

**A Trauma
Education Framework
For Victoria**

October 2001

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List Of Acronyms

| Acronym | Full Title |
|---------|--|
| ACCCN | Australian College of Critical Care Nurses |
| APLS | Advanced Paediatric Life Support |
| BMCG | Balanced Management Consultancy Group |
| CCRTF | Consultative Council on Road Traffic Fatalities Committee |
| DHS | Department of Human Services |
| DSTC | Definitive Surgical Trauma Course |
| ELS | Emergency Life Support |
| EMST | Early Management of Severe Trauma |
| ENA Vic | Emergency Nurses Association Victoria |
| FLECC | First Line Emergency Care Course |
| GPs | General Practitioners |
| HDU | High Dependency Unit |
| ICU | Intensive Care Unit |
| MAS | Metropolitan Ambulance Service |
| MeTS | Metropolitan Trauma Service |
| MICA | Mobile Intensive Care Ambulance |
| MTMS | Major Trauma Management Study |
| MTS | Major Trauma Services |
| RAV | Rural Ambulance Victoria |
| RCCECCS | Regional Consultative Committees on Emergency and Critical Care Services |
| ROTES | Review of Trauma and Emergency Services |
| RTS | Regional Trauma Services |
| STC | State Trauma Committee |
| TNCC | Trauma Nursing Core Course |
| UCS | Urgent Care Services |
| VSTS | Victorian State Trauma System |
| VTF | Victorian Trauma Foundation |

1. Executive Summary

The Victorian Trauma Education Framework has been developed by the State Trauma Committee (STC) and will be reviewed and further developed as trauma management education evolves in Victoria.

The STC established an Education Subcommittee to advise on a process for the implementation of *ROTES* recommendations related to trauma education and training and to provide advice on the coordination of trauma education and training activities. In the *Review of Emergency and Trauma Services – Victoria 1999 Report (ROTES)*⁽¹⁾, the Ministerial Taskforce noted that “efficient and effective trauma management will be dependant upon the provision of education and training programs that meet the needs of staff from diverse disciplines”.

One of the key elements to the establishment of the Victorian state trauma system (VSTS) has been the published results from the Consultative Council on Road Traffic Fatalities Committee (CCRTF)⁽²⁾ and Major Trauma Management Study (MTMS)⁽³⁾ research, both of which identified critical deficiencies in the management of major trauma patients. The conclusion from examining these management areas is that there is a need for:

- ◆ The development of experienced senior leaders in the management of trauma patients from the time of reception in hospital, right through the care continuum;
- ◆ Clearly identified system processes for pre-hospital management, interhospital transfer and in-hospital management (the development of guidelines, algorithms and protocols); and
- ◆ Upskilling of pre- and in-hospital providers.

The Victorian Trauma Foundation (VTF)⁽⁴⁾ commissioned a report which identified five key elements required for the establishment of a sound ongoing framework for trauma education:

- ◆ A co-ordinated approach – a co-ordinated statewide strategy supported by appropriate resources;
- ◆ Consistency in education – a common set of principles, with the provision of standards and levels of education for each professional group;
- ◆ Programs for learning trauma-related skills;
- ◆ Development of evaluation techniques to assess skill transfer from trauma education to on-the-job practice; and
- ◆ The provision of accessible education on a statewide basis – flexible learning options and work time allocation to education.

The current review of trauma education programs in Victoria identified that there are a number of areas where training is not currently available. These are highlighted in Figure 1, and are, in summary:

- ◆ No undergraduate nursing or multidisciplinary trauma courses currently exist;
- ◆ There is a lack of dedicated trauma training at postgraduate level for all disciplines except medical (that is, nursing, ambulance and multidisciplinary);
- ◆ Similarly, a number of postgraduate speciality training programs lack a trauma component; and
- ◆ Specified advanced trauma training, whilst available for surgeons and Air MICA ambulance officers, is not available for other groups.

Whilst it is difficult to prioritise definitively educational programs, the STC identifies four major factors which should inform any prioritisation. These are:

- ◆ Identified clinical management deficiencies;
- ◆ Currently identified deficiencies in educational programs;
- ◆ The evolution of the VSTS; and
- ◆ The identification of specific barriers which need to be addressed before educational programs can be effectively implemented.

This Framework expands upon and itemises these issues. Guidelines are given at Appendix 7 to assist in the identification of useful education programs, needed immediately and into the future. Three principle areas of educational focus need to be addressed by educational programs:

- ◆ System issues;
- ◆ Clinical development; and
- ◆ The establishment of guidelines and protocols.

Trauma education in relation to these areas should be targeted at the following groups:

- ◆ Medical;
- ◆ Nursing;
- ◆ Paramedical;
- ◆ Hospital executives and management; and
- ◆ Allied health.

The principle barriers to the delivery of education programs include geographical distance, high work loads and limited back fill, limited availability of educational courses, a deficiency in flexible delivery methods in the courses currently available, the high costs of trauma education, and a lack of multidisciplinary focus.

The STC has identified Major Trauma Services (MTSs) as being a statewide resource which should play significant lead roles in contributing to the development of educational programs relevant to the VSTS. This can only be effective, however, if such programs are constructed in concert with the relevant stakeholders – that is, from rural, regional and metropolitan trauma providers, and from the relevant professional groups being targeted by the educational programs. The development of a cohesive education program for Victoria will necessitate close collaboration between all stakeholders.

The issue of funding for trauma education is one that will require further consideration by the Department of Human Services and the STC.

The STC has identified minimum training levels that each professional group should achieve, relevant to the level of trauma service in which they work. The identified group of individuals working in the management of major trauma within each hospital is termed the Trauma Panel, and a clearer understanding should be had, for quality purposes, of the minimum educational requirements to be achieved by all members of the Panel.

As Victoria stands at the threshold of the most carefully planned and systematised trauma management process in Australasia, the successful implementation of a framework for education will be vital to the success of the entire program.

1.1 Trauma Education Framework Recommendations

The State Trauma Committee recommends to the Department of Human Services:

Recommendation 1 - That active education programs be instituted with respect to the structure and function of the VSTS.

Recommendation 2 - That in the development of specific education programs, two principle factors are considered:

- ◆ The potential benefit of the program to the VSTS; and
- ◆ The potential benefit of the program to the targeted participants.

Recommendation 3 - That the following 5 key elements be recognised as important to this establishment of a sound framework for trauma education:

- ◆ A co-ordinated approach – a co-ordinated statewide strategy, supported by appropriate resources;
- ◆ Consistency in Education – a common set of principles, with the provision of standards and levels of education for each professional group;
- ◆ Programs for learning trauma related skills;
- ◆ Development of evaluation techniques to assess skill transfer from trauma education to “on the job” practice; and
- ◆ The provision of accessible education on a statewide basis – flexible learning options, and work-time allocation to education.

Recommendation 4 - That the 3 principle areas of educational focus are:

- ◆ System issues;
- ◆ Clinical development; and
- ◆ Guidelines and protocols (Tables 1 and 2).

Recommendation 5 - That four major issues be considered when prioritising the development of education programs:

- ◆ Prioritisation by management deficiencies – the deficiencies identified in clinical management processes by the CCRTF and MTMS research (Table 2);
- ◆ Prioritisation by VSTS timeframe – the proposed timelines for development of the VSTS (Table 1);
- ◆ Prioritisation by identified educational deficiencies (Fig.1); and
- ◆ Prioritisation in relation to educational barriers (Appendix 5).

Recommendation 6 - That the following six principle barriers to education be addressed in the delivery of education programs (Section 6):

- ◆ Distance;
- ◆ High workloads and lack of back fill;
- ◆ Limited educational activities (i.e. lack of relevant courses);
- ◆ A lack of flexible delivery methods of current trauma education;
- ◆ High costs of trauma education; and
- ◆ Single-discipline focus of current education programs.

Recommendation 7 - That education requirements be addressed at undergraduate, postgraduate core levels, and postgraduate advanced levels for all professional groups involved in the management of major trauma (Fig 3).

Recommendation 8 - That quality assessment mechanisms be put in place to ensure ongoing identification of deficiencies and requirements and that this information be used to redefine and redevelop the trauma education program for the state. These quality mechanisms are to include trauma case management review processes (through the monitoring system), quality assessment by site visits to hospitals of all levels within the state trauma system (a verification process) and the measurement of learning outcomes.

Recommendation 9 - That the STC confirms an agreed and structured process for the evaluation of proposed trauma education programs.

Recommendation 10 - That the DHS and the STC consider funding options for trauma education.

Recommendation 11 - That key performance indicators be used to assess the effect of education programs on the delivery of trauma care, where possible.

Recommendation 12 - That education programs be designed to allow for the assessment of the learning obtained by participants.

Recommendation 13 - That, at all levels, hospitals providing care for major trauma patients identify a Trauma Panel of health care providers who are expected to have undertaken minimum educational programs (Table 3).

Recommendation 14 - The members of Trauma Panels in hospitals undertake the minimum expected training programs recommended for their hospital by the STC, and also participate regularly in ongoing levels of Continuing Medical Education with respect to trauma.

Recommendation 15 - The Education Framework of the STC should be used as a guideline by the VTF in assessment of submissions for funding, in the field of trauma.

Recommendation 16 - That evaluation panels examining trauma education funding submissions should have expert representation from all relevant disciplines.

Recommendation 17 - That Regional Consultative Committees on Emergency and Critical Care Services (RCCECCs) act to assist the Education Subcommittee with respect to local courses held within any one particular region.

Recommendation 18 - That resuscitation education programs be consistently based around EMST/ATLS principles.

Recommendation 19 - That professional bodies be sourced with respect to curricula and syllabus outlines and with respect to basic content for courses at undergraduate, postgraduate and advanced levels for relevant professional groups.

Recommendation 20 - That specific courses targeted at individual professional groups also be developed, where appropriate.

Recommendation 21 - That all relevant subgroups of any professional group be consulted with respect to the development of a course for that professional group.

Recommendation 22 - That educational programs be geographically accessible to trauma care providers.

Recommendation 23 - That multidisciplinary courses be developed and regularly delivered, in order to foster interactive processes between professional groups, as well as for efficiency and economy of delivery.

Recommendation 24 - That various methods of delivery of education for the VSTS be utilised, including the following:

- ◆ Case studies;
- ◆ Computer managed learning – including. Internet, interactive CD ROMs and videos;
- ◆ Critical incident analysis;
- ◆ Skills demonstration and participation programs;
- ◆ Group/panel discussions;
- ◆ Lectures/seminars;
- ◆ Simulation;
- ◆ Teleconferencing;
- ◆ Staff rotation through major trauma services – “on the job” education; and
- ◆ Written material.

Recommendation 25 - That educational mechanisms be developed to ensure the further development of interventional competence in trauma management.

Recommendation 26 - That the MTSs be regarded as a key resource for the development of educational programs, but that all relevant stake holders be involved in programs specific to their profession and/or geographic region.

Recommendation 27 - That attention should also be paid to education for allied health groups, the community, and the management of minor trauma.

Recommendation 28 - That the Framework document is made readily available to interested individuals, groups and professional bodies.

Recommendation 29 - That the Trauma Education Framework for Victoria be regularly revised as the VSTS develops.

2. Background

Research into the outcomes of patients who experienced traumatic injury in Victoria through the decade of the 1990s, revealed that between 32.3%⁽³⁾ of death from all types of trauma, and 35%⁽²⁾ of all deaths following road trauma were considered by expert panels of clinicians to have been preventable or potentially preventable (P/PP). The studies of survivors of major trauma, who had significant and serious adverse outcomes, showed that 47.6% of these had P/PP outcomes⁽³⁾.

In 1997, the then Minister for Health established a Ministerial Taskforce on Trauma and Emergency Services to review trauma services in Victoria. The *ROTES* report released in 1999 recommended a proposed framework for the development of a VSTS. The current Minister for Health, the Honourable John Thwaites, M.P endorsed the findings of the *ROTES* report and the VSTS is currently being developed and implemented.

In the *ROTES* report, education and training was identified as a major part of the infrastructure of the VSTS. The Taskforce recommended, “efficient and effective trauma management will be dependent upon the provision of education and training programs that meet the needs of staff from diverse disciplines”. In addition, “the Taskforce recommends strategies to establish a framework for meeting requirements of trauma care practitioners. The STC, the Trauma System Coordination Unit, and Directors of Trauma Services, will be responsible for implementing this framework”. In all, there were 17 specific recommendations in the *ROTES* report with respect to education and training. These are reproduced in Appendix 3.

2.1 Identified Areas Of Management Deficiency From CCRTF And MTMS Research

The CCRTF and MTMS studies identified critical deficiencies in the management processes, contributing to the deaths or adverse outcomes of patients suffering major trauma, and pinpointed the exact time and processes of management at which deficiencies occurred.

Appendix 4 (refer pg. 25 of the *ROTES* report) tabulates the management or system errors identified in the CCRTF studies.

The MTMS study identified a total of 290 management deficiencies and 101 P/PP outcome patients. Appendix 1 depicts the type and site of these 290 management problems.

Both reports identified that the greatest single number of management errors occurred in the Emergency Department. This is not surprising given the complexity of urgent management tasks undertaken at that point in time.

The most common management deficiencies found by the MTMS study (in patients either dying, or surviving with serious adverse outcomes), were:

- ◆ Inappropriate endotracheal intubation (66);
- ◆ Surgical delays or deficiencies (42);

- ◆ Deficiencies in Intra-Cranial Pressure monitoring (26);
- ◆ Deficiencies in fluid resuscitation (25);
- ◆ Delays in obtaining CT scans (19); and
- ◆ Excessively prolonged times spent at the scene of the accident (15).

Both studies identified deficiencies in the diagnosis and treatment, as well as deficiencies in the implementation of systems or protocols of management.

Clearly higher skill levels for all personnel involved with in-hospital resuscitation and ongoing management would also have contributed significantly to a decrease in these management and system errors. In particular, the relatively high incidence of surgical delays, indicate a need for attention to the training of surgical staff, and having senior surgical staff present as part of the resuscitation team.

The high level of problems in the wards and HDU and Intensive Care areas again draws attention to the need for experience and senior supervision of trauma patients through this process.

The third most common area where problems occur is in the pre-hospital area, where there were clearly identified needs for high levels of skill availability, commonly in rural areas, but also for training and education of all officers with respect to the need to avoid delays in getting patients to hospital, and in the appropriate delivery of appropriate pre-hospital resuscitation techniques to patients.

With interhospital transfer issues, the inadequate time response of the system was identified, together with issues arising from lack of senior and experienced supervision during transport.

The conclusion from examining the management areas identified, is that there is a need for:

- ◆ The development of experienced senior leaders in the management of trauma patients from the time of reception in hospital right through the care continuum;
- ◆ Clearly identified system processes for pre-hospital management, inter-hospital transfer and in-hospital management co-development of guidelines, algorithms and protocols; and
- ◆ Upskilling of pre-hospital and in-hospital providers.

2.2 The Education Sub-Committee Of The State Trauma Committee

In August 2000, the STC convened and shortly thereafter established an Education Subcommittee with the following Terms of Reference:

- ◆ To advise the STC and the DHS on a process for the implementation of *ROTES* recommendations related to trauma education and training;
- ◆ To identify issues related to the implementation of trauma education and training and to provide advice on best practice principles;
- ◆ To provide leadership to relevant services regarding trauma education and training; and
- ◆ To provide advice on co-ordination of trauma education and training activities.

2.3 The VTF Trauma Consultancy Report

A report commissioned by the VTF, makes recommendations on the coordination of trauma education (Appendix 5).

The Education Subcommittee acknowledges that the Balanced Management report and its recommendations have been of benefit in the development of an educational framework for the VSTS. However, it should be noted that the recommendations of the BMCG report do not necessarily represent the views of the STC.

The Consultancy Group identified five key elements to the establishment of a sound ongoing framework for trauma education:

- ◆ A co-ordinated approach – a co-ordinated statewide strategy supported by appropriate resources;
- ◆ Consistency in education – a common set of principles with the provision of standards and levels of education for each professional group;
- ◆ Programs for learning trauma related skills;
- ◆ Development of evaluation techniques to assess skill transfer from trauma education to on the job practice; and
- ◆ The provision of accessible education on a statewide basis – flexible learning options, and work-time allocation to education.

2.4 Development of the Trauma Education Framework

The Education Subcommittee of the STC identified the need for a document which set out the current status of the trauma education field in Victoria and identified directions for the future. The Subcommittee developed a draft framework which was distributed to the trauma and healthcare fields for comment. Following endorsement by the STC, the Framework will be provided to the DHS for their information and future planning.

3. Overview Of Current Trauma Education In Victoria

Figure 1 outlines current specific trauma education available in Victoria. This has been divided into undergraduate, postgraduate and advanced training programs.

Undergraduate curriculum in trauma medical education occurs in both medical and paramedic programs, however there is no specific core curriculum for nursing in undergraduate programs.

Postgraduate trauma training has been divided into:

1. Basic core training programs focussing on initial resuscitation and stabilisation. These programs are targeted at personnel involved in the initial management of the trauma patient – principally prehospital and in the emergency department.
2. Postgraduate training programs that have trauma components. These are university or college based programs.
3. Specific advanced training courses targeted at specialty areas.
4. Other recognised short courses that have a trauma component.

Although there is a recognised standardised core trauma course in resuscitation stabilisation and for medical personnel (EMST), the nursing and paramedic fields are not as clearly defined. The content of this core training should follow the principles of EMST.

The Trauma Nursing Core Course (TNCC) was the recognised trauma core course in Victoria for many years. Following review of this course, the Emergency Nurses Association Victoria (ENA Victoria) has stated that the TNCC does not meet the needs of Victorian emergency nurses. Therefore they are no longer facilitating this course. It must be noted that the TNCC is still facilitated through ENA NSW.

There is no post-qualification core trauma training course available for ambulance Paramedics in Victoria.

Pre Hospital Trauma Life Support (PHTLS) is a specific multi-disciplinary trauma course currently available in Queensland.

Other options for developing training are currently being explored. There are other trauma education sessions being conducted by professional bodies and private consultants.

Postgraduate training programs that have a trauma component have been included in the overview. It is important to note that this is not standardised and therefore content is inconsistent.

There are currently no dedicated postgraduate trauma training programs being conducted in Victoria. The medical trauma fellowship is in the initial stages of development only, the MICA program has a large trauma component and there is no nursing program currently available in the state. Specific advanced training is limited.

The only medical program is the DSTC. This is surgeon specific and is currently still being refined. There have been two pilot courses conducted in Victoria to date.

There are no advanced courses in trauma available for nurses in Victoria. The only available advanced training for paramedics is the air MICA program, which has a trauma component.

There are other recognised short courses available that have a trauma component. These are outlined in Figure 1.

Multidisciplinary training is very limited throughout Victoria and occurs on an *ad hoc* basis. Individual institutions that are conducting multidisciplinary training, but this is not standardised or consistent.

Figure 1

Overview Of Current Trauma Clinical Education In Victoria

| | Medical | Nursing | Ambulance | Multi Disciplinary |
|---|--|--|--|---------------------------------------|
| Under Graduate | | | | |
| Universities Teaching Principles Of EMST | YES In Development 2001 | Not Currently | YES | Not Currently |
| Post Graduate | | | | |
| Standardised Core Trauma Course – Initial Resuscitation And Stabilisation | EMST | None Promoted In Victoria | None Available In Victoria | None Available |
| Post Graduate Programs Including Trauma Component | <u>Training Programs</u> Emergency Surgery Anaesthetics ICU Paediatrics Trauma Fellowship (being developed) | <u>Specialty Programs</u> Emergency Theatre ICU Critical Care Neurosurgery Orthopaedics Paediatrics No Dedicated Trauma Program | MICA | None Available |
| Specified Advanced Training | Surgeons – DSTC (Pilot Course) No Other Specific Courses | None Available In Victoria | Air MICA None Other Available | None Available |
| Other Short Courses With Trauma Component | ELS (GP's) APLS CCrISP (Surg) | FLECC (Ednurses) APLS (not assess) ENA 1 day workshop | Approximately 1 Day Trauma Refresher Per year | Crisis Management Simulator Centre |

Legend
Black – Current Education
Red – Identified Areas Of Need

There are other trauma education sessions run by Professional Bodies and Private Consultants.

4. Prioritisation Of Educational Program Development

It is recommended that four major issues be considered when prioritising the development of educational programs. These four are:

Issue 1 - Prioritisation By Management Deficiencies

The deficiencies identified in clinical management processes by the CCRTF and MTMS research.

Issue 2 - Prioritisation By Identified Educational Deficiencies

The absolute deficiencies in educational programs currently in existence.

Issue 3 - Prioritisation By VSTS Evolution

Prioritisation of programs according to the stage of development of the VSTS.

Issue 4 - Prioritisation In Relation To Educational Barriers

Whether the program addresses the following barriers to education:

1. Distance;
2. High workloads and difficulties of back fill;
3. Limited educational activities, i.e. lack of relevant courses;
4. A lack of flexible delivery methods of current trauma education;
5. High costs of trauma education; and
6. Single discipline focus of current education.

In promoting educational program development, the barriers to education development need to be borne in mind and addressed specifically and consciously.

The deficiencies in management have already been identified and tabulated in this report.

These deficiencies are now grouped and tabulated in Table 2; together with the type of educational program development required (system, guidelines or clinical) and the professional groups to which these need to be targeted in order to correct the specific deficiency.

With respect to the absolute deficiencies of current educational programs, these are tabulated in Figure 1 in relation to the professional groups involved and the level of undergraduate or postgraduate education.

With regard to the evolution of the VSTS, Table 1 references the areas of education (system, guidelines or clinical) and the professional group needing to be targeted for specific key infrastructure development.

5. State Trauma Committee Education Framework

5.1 Education At All Levels

Education must focus on:

- ◆ System issues;
- ◆ Clinical management issues;
- ◆ The delivery of education with respect to guidelines, algorithms and protocols;
- ◆ Trauma team training;
- ◆ Trauma team leader training; and
- ◆ Community education, with respect to prevention, system issues and management.

Consideration will also need to be given to evaluation criteria, ongoing need assessment, skills maintenance, technological and therapeutic advances and feedback mechanisms.

The three principle areas of an educational focus (see Table 1) are:

- ◆ System issues;
- ◆ Clinical development; and
- ◆ Guidelines and protocols.

Education target groups include medical, nursing and paramedical, hospital executives and management allied health and the wider Victorian community.

5.2 System Issues

The target areas for education with respect to system issues (Fig 2) are:

- ◆ The triage of major trauma patients: how to and when to get the right patient to the right hospital;
- ◆ Inter hospital transfer processes;
- ◆ Communication – ambulance to hospital; hospital to hospital;
- ◆ System evaluation – a system evaluation process, generating feedback to the clinical workforce through two processes: Multidisciplinary Trauma Case Review Committee evaluations, and a trauma verification process to assess resources and the delivery of care on site at hospitals of all levels;
- ◆ The identification process of the defined major trauma patient;
- ◆ The establishment of the data collection process (training data collectors); and
- ◆ Hospital management – education of administrators with respect to the state trauma system and clinical issues of relevance within their hospital.

Table 1

Education In Relation to the Evolution of the VSTS

| ★ Evolution of VSTS | Education Area: | Professional Group |
|--|----------------------------|------------------------|
| | System | Nursing (N) |
| | Guidelines | Medical (M) |
| | Clinical | Paramedic (P) |
| Education With Respect to VSTS Structure | System | M / N / P Community |
| Development of Major Trauma Services | Guidelines Clinical | M / N |
| Triage of Major Trauma Patients to MTS | System | M / N / P |
| Data Collection | Clinical | N / P |
| Evaluation of the VSTS | System | M / N / P |
| Outcome Evaluation – Feedback | System/Guidelines/Clinical | M / N / P |
| Resource and Provision – Feedback | System/Guidelines/Clinical | M / N / P |
| Development of Retrieval Services | System/Guidelines/Clinical | M / N / P |
| Development of Regional and Metropolitan Trauma Services | System/Guidelines/Clinical | M / N / P |
| Community Education: Injury Prevention and First Aid | System/Clinical | M / N / P Community |

★ Note: It is artificial, in many aspects, to separate some items from others - the development of Regional and Metropolitan Trauma Services should occur alongside the development of MTSs. Increased triage of patients to MTSs however, means that significant efforts need to be put in to ensuring that MTSs are able to appropriately manage the greater numbers of major trauma patients.

Figure 2

Victorian State Trauma System Education Overview And Needs

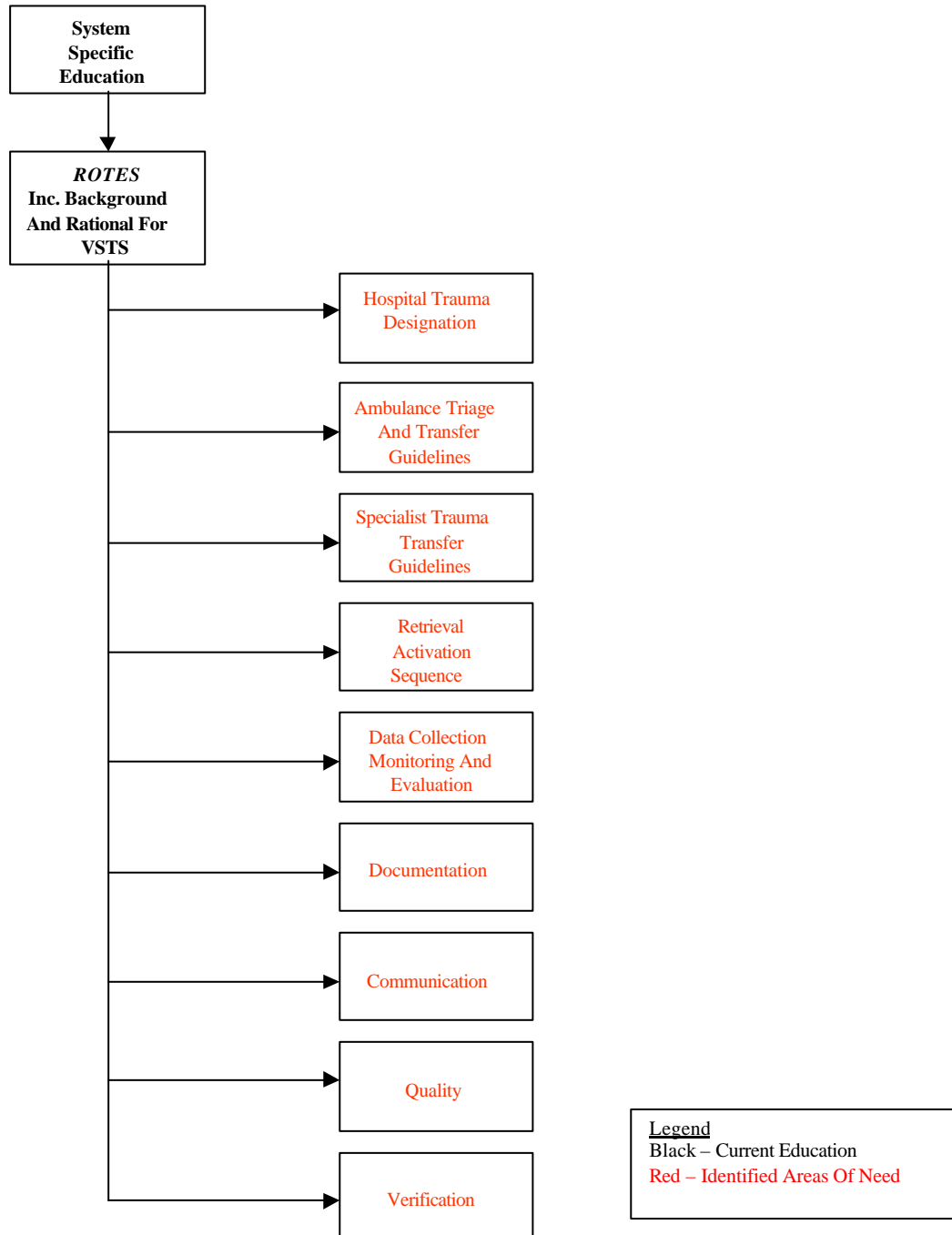


Table 2

**Education In Relation to CCRTF /
MTMS Deficiencies**

| CCRTF / MTMS Management Deficiencies (Prioritised For VSTS Development) | Type of Education Area: System Guidelines Clinical | Professional Group Nursing Medical Paramedic |
|---|---|---|
| ED Resuscitation – Experienced Leadership | Clinical | Medical Nursing |
| ED Resuscitation – Surgical Decision Making | Clinical Guidelines | Medical |
| ED Resuscitation – Airway And Fluid Resuscitation Skills | Clinical | Medical Nursing |
| ED Resuscitation – Diagnostic Issues | System Clinical Guidelines | Medical Nursing |
| Delays in Despatch To OR Other Hospital | System Guidelines | Medical Nursing |
| ICU / Ward / HDU – Ongoing Management Issues Inadequate Fluid Resuscitation Inadequate Respiratory Support And Treatment Delays in Obtaining Surgery Inadequate Brain Injury Diagnosis / Management | Clinical Guidelines | Medical Nursing |
| Pre-Hospital Lack of Appropriate Skill Levels (ATLS Officers) | Clinical | Paramedic |
| Pre-Hospital – Prolonged Scene Times | Guidelines | Paramedic Medical |
| Inter-Hospital Transfer – Inappropriate Form Of, Or Time Of Response Lack Of Medical Escorts | System Guidelines | Medical Paramedic Nursing |

5.3 Target Areas For Education With Respect To Clinical Management

One of the major issues identified by the CCRTF and MTMS studies was the lack of identified experience and expertise, leading to incorrect decision-making in the early phases of management of major trauma patients.

- ◆ Pre-hospital – Paramedic and primary retrieval teams (doctors and nurses);
- ◆ Emergency Department – the right team:
 - Nursing and medical; and
 - Team leader (medical);
- ◆ Consideration of inter hospital retrieval teams;
- ◆ Surgical Services;
- ◆ Anaesthetic Services;
- ◆ Radiology (diagnostic imaging);
- ◆ Operating Room (nursing);
- ◆ Intensive Care – (nursing and medical);
- ◆ Ward care (nursing & medical);
- ◆ Rehabilitation – (nursing, medical);
- ◆ Allied Health: Physiotherapy, Occupational Therapy, Speech Therapy, Psychology, Social Work, Chaplaincy; and
- ◆ The wider Victorian community.

The lack of volume exposure (see Appendix 6) of key medical consultants and nursing personnel to major trauma has been identified as a priority issue in trauma education.

5.4 Improving Interventionist Competencies In Practitioners

The relatively low volume of exposure of any one interventionist to major trauma dictates a need for skills maintenance through education programs. Life saving skills in trauma go beyond the basic resuscitative skills taught in EMST and similar courses. Whilst courses such as DSTC are appropriate for upskilling surgeons, intense periods of exposure to the methods of management at high volume MTSs are required for surgeons, anaesthetists and emergency physicians.

Further courses need to be devised to answer such needs, but essentially periods of secondment to high volume institutions are required. As MTSs develop, identified relevant individuals in these services would benefit significantly from exposure to MTSs overseas. The MTSs themselves, when high volume throughput is established, will be ideal places of secondment for identified individuals from Metropolitan and Regional Trauma Services to gain exposure to interventionist techniques.

5.5 Improving Decision Making and Team Leadership Skills of Senior Trauma Clinicians

The performance of a trauma team depends upon its ability to implement therapeutic strategies based on timely patient assessment and intervention. Within the team, senior trauma clinicians are relied upon for their leadership and decision-making skills and ample consideration must be given to the professional development of this key group.

There is more than one way of organising trauma care providers, but whatever method is used, trauma patients will receive the best care when there is a *team leader* who ensures that everybody involved is able to articulate the particular local strategy, and that all involved know their tasks and responsibilities.

Trauma education programs need to encompass the details of the organisational structure of the team itself. They should also cover the skills necessary for the team leader and team members to translate the local strategy into efficient care for the trauma patient in order to produce the best possible outcome.

Trauma education programs need to formally teach the skills associated with successful teamwork – leadership, role awareness and communication in particular. Appropriate decision making can only occur when the requisite knowledge exists.

Successful resuscitation and management of the trauma patient is an organisational challenge. It depends on all personnel being aware of both clinical practice issues and the functioning of the trauma team. Leadership and decision-making are two vital links in this chain and due consideration must be given to the educational needs of those senior trauma clinicians undertaking this role.

5.6 Disaster Medicine

In Victoria, experience has taught us that the most frequent mass-casualty scenarios are likely to be the result of surface transport accidents, hazardous material incidents and bushfires. Disaster scenarios are infrequent and unpredictable - good disaster planning must consider all potential hazards. It can also be anticipated that most of these possible scenarios have the capacity to produce mass-casualties.

Each hospital that anticipates providing a disaster management medical team should have at any one time, at least one nurse and one medical practitioner familiar with the basic principles of disaster medicine.

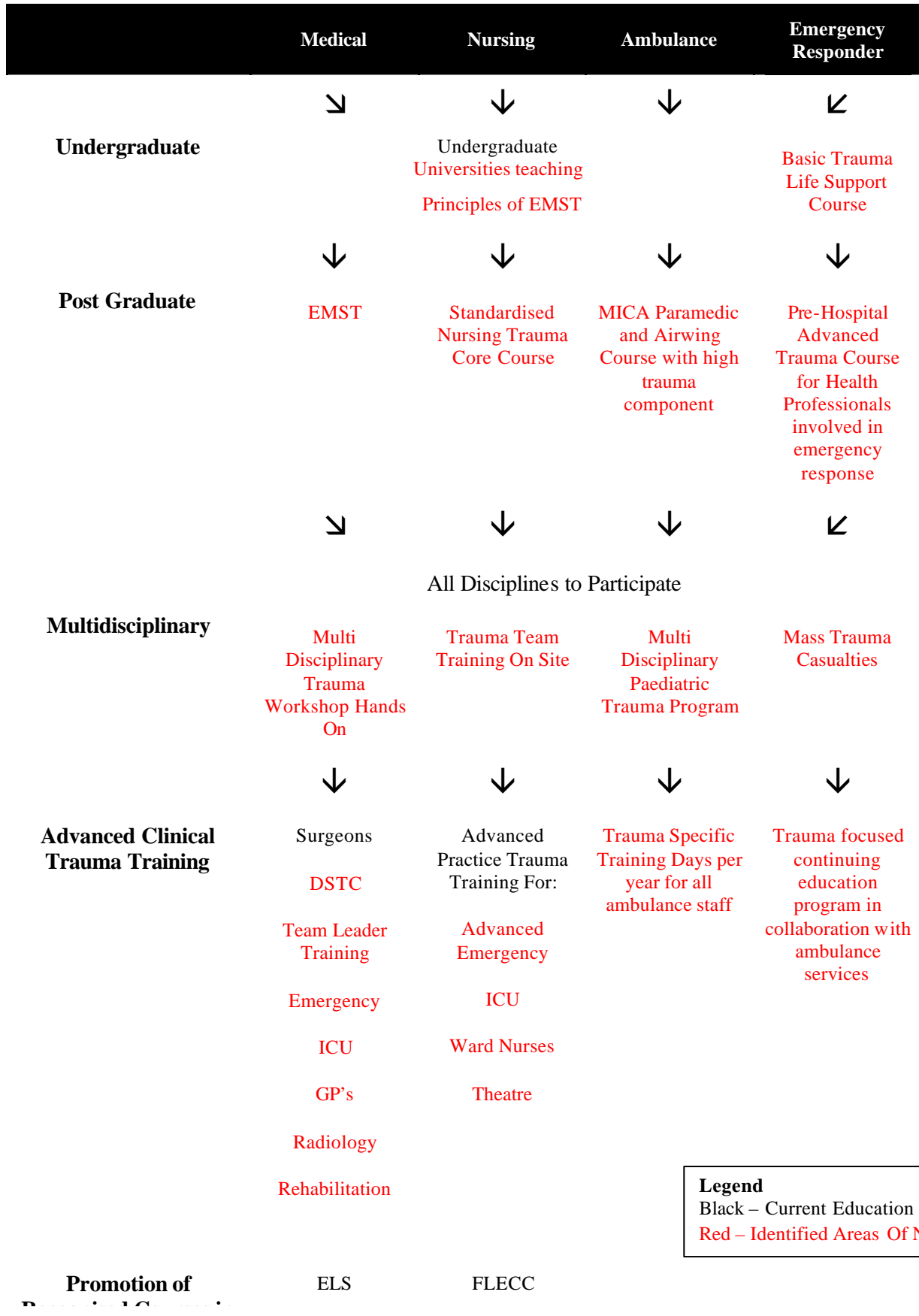
Although disaster medicine is part of the knowledge base of emergency medicine in Australasia, it cannot be assumed that suitably trained and experienced health care professionals will always be available to respond to mass-casualty incidents. Attention must be paid to the educational needs of healthcare staff in relation to disaster medicine.

Basic disaster medicine topics to be covered should include:

1. Key Disaster Management concepts, eg command, control and coordination of disaster response.
2. Disaster Planning, with emphasis on health response planning, especially on adapting to the inevitable time delays to resuscitation and surgery.
3. Disaster management practice, especially triage at the disaster site and in the hospital, and the ethics of “reverse triage”.
4. Training is essential to psychologically prepare health professionals for shifting from identifying the individual patient as the object of concern, to working with groups of patients as the primary object of concern. In mass-casualty situations, in order to provide for the best care for the greatest number, resource limitations can dictate the need to offer less than optimal care for any one patient.
5. Trauma management principles in special circumstances eg. dealing with chemical, biological and radiation contamination in combination with trauma need to be well understood.
6. Principal legal, occupational health and safety issues in disaster medicine as well as the main coronial aspects of mass-casualty incidents.

Figure 3

Trauma Clinical Education Framework



Legend
Black – Current Education
Red – Identified Areas Of Need

**Recognised Courses in
Basic Emergency Care**

Figure 4

Overview of Other Personnel Requiring Trauma Education in Victoria

| Allied Health | Non Medical | Community |
|-----------------------------|---------------|------------------------------|
| Medical Admin | Fire Brigade | St John Ambulance |
| Physiotherapy | Air Crew | State Emergency Service |
| Occupational Therapy | Police | Country Fire Authority |
| Prosthetics | Defence Force | Community Ambulance |
| Social Workers | | Royal Life Saving Society |
| Dieticians | | Work Place Training |
| Chaplains | | Community |
| Speech Pathology | | Red Cross |
| Psychology | | Surf Lifesaving Associations |
| Health Information Managers | | |

6. Barriers To Education

The Education Subcommittee has identified, through its own research and through reference to the work of the BMCG and the *ROTES* report, key areas that are barriers to the implementation of trauma education across the state. The *ROTES* report identified gaps in education programs which cross all disciplines in undergraduate and postgraduate training. The major barrier identified by the BMCG report was “staff having to travel significant distances to access trauma education courses”. High costs, high workloads and lack of accessibility/availability of trauma courses were also identified as major barriers.

The barriers to education can be characterised in three forms:

1. Accessibility

The ability of the individual to attend an educational activity could be related to distance or difficulties with back fill.

2. Availability

Lack of appropriate courses and limited access to existing courses.

3. Financial

Funds to run educational activities; and
Funds to attend educational activities.

The report commissioned earlier by the VTF identified the trauma education needs and barriers for medical, nursing and ambulance personnel. These are:

NEEDS

1. Staff back fill / study leave / funding / availability;
2. Improved courses structures / multidiscipline;
3. Improved education / access;
4. Trauma team / nurse etc training 2 – 3 days;
5. Standards and guidelines for education;
6. Overall improved communication / information;
7. Rotation of staff for skilling up;
8. Coordinated approach to training;
9. Professional bodies to set standards / protocols; and
10. Creation of evaluation and auditing system.

BARRIERS

1. Distance and access to training / courses etc;
2. Lack of access to information technology;
3. Costs of courses / limited funding to provide;
4. Workload / shifts / rostering / study leave;
5. Lack of coordination / promotion / feedback;
6. No multidisciplinary approach;
7. No short 2-3 day course aimed at nurse / ambulance etc;
8. Current delivery methods not practical;
9. Not enough hands on experience; and

10. Professional bodies fragmented.

7. Addressing The Barriers In Trauma Education

In order to provide a comprehensive framework for trauma education in Victoria, barriers to education need to be minimised where practicable. This will allow for equity of access to trauma education for health care providers. Unfortunately minimising the barriers is fraught with difficulties; largely related to the resources required for health care delivery itself. Traumas occur 24 hours a day, seven days a week. Therefore encouraging health care practitioners to attend educational activities is problematic when they are frequently primary healthcare providers. This dilemma will continue to be a challenge for the implementation of the framework as Victoria attempts to provide ongoing trauma education, skills acquisition and skill maintenance.

Although there may be significant barriers to trauma education in Victoria, these can be ameliorated by appropriately prioritised funding. Availability and accessibility of education activities can be addressed utilising modern methodologies for the delivery of education and training. The internet, multi-media and appropriate educational material relevant to the Victorian trauma context should be considered. These facilities need to be available to individuals, institutions and organisations in a cost effective, efficacious manner.

High priority must be given to minimising the barriers. Our most vital resource in managing trauma patients and optimising outcomes are the people who deliver the clinical care.

8. Methods For Delivery Of Trauma Education

A number of different learning methodologies can be utilised for the delivery of trauma education programs. Ideally the methods used should take into account the specific needs of adult learners and may include one or more of the following:

- ◆ **Case Studies** - Focuses on problem solving, decision making, development of analytical skills, team work, process review and self discovery.
- ◆ **Computer Managed Learning** - Includes interactive CD-Rom and video assisted learning, can provide guided learning through complex issues, be self-paced and support remote practitioners.
- ◆ **Critical Incidents** - Case studies which examine critical incidents and assist in developing analytical, problem solving and decision making skills.
- ◆ **Skills Demonstration And Participation** - Supports the development of psychomotor and interpersonal skills and the practice and application of learning.
- ◆ **Group Discussions** - Assists in focusing a group on a learning objective and support deeper understanding of an issue, identification of differences and alternative options and can facilitate process review.
- ◆ **Lectures/Seminars** - Provides information on specific topics to groups of various sizes where there is access to specialist lecturers.
- ◆ **Panel Discussion** - Short lectures by an expert panel with subsequent discussion that encourages analytical review of various viewpoints.
- ◆ **Role Play/Scenarios** - Requires learners to work through strategies and supports practice and application of learning, self discovery, self analysis and skills development.
- ◆ **Simulations** - Encourages team building, practice and application of learning, self analysis and skills development.
- ◆ **Teleconferencing** - Supports large scale training for remote practitioners.

9. Curricula And Education

Trauma education programs should meet the particular needs of all stakeholders in the VSTS. These include first responders, paramedics, specialist and general nurses and medical practitioners.

Programs need to effectively integrate theory with practice and focus on the particular needs of respective professional groups while at the same time ensuring common underpinning principles of trauma practice.

Undergraduate education programs should include appropriate basic trauma modules that provide an overview of the VSTS, specific entry level generic trauma management skills and incorporate appropriate competency assessments or equivalent.

Postgraduate education programs may be formative or focus on review of previously developed competencies and may be specific to professional groups or be multi-disciplinary in nature. These programs should also include an overview of the VSTS and focus on the development of higher-level knowledge and skills in trauma assessment, problem solving and management. These programs should also incorporate formal competency assessments where deemed appropriate by the relevant professional body.

9.1 Development And Co-Ordination Of Educational Programs

The development and coordination of education programs needs to include the involvement of all stakeholders in health care delivery including:

- ◆ The STC;
- ◆ All designated trauma services;
- ◆ RCCECCSs;
- ◆ Ambulance Services;
- ◆ Education providers;
- ◆ Professional colleges; and
- ◆ Practicing clinicians.

To avoid duplication and promote consistency it is critical that the educational framework established throughout Victoria be coordinated on the advice of the STC.

The MTSs are a statewide resource and play a significant lead role in contributing to strategic trauma management educational activities throughout Victoria. The designated Director of Trauma at each trauma service will also play a lead role as the person responsible for the establishment and implementation of coordinated education programs within their facilities in consultation with designated trauma education coordinators.

It is also important that there is multidisciplinary input into education programs wherever possible to ensure stakeholder ownership, and that programs address specific local area needs. This is particularly important in rural areas and should be coordinated through the RCCECCSs in consultation with all relevant trauma services.

10. Evaluation

10.1 Evaluation Of Education

All educational activities require formal evaluation. Ideally, this includes evaluation of the:

- ◆ Overall course;
- ◆ Learning outcomes;
- ◆ Delivery methodologies;
- ◆ Assessment criteria, client satisfaction; and
- ◆ The impact of programs on trauma management throughout Victoria.

Evaluation of trauma education programs is the individual and collective responsibility of government, education providers, the STC, trauma services, RCCECCSs and the respective professional bodies.

It is proposed that development and delivery of education programs for trauma education throughout Victoria be accompanied by specific evaluation tools that assess these programs against patient outcomes. There are a range of different methodologies that can be followed when evaluating the quality and effectiveness of education programs. One of the most commonly used is Kirkpatrick's four-level model of training evaluation⁽⁵⁾ outlined below:

Reaction - How participants react to the program, i.e., a measure of customer satisfaction.

Learning - The extent to which participants improve their skills and knowledge as a result of the program.

Behaviour - The extent to which participants show a change of behaviour as a result of the program, i.e., use their skills and knowledge on the job.

Results - The final result of participants having attended the program, i.e., the overall impact on individual or organisational performance.

10.2 Evaluating Submissions For Trauma Education

The Education Subcommittee has developed Guidelines to assist in the evaluation of trauma education submissions – these are to be found at Appendix 7.

The following points are outlined in order to act as a guide in the assessment process, of any educational program with respect to its appropriateness, structure and content and timeliness of implementation. The STC, through its Education Subcommittee, will play a major role in ensuring that a consistent approach is used in developing educational programs, and in ensuring that these form part of a structured framework in trauma education. This approach is designed to provide a coherent and consistent education framework for the state, as well as providing a useful tool for the VTF in their assessment of education submissions.

1. The education program submission is consistent with the co-ordinated and planned statewide approach to trauma education.
2. That the barriers identified in the Framework, with respect to implementation of educational programs, have been addressed, where relevant, in the program submission being considered.
3. The program should reflect the timeframe of the development of the VSTS, and ideally be implemented at an appropriate time within that timeframe. This refers both to new education programs and to the ongoing development of existing programs.
4. The implementation of trauma education programs should address the deficiencies identified in the Framework document, with respect to the current matrix of educational programs.
5. The education program should address appropriate clinical management issues, and specifically:
 - ◆ Meet areas of deficiency in trauma care, as outlined by the MTMS and CCRTF studies;
 - ◆ Include a common set of principles based upon accepted guidelines/algorithms and protocols;
 - ◆ Meet the needs of one or more professional groups, as identified in the needs analysis in the framework document; and
 - ◆ Where appropriate, take a multidisciplinary approach, reflecting the trauma team methodology.
6. The education program should address system issues by the following criteria:
 - ◆ Outlining, where relevant, protocols and processes consistent with Triage and Transfer Guidelines; and
 - ◆ Be consistent with *ROTES* report recommendations for care of the trauma patient.
7. The educational program should contain reliable and practical methods for evaluation of the effectiveness of the program itself.

10.3 Ongoing Identification Of Areas Of Deficiency

Targeting priority areas for educational activity is crucial. This can be achieved in an ongoing fashion as the VSTS develops. There are a number of ways that areas of need can be identified. These include:

- ◆ The Victorian State Trauma Outcome Registry and Monitoring Group (VSTORM). The aim of this group is to ascertain the effectiveness of the system and to provide ongoing monitoring of the major trauma patients. This includes a data registry, which will assist in the development of quality indicators and analysis of system performance. These indicators will highlight issues in trauma management.
- ◆ Morbidity and mortality audits conducted regarding major trauma management.
- ◆ A trauma verification process. The Royal Australasian College of Surgeons is currently piloting a verification project for trauma services throughout Australasia. The aim is to assess the structure and function of the trauma system, particularly at a hospital level, in the process of management of major trauma patients. Areas of deficiency will be highlighted in this process.

The Education Subcommittee recommends that evaluation findings be fed back through STC mechanisms, so that areas of deficiency can be targeted in ongoing educational activities.

11. Implementation Strategy

Co-ordinated and effective management is required in order to secure optimal treatment for major trauma patients throughout their hospital stay. The four most significant educational priorities to achieve this are:

1. Training of all personnel in triage and communication and establishment of the VSTS processes;
2. EMST training for medical practitioners dealing with trauma patients;
3. Developing a standardised nursing trauma core course; and
4. Identifying and training trauma leaders in the medical and nursing fields.

In addition, in no particular order, the remaining priorities are:

- ◆ Secondment to overseas and local MTSs;
- ◆ Delivery of advanced surgical skills course;
- ◆ Developing multidisciplinary trauma courses to serve as core training and refresher vehicles;
- ◆ Developing Trauma Fellowship program;
- ◆ Developing continuing education for ambulance, and nurses in the following areas: Ward, Intensive Care Unit, Emergency Department, and Operating Room; and
- ◆ Developing guidelines algorithms and protocols for trauma care.

12. Ongoing Professional Education

12.1 Required Basic Education Levels

The concept of the Trauma Panel is an important one to establish within the VSTS. The Trauma Panel consists of health professionals who are responsible for the management of trauma patients within a hospital. The scope of the Panel in a MTS, for example would include a core group of surgeons who manage trauma frequently, and a broader group of surgeons who participate in the acute admission process of trauma patients, but have a less intensive involvement with ongoing care. All of these surgeons would be included in the Trauma Panel for surgery at the hospital. The Panel is therefore, defined as a group of professionals (nursing and medical) who have all been trained at an accepted level, or higher, in the management of trauma. The level of training is in accordance with the level of service provision required.

Table 3 outlines the expected minimum educational requirements regarded as standard for different professional groups at different levels of trauma service provision.

It should be noted that the recommended levels are the minimum standard. Further specific training is available through each separate professional group in many instances.

It is the responsibility of the Director of Trauma Services in the hospital or region to ensure that the members of the Trauma Panel have attained the appropriate educational level.

12.2 Skills Maintenance In The VSTS

The maintenance of skills in the VSTS should be of active concern to the Director of Trauma Services in each hospital and/or region, and to the hospital trauma committee. In-service training programs and specific refresher courses, for example a Multidisciplinary Trauma Course, should be provided to maintain skill levels as outlined in Table 3.

12.3 The Role Of The Major Trauma Services In Training And Education

The MTSs are regarded as key resources in the state for the management of major trauma patients, and for the development and provision of educational programs. They are also regarded as lead agencies in trauma research.

It is critically important that the MTSs work in collaboration with other service providers, including Metropolitan and Regional Trauma Services, in ensuring the development and provision of appropriate educational programs in the VSTS. The expertise developed in the MTSs should be utilised to the maximum in this way.

Table 3

Recommended Minimum Educational Requirements

| | | Level 1 | Level 2 | Level 3 | Level 4 |
|----------------|---|-----------------------------|---|-----------------------------|-------------------------------|
| | | Major Trauma Service | Metro Trauma Service & Regional Trauma Service | Urgent Care Service | Primary Injury Service |
| Surgery | General | EMST | EMST | EMST | N/A |
| | Orthopaedic | DSTC | DSTC | DSTC | |
| | Neurosurgery | CPE | CPE | CPE | |
| | Cardiothoracic Surgery | (MTC) | (MTC) | (MTC) | |
| Medical | Anaesthetist & ICU | EMST *** CPE (MTC) | EMST *** CPE (MTC) | EMST *** CPE (MTC) | EMST MTC CPE |
| | Emergency Physician | EMST *** CPE MTC | EMST CPE MTC | EMST CPE MTC | EMST MTC CPE |
| | General Practitioners & Hospital Medical Officers | EMST MTC CPE | EMST MTC CPE | EMST MTC CPE | EMST MTC CPE |
| Nursing | Emergency Department | CTNC MTC CPE | CTNC MTC CPE | CTNC MTC CPE | (CTNC) MTC CPE |
| | ICU | (CTNC) *** CPE | (CTNC) *** CPE | N/A | N/A |
| | Ward | *** CPE | (CTNC) *** CPE | (CTNC) *** | (CTNC) MTC CPE |
| | Operating Room | CTNC CPE | CTNC CPE | MTC (CTNC) CPE | N/A |
| | Ambulance | MTC *** CPE | MTC *** CPE | MTC *** CPE | MTC CPE |

Legend:

- MTC Multidisciplinary Trauma Course (refresher or initial)
- CTNC Core Trauma Nursing Course
- *** Signifies the need for development of core courses specific to each professional group or speciality
- CPE Continuing Professional Education

() Brackets indicate an optional course - of significant benefit, but not compulsory

13. Criteria For The Endorsement Of Trauma Education Programs

The endorsement of trauma education programs will provide government, health professionals, employers and funding bodies with the reassurance that programs they are undertaking contain the agreed core elements for the respective disciplines and are aligned with the direction of the VSTS.

Endorsement also provides direction to education providers seeking to develop undergraduate and postgraduate trauma programs for Victorian health professionals involved in trauma management.

It is suggested that an agreed and structured process for the endorsement of courses is developed. The following framework could be utilised:

13.1 Proposed Assessment Framework

- ◆ Nominal duration and delivery methods are sufficient to meet the learning outcomes of the program.
- ◆ The program is delivered by appropriate instructors with formal background in the discipline that the program targets.
- ◆ The program briefly demonstrates its relevance to the VSTS. This could include areas such as history, the evidence base supporting its development, system structure and the role of all stakeholders.
- ◆ The program includes the principles of the EMST as identified by the Royal Australian College of Surgeons.
- ◆ The program has been endorsed by the Victorian branch of the respective professional bodies of the participants that the program targets.
- ◆ The program incorporates trauma competencies and clinical practice guidelines for the targeted disciplines which have been endorsed by the respective professional bodies and by the STC and Victorian MTSs.
- ◆ The program includes formal knowledge and competency assessments appropriate to the learning outcomes.
- ◆ Short programs do not necessarily need to be endorsed; however if a localised rural program is developed the program should be reviewed by the RCCECCSs.
- ◆ Educational programs may or may not include formal assessments and this should be reflected in any certification issued. The assessment of competencies will be left in the province of respective professional bodies.
- ◆ The program is being delivered by, or in partnership with, a professional body; university or approved vocational education provider.
- ◆ Evidence that the provider has quality assurance and quality improvement frameworks in place to measure course outcomes and client (including employer where appropriate) feedback.

Appendix 1

Major Trauma Management Study – Management Problems – Type And Site

| | Pre-Hospital | Emergency Department | In-Hospital | Inter-Hospital Transfer | Total |
|------------------------------------|--------------|----------------------|-------------|-------------------------|------------|
| Number Of Patients With Problems | 61 | 75 | 60 | 21 | 217 |
| Delay In / Inappropriate Diagnosis | - | 44 | 12 | 9 | 65 |
| Delay In / Inappropriate Treatment | | | | | |
| 1. ETT | 43 | 20 | - | 3 | 66 |
| 2. Fluids | 11 | 12 | - | 2 | 25 |
| 3. 'Other' (See Table 2.) | 16 | 28 | 76 | 14 | 134 |
| Total Problems | 70 | 104 | 88 | 28 | 290 |

Major Trauma Management Study - "Other Management Problems"

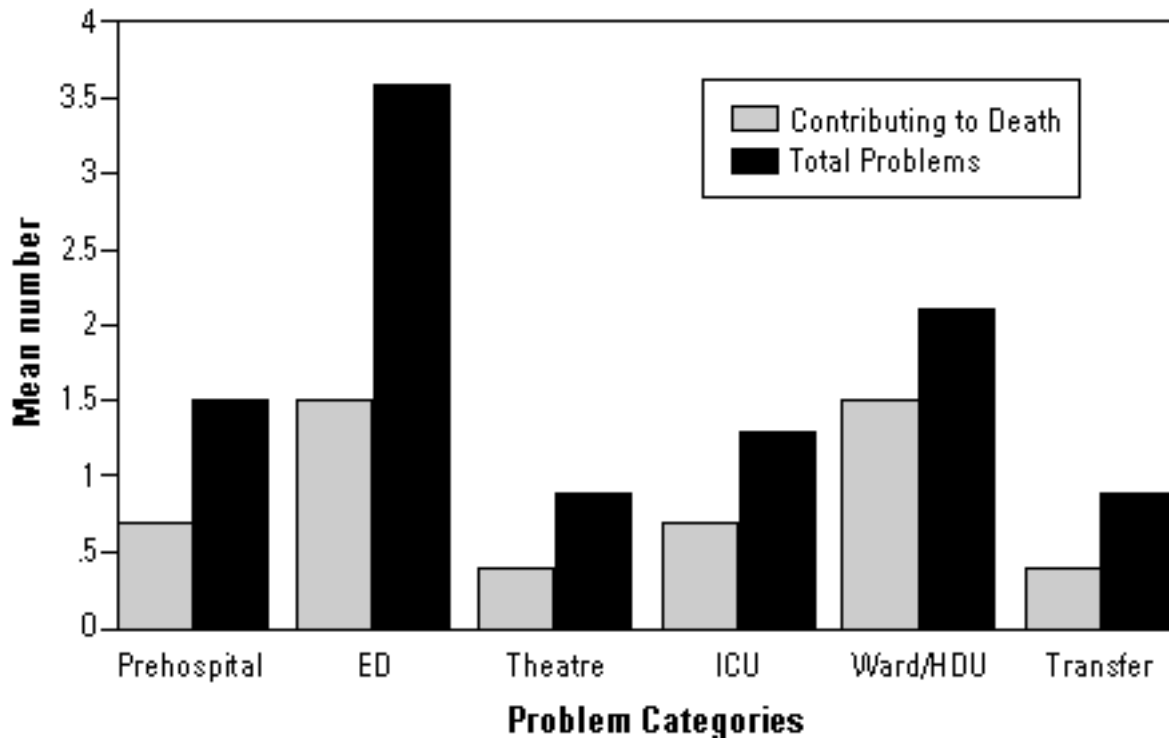
| | Pre-Hospital | Emergency Department | Inter-Hospital Transfer | In-Hospital |
|---|--------------|----------------------|-------------------------|-------------|
| Too Long At Scene | 15 | | | |
| Long Transit Time | 1 | | | |
| Delay To Theatre | | 10 | | |
| Surgeon Not Notified | | 1 | | |
| Poor Pre-Op Work-Up | | 3 | | |
| Delay In Treatment | | 14 | | |
| Delay In Inter -Hospital Transfer | | | 10 | |
| No Doctor With Transfer | | | 4 | |
| Delay To Surgery | | | | 35 |
| Delay Of Surgeon | | | | 2 |
| Non, Or Delayed, ICP | | | | 26 |
| 'Poor Management' | | | | 10 |
| Return To OR | | | | 1 |
| Underlying Patient Condition Mis-Assessed | | | | 2 |
| Totals = 134 | 16 | 28 | 14 | 76 |

Source:

Adapted from 'The Major Trauma Management Study: An analysis of the efficacy of current trauma care'. Danne P, Brazenor G, Cade et al (1998). Aust. NZJ.Surg 68: 150 - 157

Appendix 2

Mean Number of Problem Categories Per Patient Per Area Of Care And Their Contribution To Death (CCRTF 1996).



Appendix 3

Excerpt from *ROTES* Recommendations

Education And Training

- ◆ Undergraduate, postgraduate and continuing education needs of all staff involved in trauma care be considered and fulfilled through the Victorian state trauma system.
- ◆ Cooperative effort between universities, specialist colleges and hospitals in the implementation of education strategies.
- ◆ Major Trauma Services function as “resource centres” making available consistent, common information about education and training options.
- ◆ Better integration of the large number of training courses currently available for the multiple disciplines engaged in trauma care.
- ◆ The Director of Trauma Services in each hospital ensure the provision of appropriate strategies to meet the educational needs of hospital staff involved in the care of trauma patients.
- ◆ Team leaders and all senior medical staff managing major trauma be at least qualified in Early Management of Severe Trauma.
- ◆ The statewide introduction of a single, standard training course that is accessible for Victorian nurses involved in trauma care and integrated with other existing training courses.
- ◆ Inexperienced and staff participating in trauma resuscitation have senior staff supervision.
- ◆ Principles of trauma management be a component of undergraduate medical and nursing education.
- ◆ The educational strategies of the Rural Doctors' Association of Victoria Lives @ Risk Committee and the Rural Workforce Agency Victoria be promoted.
- ◆ Difficulties in participation of general practitioners especially from rural areas, in attending training courses, such as Early Management of Severe Trauma and Advanced Paediatric Life Support be further considered.
- ◆ Regional Consultative Committees on Emergency and Critical Care Services develop and implement trauma education plans for their local area in consultation with the State Trauma Committee.
- ◆ The State Trauma Committee develop an appropriate model for training multidisciplinary prehospital teams in rural areas.

- ◆ Ambulance / MICA paramedics be adequately trained to participate in trauma team management in regional / rural emergency departments as appropriate.
- ◆ Innovative education processes, such as mobile simulators, telemedicine and multidisciplinary training, be developed to maintain the skills for personnel who have rare exposure to trauma and medical emergencies.
- ◆ The role of the Victorian state trauma system, including public education, is important to the success of injury prevention strategies.
- ◆ Collaboration of the Victorian state trauma system with other key stakeholders in injury prevention to:
 - Support public education;
 - Strengthen the measures that provide effective injury prevention;
 - Increase the adoption and enforcement of safety legislation or policies; and
 - Contribute to injury research.

Research, Service And Technology Developments

- ◆ Statewide application of telemedicine in the neurosurgical management of major trauma patients.
- ◆ Integration of telemedicine links.
- ◆ Maturation of clinical information systems.
- ◆ The introduction of digital communication systems.
- ◆ Technological developments that speed diagnosis of critical injuries.
- ◆ Introduction of service and technology developments that have a proven efficacy and value for the health care system.

Funding

- ◆ A tiered strategy for investment prioritising the following key areas:
 - System coordination mechanisms, including data collection, analysis and dissemination
 - Targeted trauma education and training
 - Enhanced primary transport and secondary retrieval services
 - Hospital staffing levels that meet role delineation specifications.
- ◆ Purchasing options that support the system improvement strategies recommended by the Taskforce, such as triage and transfer of major trauma patients to Major Trauma Services according to appropriate guidelines.
- ◆ Purchasing options to be further developed with key providers and stakeholders during the implementation stage.

Appendix 4

Common Management / System Errors

1. Prehospital

- ◆ No paramedic / delay in arrival of MICA;
- ◆ Prolonged time at scene;
- ◆ No “scoop and run”;
- ◆ Inadequate documentation / observations;
- ◆ No / delayed intubation or definitive airway management;
- ◆ Inadequate ventilatory resuscitation;
- ◆ No / delayed / inadequate IV access and fluid resuscitation;
- ◆ Failed intubation / IV access; and
- ◆ No / delayed chest decompression.

2. Emergency Department

- ◆ Inappropriate reception by junior staff;
- ◆ Delayed arrival of appropriate consultant;
- ◆ No consultant general surgeon;
- ◆ No / delayed neurosurgical consultation;
- ◆ Inadequate documentation / observations;
- ◆ No / delayed chest decompression;
- ◆ Delayed / inadequate ventilatory resuscitation;
- ◆ Inadequate fluid / blood resuscitation;
- ◆ External haemorrhage control problems;
- ◆ No / delayed CT investigation;
- ◆ Appropriate investigations delayed / unavailable;
- ◆ Infrequent Arterial Blood Gases / O₂ monitoring;
- ◆ No Central Venous Pressure / inadequate perfusion monitoring;
- ◆ Inadequate management of hypothermia;
- ◆ Inappropriate drugs / dosage;
- ◆ Delay in despatch to theatre; and
- ◆ Delay in interhospital transfer.

3. Intensive Care Unit, Ward / High Dependency Unit

- ◆ Insufficient / delayed fluids;
- ◆ Insufficient / delayed blood transfusion;
- ◆ Insufficient / delayed coagulation factors;
- ◆ No jugular vein Pressure / Central Venous Pressure assessment;
- ◆ Inadequate / inappropriate respiratory support;
- ◆ Inadequate respiratory assessment;
- ◆ Inadequate / inappropriate chest injury assessment;
- ◆ Inadequate / inappropriate analgesia;
- ◆ Delayed / inadequate chest drain;
- ◆ Inadequate / delayed abdominal assessment;
- ◆ Delayed / no general surgical consultation;
- ◆ Delayed / no repeat CT brain;
- ◆ No Intra Cranial Pressure monitoring;
- ◆ Inadequate cerebral perfusion pressure;
- ◆ Delayed / no neurosurgical consultation;
- ◆ No Deep Vein Thrombosis prophylaxis;
- ◆ Fractures not fixed;
- ◆ Delayed transfer to operating theatre; and
- ◆ Delayed transfer to ICU.

4. Transfer

- ◆ Delayed response of transport;
- ◆ No medical escort/inappropriate escort;
- ◆ Inappropriate form of transport; and
- ◆ Inadequate warming.

Source:

Adapted from Evaluation of the Emergency and Clinical Management of Road Traffic Fatalities in Victoria 1997. Report of the Consultative Committee on Road Traffic Fatalities in Victoria, 30 September 1998.

Appendix 5

Balanced Management Report - Summary Of Recommendations

Please note: These recommendations were contained in the Balanced Management report to the VTF which provided a needs analysis of trauma education throughout Victoria. The Education Subcommittee recognises the usefulness of presenting the recommendations for reference as the report received only limited distribution.

1. A Coordinated Approach

The project team recommends:

Recommendation 1 - The Major Trauma Service Statewide Coordination Unit is re-introduced to provide a forum for coordinating trauma education across Victoria.

Recommendation 2 - The role and responsibilities of each of the Regional Consultative Committees on Emergency and Critical Care in relation to trauma education within the trauma system, needs to be clarified further by the STC.

Recommendation 3 - A Director of Trauma to be appointed at each hospital that is designated to receive major trauma to ensure that educational needs of staff are met.

Recommendation 4 - All MTSs, MeTSs and RTSs need access to a Trauma Coordinator for the purpose of managing and implementing trauma education and evaluation.

Recommendation 5 - All Trauma Coordinators in Victoria to meet regularly to ensure ongoing coordination throughout the state.

Recommendation 6 - An education trauma committee, with a multidisciplinary focus, to be established at the MTS, MeTS and RTS. The membership of this committee should include The Director of Trauma, the Trauma Coordinator, the Ambulance Service and any other relevant personnel as decided by the Committee.

2. Consistent Education

The project team recommends:

Recommendation 1 - A standardised and coordinated approach to patient care through the implementation of statewide protocols and guidelines for the specific management of trauma care.

Recommendation 2 - Professional colleges, societies and associations develop a minimum standard of trauma education hours that should be achieved annually across all disciplines.

Recommendation 3 - Professional colleges, societies and associations develop clinical competencies in relation to trauma.

Recommendation 4 - Credentialing occur at each hospital. Following the USA guidelines, this should include skills proficiencies, training requirements, conference attendance and education requirements.

3. Learning Trauma-Related Skills: Multidisciplinary Trauma Education

The project team recommends:

Recommendation 1 - The development and implementation of a multidisciplinary training day for medical, nursing and ambulance personnel. This day should include evidence-based updates on trauma management, case scenarios and practical skill stations. This should be located on site at the MTSSs, MeTSSs and the RTSSs, which would incorporate the UCSs.

Recommendation 2 - Individual hospitals designated to receive major trauma implement at least quarterly trauma team scenario training sessions at their hospital, including medical, nursing and ambulance personnel, including community volunteers in the rural areas.

Recommendation 3 - Hospitals conduct trauma case presentations/audits on a monthly basis. This should include all personnel involved in the care of the patient from injury to discharge.

Recommendation 4 - The Royal Children's Hospital coordinates the development of a multidisciplinary focused one-day specific paediatric trauma course.

4. The Ambulance Services

The project team recommends:

Recommendation 1 - All Paramedic and MICA personnel participate in a pre-hospital trauma core short course, post the completion of their relevant education at Monash University.

Recommendation 2 - Paramedics/MICA must include a set number of continuing trauma education hours per year within their existing two days of refresher training.

Recommendation 3 - Increased trauma education for Paramedics and MICA staff within rural Victoria. For this reason, it is recommended that a working party should be established to review the location and methods of education delivery for the Diploma course and MICA courses currently being conducted at Monash University (Frankston campus only).

Recommendation 4 - Monash University provide further practical based scenarios within the Diploma of Ambulance Paramedic Services.

Recommendation 5 - Paramedics/MICA stationed in rural areas should rotate through larger stations.

Recommendation 6 - All community volunteers participate in a one-day basic trauma education program, incorporating the principles of Basic Life Support.

5. Nursing

The project team recommends:

Recommendation 1 - The development of a standardised 2-3 day nursing trauma core short course for all nurses involved in trauma care in Victoria.

Recommendation 2 - The Emergency Nurses Association Victoria, coordinate the development of a one-day advanced trauma resuscitation course targeted to emergency nurses.

Recommendation 3 - The Australian College of Critical Care Nurses, coordinate the development of a one-day specific Intensive Care trauma course targeted at nurses working in this area.

Recommendation 4 - The MTS coordinate a one-day course for MTS-based ward staff, which focuses on the ongoing management of the trauma patient.

Recommendation 5 - All hospitals designated to receive major trauma need access to an on-site educator for the purpose of ongoing clinical education and bedside support. The contact hours required for this role need to be determined in an independent review.

Recommendation 6 - Nurses from the MeTSs, RTSs and UCSs rotate through the MTSs to maintain/increase their exposure and understanding of managing major trauma.

Recommendation 7 - The issue of access to education to be further explored by each hospital designated to receive major trauma.

Recommendation 8 - Rural nurses consider participating in the First Line Emergency Care Course, a course designed to provide basic emergency skills.

6. Medical

The project team recommends:

Recommendation 1 - The principles of Early Management of Severe Trauma (EMST), to be a component of undergraduate medical education.

Recommendation 2 - The EMST course to be made the minimum standard for all medical personnel involved in major trauma patient management in Victoria.

Recommendation 3 - To ensure EMST is the minimum standard for medical personnel, professional bodies need to endorse this standard.

Recommendation 4 - Royal Australasian College of Surgeons increases the number of EMST courses offered on an annual basis.

Recommendation 5 - The Definitive Surgical Trauma Course, to be promoted and made more accessible to surgeons in Victoria.

Recommendation 6 - General Practitioners affiliated with either RTSS or UCSs participate in the Advanced Paediatric Life Support course.

Recommendation 7 - The Emergency Life Support Course to be promoted further throughout regional/rural Victoria.

Recommendation 8 - Medical personnel from the MeTSs RTSS and UCSs rotate through the MTS to maintain/increase their exposure and understanding of managing major trauma.

7. Evaluation

The project team recommends:

Recommendation 1 - Hospitals explore the possibility of incorporating “live video” in the resuscitation room for the purpose of evaluating current practices and identifying future education needs.

Recommendation 2 - The Simulation Centre at Monash Medical Centre, Moorabbin campus to be considered for future evaluation in trauma education in Victoria.

Recommendation 3 - Hospitals maintain a major trauma database with patient care audit filters. This will allow for evaluation of care, and set standards throughout the state.

Recommendation 4 - A monthly trauma case audit to be conducted in the hospitals designated to receive major trauma.

Recommendation 5 - All trauma training programs have an evaluation component pre and post course.

8. Access To Education

The project team recommends:

Recommendation 1 - All staff involved in trauma care have access to Internet.

Recommendation 2 - Hospitals have better access to teleconferencing.

Recommendation 3 - All three MTSs provide teleconferencing throughout Victoria.

Recommendation 4 - The MTSs establish and maintain a trauma web site. This web site should include case scenarios, updated trauma protocols, journal links and an

education registry with all upcoming trauma related education links to relevant web sites.

Recommendation 5 - The identification of trauma-related software education packages that can be incorporated into the ongoing education and skills development of trauma personnel.

Appendix 6

Professional Resources For The Management Of Major Trauma Patients In Victoria

The upper level of estimation of major trauma patient numbers in Victoria, per year, is approximately 2000. Sixty per cent of major trauma patients have significant head injuries, and require neurosurgical participation in management. Eighty per cent have orthopaedic injuries and require the services of orthopaedic surgeons. Most of these patients are multi-trauma patients and should be admitted under the bed card of the General Surgeons.

If a MTS is to admit 500 major trauma patients in a year, each of 15 General Surgeons would manage 33 patients only. Each of five Neurosurgeons would manage 40 patients, and each of 12 Orthopaedic Surgeons, approximately 33 cases.

If the patient load is 50 major trauma cases a year, such as occurs at many Metropolitan Trauma Services, 10 General Surgeons would manage five cases each, 4 Neurosurgeons eight cases, six Orthopaedic Surgeons seven cases each.

If the patient load is 20 major trauma cases per year, as at some Metropolitan Trauma Services and some Regional Trauma Services, six General Surgeons would manage approximately three cases each per year, and four Orthopaedic Surgeons approximately four cases each per year.

The exposure of Emergency Physicians and Anaesthetists would be similar to that of General Surgeons in that Institutions mentioned above.

The exposure of Intensivists would be larger.

The exposure of nursing staff within the hospitals would be significantly less, due to the strict shift work basis of rostering.

Appendix 7

GUIDELINES FOR THE EVALUATION OF TRAUMA EDUCATION SUBMISSIONS

The State Trauma Committee outlines a number of priority areas for trauma education in Victoria in its document, “A Trauma Education Framework for Victoria”. *It is important to read the Framework in its entirety and to ensure that proposals reflect the Framework’s Recommendations (p 4). The following criteria, further articulated in the document, may be of assistance in evaluating trauma education submissions.*

Does the proposed educational activity meet one of the current identified gaps in trauma education? These are identified in Figure 1, “Overview of Current Trauma Clinical Education in Victoria” (p 12) and are summarised below:

- ◆ No undergraduate nursing or multidisciplinary trauma courses currently exist.
- ◆ There is a lack of dedicated trauma training at postgraduate level for all disciplines except medical (that is, nursing, ambulance and multidisciplinary).
- ◆ A number of postgraduate speciality training programs lack a trauma component.
- ◆ Specified advanced trauma training, whilst available for surgeons and Air MICA ambulance officers, is not available for other groups.

Yes No

Does the proposed educational activity address one of the trauma management deficiencies set out in Table 2, “Education in Relation to CCRTF / MTMS Deficiencies” (p 17)? The CCRTF and MTMS reports have identified a need for:

- ◆ The development of experienced senior leaders in the management of trauma patients.
- ◆ Clearly identified system processes for pre-hospital management, inter-hospital transfer or in-hospital management (guidelines, algorithms and protocols).
- ◆ Upskilling of personnel involved in the care of the trauma patient.

Yes No

To what extent does the proposed educational activity address the following trauma education priorities identified in Section 11, “Implementation Strategy” (p 30)?

Top four, in order of importance:

1. Training of all personnel in triage and communication and establishment of Victorian trauma system processes.
 2. EMST training for medical practitioners dealing with trauma patients.
 3. Developing a standardised nursing trauma core course.
 4. Identify and training trauma leaders in the medical and nursing fields.
-

The remaining priorities, in no particular order, are:

- ◆ Secondment to overseas and local Major Trauma Services.
- ◆ Delivery of advanced surgical skills course.
- ◆ Developing multidisciplinary trauma courses to serve as core training and refresher vehicles.
- ◆ Developing Trauma Fellowship program.
- ◆ Developing continuing education for ambulance, and for nurses in the following areas: Ward, Intensive Care Unit, Emergency Department, and Operating Room.
- ◆ Developing guidelines, algorithms and protocols for trauma care.

Comments:

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Does the proposed educational activity address the following barriers to trauma education outlined in Section 6, “Barriers to Education” (p 23)?

| | | | | | | |
|---|-----|--------------------------|----|--------------------------|-----------|--------------------------|
| Distance | Yes | <input type="checkbox"/> | No | <input type="checkbox"/> | Partially | <input type="checkbox"/> |
| Time constraints for trauma practitioners and difficulties with back-fill | Yes | <input type="checkbox"/> | No | <input type="checkbox"/> | Partially | <input type="checkbox"/> |
| Lack of flexible delivery methods of current trauma education | Yes | <input type="checkbox"/> | No | <input type="checkbox"/> | Partially | <input type="checkbox"/> |
| High costs of trauma education | Yes | <input type="checkbox"/> | No | <input type="checkbox"/> | Partially | <input type="checkbox"/> |
| Single discipline focus of current education programs | Yes | <input type="checkbox"/> | No | <input type="checkbox"/> | Partially | <input type="checkbox"/> |

Table 3, (p32) specifies minimum educational requirements for each trauma service level. Are these addressed for each of the occupational groups targeted in the proposed educational activity and at which service levels? The four levels of trauma service are:

- ◆ Major Trauma Service; Yes No
- ◆ Metropolitan Trauma Service & Regional Trauma Service; Yes No
- ◆ Urgent Care Service; and Yes No
- ◆ Primary Injury Service Yes No

Any proposed educational activity with a clinical focus should include the following core components:

- ◆ Primary Survey;
- ◆ Resuscitation interventions:
 - ? ABC;
 - ? Neurological;
 - ? Environment;
 - ? Exposure;
- ◆ Secondary Survey;
- ◆ Definitive Care:
 - ? Stabilisation;
 - ? Inter Hospital transfer; and
- ◆ Multidisciplinary teamwork:
 - ? Leadership;
 - ? Communication;
 - ? Teamwork.

Are these principles included in clinical programs?

Yes **No**

Are there any additional issues for consideration, for example:

- Does the course address VSTS structures and policies? **Yes** **No**
- Is the course consistent with trauma service levels outlined in the *ROTES* report? **Yes** **No**
- Where appropriate, is there a multidisciplinary component to the program? **Yes** **No**
- In relation to regional and rural trauma education, is the proposal consistent with the RCCECCS' Emergency and Critical Care Plan? **Yes** **No**
- Where appropriate, has the professional association's endorsement been sought? **Yes** **No**
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References

1. *The Review of Trauma & Emergency Services – Victoria 1999, (ROTES) Report*, The Department of Human Services, 555 Collins Street Melbourne.
2. *Report of the Consultative Committee on Road Traffic Fatalities in Victoria*, McDermott, FT., Cordner SM., Tremayne AB (1998). Consultative Committee on Road Traffic Fatalities in Victoria.
3. *The Major Trauma Management Study: An analysis of the efficacy of current trauma care*, Danne P, Brazenor G., Cade, R *et al.* (1998). Aust. NZ J. Surg. 68: 150-157.
4. *Developing a Comprehensive Framework for Education and Skills Development for Trauma and Emergency Personnel in Victoria*, November 2000. Victorian Trauma Foundation. Report prepared by “Balanced Management Consultancy Group”.
5. *Evaluating Training Programs: The Four Levels*, Kirkpatrick, D.L San Francisco: Berrett-Koehler Publishers (1994).