based trauma competencies. Trauma patient evaluation (including radiology) and disposition out of the emergency department (< 120 minutes) improved in each study section (PRE, 21%; CON, 48%; VER, 76%). Enhanced nursing documentation correlated with improved clinical care such as early acquisition of head computed axial tomographic scans in neurologic injured patients (PRE, 66%; CON, 97%; VER, 95%). Intensive care unit length of stay (< 7 days) decreased (PRE, 87%; VER, 97.8%). Other transformations included increase in institutional morale with recognition of trauma excellence within the hospital and resurgence of the trauma research programs (60 institutional review board-approved projects).

CONCLUSION

The ACS verification/consultation program had a positive influence on this developing academic trauma program. Preparation for ACS

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verification/consultation resulted in significant improvements in patient care, enhancement of institutional pride, and commitment to care of the injured patient.

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Appendix B

Orthopaedic Trauma Association 16th Annual Meeting San Antonio, Texas October 12, 13, 14, 2000

Session VII A - Paper #26 1:50 p.m.

IMPACT OF PREPARATION AND ACHIEVEMENT OF ACS LEVEL 1 TRAUMA VERIFICATION RAISES HOSPITAL PERFORMANCE AND IMPROVES PATIENT OUTCOME

Cheryl Holly RN, PhD; Stephen M. DiRusso, MD, PhD; Sara Neelson Cuff, RN; Helga Scharf RN; Thomas Sullivan BS; Peter Nealon BA; Jason Boardman, MD; John A. Savino MD Surgery Department, New York Medical College, Valhalla, NY 10595

Invited Discussant: Brent A. Eastman, MD

Objective:

To assess the impact on patient outcome and hospital performance of preparing for and achieving ACS Level 1 Trauma Verification.

Hospital Setting:

A previously designated state Regional Trauma Center located adjacent to a major metropolitan area. Preparation for ACS verification began in early 1996 and was completed in early 1998. Final verification took place in April 1999. Data were analyzed before (1994) and after (1998) process.

Hospital System Improvements:

Marked increase in administrative support with trauma organized as one of the hospital's six centers of excellence. Two full-time board certified trauma/critical care surgeons were added to the current six trauma surgeons. Their major focus was trauma care. Trauma support staff was also increased with case managers, a trauma nurse practitioner, additional trauma registrars, and administrative support staff. Education and CQI were markedly expanded starting in 1996.

Results:

There were 1098 trauma patients admitted in 1994, 1658 in 1998. Overall mortality decreased (1994: 7.38%, 1998 5.37%, $p < 0.05$). There was a marked decrease in mortality for severely injured (ISS > 30) patients (1994: 44% mortality [38/86], 1998: 27% [22/80], $p < 0.04$). Average LOS also decreased (1994: 12.22 days, 1998 9.87 days, $p < 0.02$). This yielded an estimated cost savings for 1998 of greater than \$7,000/patient (total saving estimate of 11.6 million dollars).

Conclusions:

Trauma system improvement as related to achieving ACS Level 1 verification appeared to have a positive impact on survival and patient care. There were cost savings realized which helped alleviate the added expense of this system improvement. The process of achieving ACS Level 1 Verification is worthwhile and can be cost effective.

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Appendix C

Analysis of American College of Surgeons trauma consultation program.

Authors

Mitchell FL, Thal ER, Wolferth CC.

Institution

Department of Surgery, University of Missouri, Columbia, USA.

Source

Arch Surg. 1995 Jun;130(6):578-83; discussion 583-4.

Objective:

To identify the criteria deficiencies found during peer consultation of hospitals and the relationship to subsequent verification.

Methods:

Between September 1987 and December 1992, 52 hospitals had consultation visits using American College of Surgeons criteria. Each report was studied for deficiencies, frequency of deficiencies, and relationship to verification.

Results:

There are 108 American College of Surgeons criteria. Thirty-five different criteria deficiencies were found. The number of deficiencies per hospital ranged from zero to 12.

The more frequent deficiencies included a lack of the following: quality improvement, 35 (67%); trauma service, 20 (38%); trauma surgeon in emergency department, 20 (38%); 24-hour operating room availability, 17 (33%); trauma registry, 17 (33%); trauma continuing medical education, 16 (31%); trauma director, 15 (29%); computed tomography technician in hospital, 15 (29%); research, 14 (27%); trauma coordinator, 14 (27%); and neurosurgeon availability, 13 (25%). No hospital that lacked commitment of surgeons ($n = 12$) or hospital ($n = 3$) requested a verification visit. Twenty-four hospitals (46%) achieved verification by February 1994. Twenty-eight hospitals had six or fewer deficiencies, with 19 (68%) verified. Twenty-four hospitals had seven or more deficiencies, with only five (21%) subsequently verified. Verification visits followed consultation by 3 to 52 months. Two hospitals with nine deficiencies were verified after 30 and 48 months, although one failed its first verification visit.

Conclusions:

American College of Surgeons consultation assists hospitals to identify their trauma center capability and appears to improve their ability to pass subsequent trauma center verification. Most criteria deficiencies are correctable. Lack of commitment by the surgeons or hospital is difficult to correct. There is an inverse relationship between the number of deficiencies and subsequent verification.