

TRAUMA SYSTEM ACCREDITATION GUIDELINES

Trauma Association of Canada
Association Canadienne de Traumatologie

Fourth Revision
June 2011

TABLE OF CONTENTS

Section I	Accreditation Program	<u>3</u>
Section II	Trauma Systems	<u>7</u>
Section III	Levels of Trauma Centres	<u>17</u>
	• <i>Level I</i>	<u>19</u>
	• <i>Level II</i>	<u>22</u>
	• <i>Level III</i>	<u>25</u>
	• <i>Level IV</i>	<u>27</u>
	• <i>Level V</i>	<u>29</u>
	• <i>Pediatric Level I</i>	<u>31</u>
	• <i>Pediatric Level II</i>	<u>34</u>
	• <i>Adult Centres Treating Pediatric Trauma</i>	<u>37</u>
Section IV	Criteria for Provincial & Regional Trauma Systems	<u>38</u>
Section V	Criteria for Provincial & Regional Emergency Medical Systems	<u>41</u>
Section VI	Criteria for Trauma Centres	<u>43</u>
Section VII	References	<u>49</u>
Section VIII	Appendices	<u>51</u>
	Appendix A	<u>52</u>
	<i>Application for Accreditation</i>	
	Appendix B	<u>55</u>
	<i>Application for Pre-Accreditation Consultation</i>	
	Appendix C	<u>58</u>
	<i>Criteria for Trauma Systems/Centres</i>	
	<i>(Working Document)</i>	
	Appendix D	<u>64</u>
	<i>Pre-Accreditation Questionnaire</i>	
	Appendix E	<u>81</u>
	<i>Schedule of Site Visit</i>	
	Appendix F	<u>84</u>
	<i>Accreditation Evaluation</i>	

Section I TRAUMA ASSOCIATION OF CANADA ACCREDITATION

Background

The Trauma Association of Canada (TAC) is a multidisciplinary association of health care professionals committed to promoting injury control and excellence in trauma care throughout Canada. TAC has established formal liaison with Accreditation Canada and has confirmed an MOU in the last three years to work conjointly in the further development of national standards for trauma care. This relationship continues to evolve in the best interests of improving trauma patient care and evidenced based trauma systems development. In 2011, this Memorandum of Understanding (MOU) between Accreditation Canada and the Trauma Association of Canada (TAC) was revisited and is currently being strengthened. TAC has a national trauma accreditation/verification program and, building on the work TAC has done in this sector, staff from both organizations will work together to develop a collaborative model. A guiding principle of the MOU is to seek ways to avoid and minimize duplication of efforts for client organizations, and to optimize collaboration with other accrediting bodies. (<http://www.accreditation.ca/accreditation-programs/new-initiatives/emergency-health-services/>). Currently, (May 2011), the relationship between TAC and AC continues to evolve with TAC maintaining an independent trauma accreditation/verification process as presented in this document.

Further details concerning TAC accreditation can be found at the official TAC Accreditation Committee website through: www.traumacanada.org

The Accreditation Committee of TAC has been charged with developing guidelines for systems of trauma care in Canada and developing a process for evaluating compliance with these guidelines. The initial TAC guidelines for Trauma Centre Accreditation were formulated and approved in 1993 and subsequently extensively revised in 2003, 2007 and 2011 with an increasing emphasis on trauma systems. As noted, the guidelines for trauma accreditation are periodically updated by TAC in line with recommendations of the TAC executive and its Accreditation Committee.

The Accreditation site/system-review process was initiated in 1995 and since then many of Canada's trauma centres/systems have participated in this process. A current list of accredited trauma systems and centres in Canada is provided on the TAC Website (www.traumacanada.org).

Goals of Trauma Accreditation

The primary goal of the TAC accreditation process is to optimize outcomes for the trauma patient population throughout Canada. The secondary goals are to define national guidelines and assist health ministries/authorities to develop and sustain trauma services in the paradigm of trauma systems.

Development of Guidelines

The TAC Trauma System Accreditation Guidelines have been developed by the TAC Accreditation Committee and are based, where possible, on available published evidence and relevant national and international documents. TAC specifically recognizes the work of the American College of Surgeons Committee on Trauma and its document *Optimal Resources for the Care of the Injured Patient (2006)*, the US Department of Health and Human Services' document *Model Trauma System Planning and Evaluation (Feb, 2006)* and the Royal Australasian College of Surgeons Document, *Model Resource Criteria for Level I, II, III, & IV Trauma Services in Australasia, August 2009*. The TAC Accreditation Committee also acknowledges the extensive input received from the TAC Executive, the membership at large and from previous participants in the accreditation process. TAC also thanks the collaborative support of Accreditation Canada and the Canadian Association of Emergency Physicians for their input into this document as well as the participation of their membership in the TAC Accreditation Committee.

This document has been disseminated widely to the trauma community in Canada as well as all Provincial Governments and Ministries of Health and the Federal Minister of Health. It is also available for review and downloading, with periodic updates, on the TAC Website (www.traumacanada.org).

Process of Accreditation

Compliance with guidelines for trauma systems and trauma centres is assessed through an accreditation process performed by TAC. The following are essential steps in this accreditation process:

- Appropriate health authority designates optimal number and level of trauma centres for provision of trauma services within its region based on need and system design.
- Health authority formalizes trauma system configuration and the component parts of the system within the region, consistent with the provincial/regional trauma plan.
- Health authority develops regional leadership and integrated services consistent with guidelines for both adult and pediatric patients.

- Health authority in collaboration with the regional/provincial trauma program leadership, requests a formal accreditation of its trauma system by TAC including site visits of its Adult and Pediatric Level I – III Trauma Centres. A letter addressed to the TAC President requesting accreditation should be received with a minimum of six months notice of anticipated visit. The letter must be from or clearly sent with the permission of the associated regional/provincial health authority responsible for definitive trauma designation.
- TAC Accreditation Committee will appoint an expert team comprising of trauma physicians and program manager(s). The accreditation team leader will communicate directly with the trauma program leaders to arrange the specifics of the site visit and requirement thereof.
- The Regional Trauma Program/System and each designated Trauma Centre (Level I – III) prepare and submit to the TAC office the completed pre-accreditation questionnaire and supporting documents a minimum of one month before scheduled site visit.
- Regional Trauma Program/System Leaders must ensure that other system components including Emergency Medical Systems, Emergency Preparedness, Rehabilitation Services, and Level IV and V facilities are in compliance with system guidelines and prepare to present appropriate documentation at the time of the Trauma System review.
- The Trauma Program Leaders communicate with TAC Accreditation Team Leader(s) and develop a site visit agenda based on the template provided by TAC.
- A TAC Accreditation Team will perform a site visit to evaluate the provincial and regional systems and component parts including the major Adult and Pediatric Trauma Centres (Level I – III) and their compliance with national guidelines.
- Biographies of the accreditors will be made available to the trauma system undergoing accreditation.
- A draft report will be submitted to the regional trauma leaders within 6 weeks to confirm accuracy of factual information contained in the report with a request for feedback within seven days.
- The final accreditation report will be forwarded to the TAC President's Office within 8-10 weeks of completion of the site visits and then forwarded to the associated CEO of the Regional Health Authority undergoing accreditation shortly thereafter.
- TAC will invoice Health Authority for the accreditation review along with expenses of the accreditation team members per fee schedule outlined below.
- The TAC accreditation process will result in one of the following outcomes:
 - Successful
 - Provisional
 - Unsuccessful
- Successful TAC Trauma System Accreditation is valid for five years at which time a full accreditation review will be required to renew status. Applications for a one-year extension on accreditation status may be granted for extenuating circumstances while a commitment for review is in process.

- Provisional accreditation is valid for one year. Within that time frame the Organizations must demonstrate correction of those deficiencies identified in the review, at which time a full accreditation may be granted. This may require an expedited visit by a TAC accreditation team.
- Systems that are unsuccessful will require a new application for a full review.
- Health Authorities will be invited to provide formal feedback on the accreditation process and team members once a visit and report are complete.

Accreditation Fees

TAC Accreditation fees are:

- \$1000.00 per centre (Level I – III) reviewed
- \$1000.00 per day per accreditor (TAC to determine team configuration and size)
- Accreditor's expenses including; transportation, meals and lodging

Pre-Accreditation Consultation

TAC also offers a consultation process to assist trauma programs in preparation for a formal review. It is anticipated that programs will be at advanced stage of preparation as this process serves as a guide in preparation for the final review. Site documentation and consultation fees are identical to those of a full accreditation.

System Development Consultation

As experts in trauma systems development, TAC is able to provide Health Authorities with the names of individuals who are considered qualified and willing to assist them with a more fundamental trauma system development and design process. Deliverables and fee schedules for this service would be determined on an individual consultant basis.

Section II TRAUMA SYSTEMS

Injury is a major public health concern in Canada and places a significant burden on society in terms of death, disability and financial costs. Injury is the most common cause of death in the first four decades of life, responsible for more deaths in children than all other causes combined, an increasing burden in the elderly, and costs the Canadian economy an estimated \$19.8 billion per year.

<http://www.smartrisk.ca/downloads/burden/Canada2009/EBI-Eng-ExecSumm.pdf>

Injury is no accident; it is often predictable and predicated on defined risks. Demographic, societal, geographic, and other factors combine to define at-risk populations. In Canada, these include children, youth, specific occupations, Aboriginal Canadians and the elderly, each with their own specific risk factors, typical injury mechanism and injury profile. Targeted injury prevention has reduced some of these risks and impacted injury rates and injury death rates from a number of causes notably motor vehicle crashes. <http://www40.statcan.ca/101/cst01/health30a.htm>

Evidence from numerous, national and international jurisdictions indicate that the implementation of comprehensive trauma systems along with a public health approach to injury control reduces both the human and societal costs of injury.

Public Health Paradigm

The public health system provides a suitable conceptual framework for trauma system design and implementation. The three core functions of the public health system have been described as assessment, policy development and quality assurance and equate well with similar components in trauma systems. (Ref. US Department of Health and Social Services document: *Model Trauma Care System*)

A public health approach to injury recognizes that the burden of injury may be reduced and controlled by appropriate prevention strategies. These strategies may be targeted towards preventing events likely to result in injury (primary prevention), towards minimizing the injurious effects of an event (secondary prevention), or towards reducing the morbidity and mortality associated with injury (tertiary prevention). These goals can best be achieved by developing an administrative and legislative framework that brings together the various agencies engaged in these different activities in a coordinated approach to injury control at the regional, provincial and federal levels.

Trauma System Concept

A fully comprehensive and inclusive trauma system is a preplanned, organized, and coordinated injury control effort in a defined geographic area (province or region), which:

- Has an identifiable lead agency.
- Is publicly administered, funded and accountable.
- Engages in comprehensive injury surveillance, reporting and prevention programs.
- Delivers the full spectrum of trauma care from the time of injury to recovery, including:
 - Immediate access to emergency medical services
 - Rapid transport to appropriate level of care
 - Acute services including resuscitation, surgery, critical care and specialty services
 - Rehabilitation and reintegration into the community and workforce
- Engages in research, training and performance improvement.
- Establishes linkages with an all-hazards emergency preparedness program.

Regional trauma systems are based on a population of 1 to 2 million people and consolidate the major trauma caseload into one or possibly two major trauma centres while distributing the larger volume of less severely injured across many acute care facilities. An inclusive system will address the needs of all injured patients irrespective of acuity.

Larger jurisdictions, such as the more populous provinces, will need several regional trauma systems working together and coordinated by a common provincial trauma plan. Regional systems will be largely independent of each other but provide mutual aid in the case of disaster or mass casualty situations and may transfer specific cases to a single lead provincial trauma or specialty centre (quaternary caseload, e.g. burns and spinal cord injury).

Components of a Trauma System

It is important to appreciate that a trauma centre/hospital does not constitute the trauma system, which is a coordinated, multi-agency collaboration for all aspects of injury control in a systematic, structured fashion. A comprehensive and fully inclusive system will have administrative, surveillance, prevention, clinical, training and research elements working in unison. Each component is a vital link in a chain ensuring patient's move quickly and safely along the continuum of care and prevention. Each acute care facility should have a designated and defined role within the system. In rural jurisdictions, all acute care facilities will play a vital role in providing initial trauma care of all injured (inclusive), while in urban jurisdictions, specifically designated centre(s) will be responsible for the majority of major trauma care provided (exclusive). The number of these major trauma centres should be defined by the system leadership and be predicated on need and based on major trauma caseload within the system. Most regional systems serving populations of 1 to 2 million people will require a single level I centre to manage their major trauma caseload (ISS>12)

Trauma system components are listed in (Figure 1.) and are discussed in greater detail elsewhere in this document. The specific criteria deemed essential to the optimal care of the trauma patient are listed in Sections IV, V, and VI.

Figure 1. Trauma System Components

Administrative Components
Lead agency for trauma system
Facilitating legislation
Funding
Development
Evaluation
Clinical Components
Pre hospital services
Access
Communications
Triage
Transport
Stabilization and intervention
Acute care facilities
Trauma centre
Other facilities
Rehabilitation and long term care
Injury Surveillance and Prevention
Research, Education and Training
Emergency Preparedness

Administration

To achieve the goal of a successful and mature trauma system, a lead governmental agency is required with the authority to develop policy to ensure appropriate system planning, trauma centre designation, resourcing, implementation, coordination and evaluation. At the regional level in Canada, this will most likely be the regional health authority or provincial health authority though not all involved trauma system agencies may be under its direct jurisdiction (e.g. EMS).

Ideally the provincial trauma plan encompasses and directs the regional trauma systems development (unless there is a single provincial trauma system) ensuring common guidelines, funding, performance standards, and evaluative process as well as fostering coordination and mutual support agreements between regional systems. The provincial trauma lead agency is responsible for determining the appropriate services required for low incidence, high acuity conditions such as spinal cord injury and major burns (quaternary care – see below).

Lead agencies, whether provincial or regional, require a stakeholder advisory committee with public and expert medical input with participation of pre-hospital services, emergency preparedness program and supported with appropriate data and epidemiological expertise. Roles and responsibilities for these advisory committees are listed in Figure 2. Provincial advisory committees will require representation from all regional systems within their jurisdiction.

Figure 2. Trauma Advisory Committees

1. Advisory to health authority on the development, governance, coordination, performance standards, and configuration of system.
2. Maintains a trauma registry based on ICD coding and ISS scoring.
3. Coordinates research (epidemiological, clinical and basic).
4. Supports development, promotion and maintenance of educational programs.
5. Develops a system wide evaluative performance improvement and patient safety (PIPS) program.
6. Details the need for new resources in the system.
7. Identifies and recommends rehabilitation programs for disabled/injured patients.
8. Coordinates trauma system activity with the regional ambulance and pre-hospital services.
9. Promotes injury prevention measures.
10. Participation in the development of emergency preparedness planning.
11. Develops an annual report.

Emergency Medical Services/Emergency Health Services (EMS/EHS)

EMS, functioning within the overall trauma system, provides a vital component of system success and often predates much of overall patient outcomes immediately post injury event. The goals of the pre-hospital system are to prevent further injury, initiate resuscitation and provide timely and appropriate transport of the injured patient to the most appropriate centre, that is, to match patient's needs to receiving facilities capabilities.

This all must be performed in a regional systematic manner which integrates communication, system status management and the optimal utilization of ground and air transport with personnel skilled in the care of the major trauma patient. This pre-hospital care must be provided with appropriate medical oversight and based upon best evidence available in the form of protocols and/or on line medical direction.

Triage mechanisms to avoid significant under and over triage rates must be integral to the provision of pre-hospital care and monitoring of such rates are inherent to system success. Overall, the demonstration of a highly functional and effective EMS system is a key to trauma systems accreditation. Finally, EMS personnel and resources can be used to deliver other aspects of trauma systems such as injury prevention or education programs where they have been demonstrated to be very effective.

Trauma Centres and Other Acute Care Facilities

Trauma centres play an essential role in the trauma system providing acute care to the most seriously injured, system leadership, and education and research programs. The trauma centre is a medical centre where resources are dedicated and/or prioritized to ensure the acutely injured patient can receive full and timely resuscitation, assessment and definitive care on a 24-hour basis.

The Trauma Association of Canada has defined 5 levels of trauma facilities along with pediatric trauma centre equivalents and recognizes that virtually all our acute care facilities participate in providing trauma care whether that be the initial resuscitation of a major trauma patient in a small community hospital prior to transfer to the trauma centre, or the delivery of a high volume of secondary (non-major) trauma care in a large urban medical centre. These facilities and the work they do complement the major trauma centres and are critical to the successful functioning of the trauma system as a whole. These hospitals are therefore formally included in the descriptions of trauma facilities.

Adult Trauma Centres are classified numerically (Levels I – V) and two levels of Pediatric Trauma Centre (P-I, P-II) have also been defined. Section III of this document discusses in more detail the nature and role of these different trauma facilities and the resource requirements for each level designation are listed in Section VI.

The Emergency Department

Like all links within the continuum of a trauma system, the emergency department plays a vital role. The emergency department is the first place of advanced resuscitative care following EMS and is often the first place of contact with definitive care. The personnel (physicians, nurses, allied health, clerical staff, etc.), resources (physical space, equipment) and coordination of these elements are a complex interplay which affects all aspects of patient care and outcomes.

The goals of the emergency department are fourfold: 1) resuscitation, 2) diagnostic imaging, 3) coordination of specialized care (trauma surgery, orthopedics, neurosurgery, interventional radiology, etc.) 4) and when indicated, transport of the injured patient to a higher level of care institution. Effective communication at all levels along the continuum of care is of paramount importance to achieve timely coordination of personnel and resources. Communication is initiated on-scene by pre-hospital personnel (dispatch, EMS) and is communicated to the receiving hospital (charge nurse, emergency physician, trauma team leader, etc.) such that appropriate personnel (e.g. emergency physician, trauma team, trauma surgeon) and resources (trauma bay preparation, blood bank, etc.) are mobilized. Early and clear communication ensures a well established plan is in place prior to arrival of the injured patient. Upon arrival of the patient, rapid resuscitation is the top priority. The trauma team leader, trauma team and nurses work in concert to resuscitate the patient, to coordinate diagnostics and specialized care (trauma surgery, etc.) and, when indicated, to prepare the patient for transfer to definitive care.

In summary, the emergency department is integral in facilitating communication from the pre-hospital setting through to in-hospital trauma services. The emergency department coordinates rapid access to personnel and resources (trauma team, blood bank, diagnostic imaging, operating room, interventional radiology, etc.) and when indicated, organizes transport of the injured patient to a higher level of care.

Quaternary Trauma Services

Low incidence, high acuity injuries such as burns, spinal cord injury and specialized rehabilitation services should be cohorted in specialized centres to ensure case volume necessary to support competencies, expertise, and justify the dedication of specialized resources (quaternary care). Larger more populous provinces may have one or more of these specialized units. Smaller provinces will have only one or have bilateral agreements with other provinces to provide this specialized care. Quaternary services are generally located in Level I/II trauma centres, though they may not be and rehabilitation centres are often off site. The siting of these quaternary services is determined by the provincial lead agency.

Burn Services/Programs

The care of the burn injured patient can be complex and involves not only acute care management but also long term follow up for physical scar management and psychological support. While it is recognized that smaller burns can be and are managed at local centres, larger burns will benefit from transfer to dedicated regional burn units/centres with trained burn care professionals who are familiar with the latest advances in burn care, and experienced in caring for the complex burn patient. These centres by virtue of training and volume will be able to provide patients with the adjuncts to burn care and demonstrate improved burn care and outcomes.

Adjuncts to the care of the burn patient include: management of inhalation injury; infection control; expedient operative management, including blood conserving strategies; use of skin substitutes (such as Integra™ artificial dermis, or allograft); and scar management (silicone, pressure garments). These adjuncts can improve patient mortality, sepsis, and functional outcomes and should be considered standard components of a regional burn unit's armamentarium. In addition to the basic care of the burn injured patient, it should be expected that regional burn units as leaders in burn care will be active in collecting and maintaining information on burn care not only at their institution but also the region. This information should be reported on a regular basis and be used to inform outreach programs such as education and prevention.

The care of burn patients is based on a multidisciplinary approach and benefits from a clearly identified burn team. The American Burn Association recognizes the importance of this group enough so that it is required that weekly multidisciplinary team meetings be held as part of their verification requirements.

Given the documented profound and prolonged nature of psychological consequences from burn injury it is expected that the care of the burn patient extend to and include post discharge support for burn survivor programs with professional input into these programs from physiotherapy/occupational therapy/psychology/psychiatry.

Leadership of the burn program should recognize the complex nature of burn care, the need to stay abreast of the rapidly growing research and technology in burn care and the large team needed for patients' care. It is recommended that the medical director of the burn program be formally trained in burn care.

Spinal Cord Injury Services/Programs

Spinal cord injuries are an uncommon but devastating injury requiring an array of critical care, acute care and rehabilitation services. Patient outcomes and system optimization are enhanced by cohorting these patients in specialized centres with the required expertise and resources. Not all Level I/II Trauma Centres will, therefore, have spinal cord injury programs. Participation in provincial and national spinal cord injury registry as well as the trauma registry is expected.

Complex Subspecialty Trauma

In addition to burns and spinal cord injury, there are several subspecialty conditions that benefit from being consolidated in a few sites where expertise and competency can be maintained. Examples of these quaternary type injuries include: reimplantation surgery, major craniofacial injury, complex orthopedic trauma especially pelvic/acetabular fractures and complex hepatopancreaticobiliary trauma.

Rehabilitation

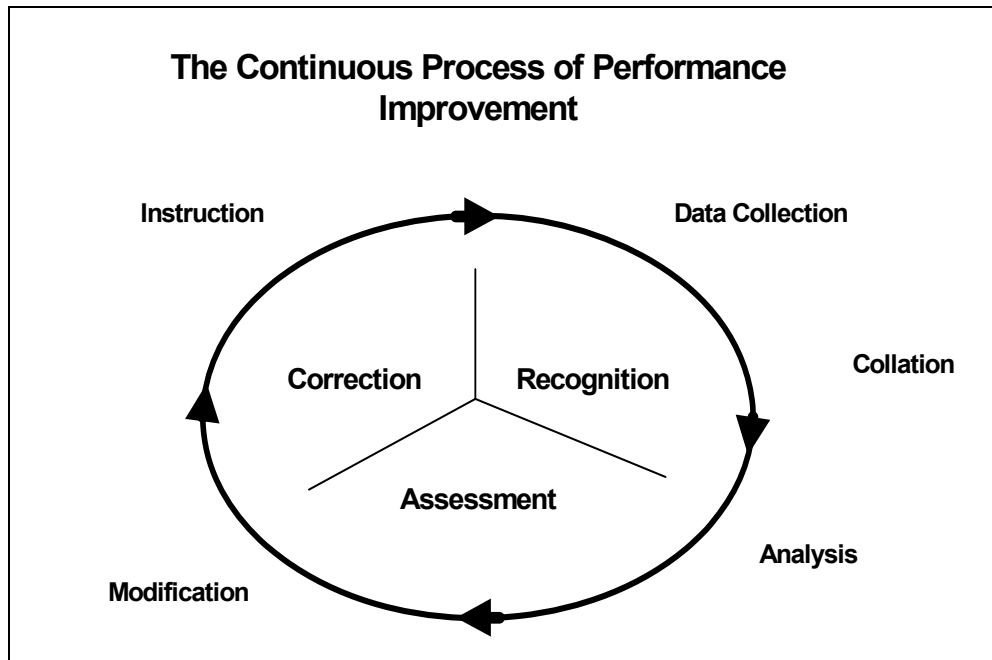
Patients surviving the acute phase of injury often have considerable residual physical and/or psychological disabilities. To a large extent this disability often goes unmeasured, unrecognized and poorly addressed. Appropriate screening for functional disabilities with access to physical rehabilitation programs and community psychological support remains a challenge nation-wide. It is clear that this important facet of care along the continuum deserves close attention and greater resource commitments to ensure patients achieve the best possible functional and psychological outcomes following injury. This will ultimately ensure a timelier and complete reintegration into society and return to the workforce.

Performance Improvement and Patient Safety (PIPS)

Performance Improvement is a structured process of continuous monitoring, measuring, evaluating, and improving the performance of a trauma program, system, and its providers through organized reviews of process of care and patient outcomes. A trauma care system should be responsible for monitoring its own performance and the performance of the subcomponents within the system. All processes should employ a multidisciplinary approach with the focus on opportunities for improvement rather than that of a punitive nature.

Performance Improvement and Patient Safety cannot be separated within the process of any care. Linking the environment in which our processes take place and the care itself is a natural fit, as they both overlap and blend with each other. PIPS programs are an essential and mandated requirement for all Canadian trauma systems accreditation. The PIPS program should be lead by trauma program leaders; a trauma medical director and a trauma program manager/trauma coordinator whose responsibility is the quality of trauma services provided by the centre and/or system.

Figure 3. Components of a Performance Improvement and Patient Safety (PIPS) program (Reproduced with permission: *Resources for Optimal Care of the Injured Patient*, Committee on Trauma, American College of Surgeons, Chicago, 2006)



Injury Surveillance and Injury Reporting

A mature trauma system requires robust data support including access to hospital admissions data for injury (minimal data set or MDS), coroner's data on trauma deaths (death data set or DDS), trauma registry data from participating trauma centres (comprehensive data set or CDS) and, where available, data on ambulatory trauma (ambulatory data set or ADS, e.g. NACRS or some equivalent with "injury" capabilities). Additional data sources such as motor vehicle collision data from insurance agencies and occupational injury from workers compensation boards, etc. may also be of value. Regular review of injury data from all sources is required to develop a comprehensive assessment of injury within the systems jurisdiction and to assess the impact of prevention initiatives. Annual and public reporting on injury, injury rates and injury death rates within health regions and provinces should be an expectation along with a report card of injury control initiatives and costs.

Injury Prevention

Injury prevention in most Canadian jurisdictions is a multi-agency effort encompassing various branches of government (health, labor, solicitor general, motor vehicle, highways, education, etc.), non-governmental agencies, and the health care sector. It is important to develop a coordinated approach to injury prevention at the provincial or regional level and integrate it fully into the trauma system as part of the public health approach to injury. Prevention programs based on emerging or persistent injury trends identified by the surveillance program can then be targeted, advocated for, and coordinated. Because of the dominant effect of alcohol and substance abuse on injury risk, all Level I and II Trauma Centres should be screening for problem drinking and substance abuse and offer a brief intervention thereof. It is important that appropriate interventions are available to minimize recidivistic high-risk behavior.

Research, Education and Training

Human resource requirements for the provision of trauma care are considerable and require constant renewal of well-trained committed health care providers. Critical to the system is the development of sustainable training programs for physicians, nurses, allied health and administration. This will include, but not be limited to, the provision of undergraduate and postgraduate medical and nursing programs as well as defined outreach courses such as ATLS® and DSTC® for doctors and TNCC™, ENPC™ or equivalent for nurses.

The generation of new knowledge through active trauma research programs is essential to gain a better understanding of the value of trauma systems, the key criteria needed to ensure optimal patient outcomes, and the epidemiology and pathophysiology of injury. The trauma system must be fully committed to this effort and appropriately resourced to do so. While the University affiliated trauma programs will primarily lead this effort, it is essential the whole system be involved in this activity. Commitment to injury related research is a defining criterion for Level I adult and pediatric trauma centres and as such must be fully supported by the institution and health professionals.

Emergency Preparedness

Emergency Preparedness is a key component of trauma systems and a demonstration of a province/region's commitment to a comprehensive response to natural or human-made disasters. The planning, exercising and education necessary to achieve a state of readiness for disasters and emergencies is paramount in today's society in order to meet the challenge of disasters.

The threat of natural or human-made disasters is an ever-present reality in many Canadian jurisdictions. An all hazards approach to emergency preparedness and emergency management is now advocated and should be fully integrated with the trauma system with mutual aid agreements between neighboring systems and provinces. The trauma system's infrastructure, communications capability, existing coordination of multiple agencies and its ability to respond rapidly, places it in an advantageous and responsible position to respond to disasters and to other major medical events.

Section III

LEVELS OF TRAUMA CENTRES

Trauma centres are a crucial component of the trauma system providing acute care services to the most seriously injured. In the inclusive vision of a trauma system, however, the care of all injured patients is important and essentially all acute care facilities have a role to play in the system. Indeed, the larger trauma centres could not function without the support of the many other institutions, which may be involved in the initial stabilization of major trauma and additionally care for a large volume of less severe injury. The role of these other institutions and their integration into the trauma system is critical to the success of the trauma system as a whole. Specialized pediatric trauma services are required in parallel with adult services to ensure the optimal care of pediatric trauma patients.

Geography has a significant bearing on trauma care in Canada and the resources available in rural and remote areas differ greatly from those available in more urban communities. The trauma system components and specifically the type of trauma services available will necessarily vary between communities. The goal of the system is to optimize trauma care given available resources and move patients expeditiously to the required level of care as required.

Trauma Centre Level Designation and Trauma System Configuration

The Trauma Association of Canada (TAC) now recognizes five levels of trauma facilities and an additional two levels of specialized pediatric trauma centre that acknowledge the differing roles acute care institutions will play within the trauma system while also addressing the geographical realities of providing trauma care in Canada. These trauma centre level designations are similar to those developed in other jurisdictions (Australia and the US) and are now numerically identified for simplicity and consistency. While the lower number designations indicate those hospitals with a primary role in providing care for major trauma along with the required greater resource capability, there is no intention to imply that the higher number designations are any less important to the system and to trauma outcomes.

The following descriptions define the institutional roles, services and resources that the Trauma Association of Canada has identified as being required for optimal trauma care in different environments. It is the responsibility of the system lead agency (Ministries of Health and/or Regional Health Authorities) to define the configuration of trauma facilities that will be required within their own jurisdictions to provide optimal and sustainable care of the injured. This process of designation of trauma centres is based on system need and trauma caseload. It is critical that the trauma system is appropriately configured with an appropriate number of major trauma centre(s) ensuring an adequate caseload and patient outcomes. TAC has no formal role in this designation process but will assess of the appropriateness of the trauma system's configuration during the accreditation process.

In general, only one Level I or Level II Trauma Centre and one Level I or Level II Pediatric Trauma Centre (free-standing or contained within the adult trauma centre) will be required in a trauma system serving a population of 1 to 2 million with an anticipated caseload in the order of 500 to 1000 major trauma cases. These centres are expected to provide definitive care to the majority of major trauma (defined as ISS>12) caseload in the system.

Level III Trauma Centres will be required in jurisdictions where there is no rapid access to Level I or II Centres but where there is a significant volume of major trauma. In general these Level III Centres will serve smaller urban or rural communities and provide a spectrum of trauma care depending on capabilities. It is expected that the more severely injured will be subsequently transferred to the lead centre (Level I or II) within the regional trauma system. It is unlikely that Level III Trauma Centres will be required in metropolitan areas with access to Level I/II Trauma Centres.

Level IV facilities typically exist in urban jurisdictions in close proximity to a Level I or II Trauma Centre. System field triage guidelines should be in place to ensure that the majority of major trauma patients bypass these facilities and are delivered to the Level I/II centre. However, a large volume of moderate (e.g. low energy mechanisms, single system) trauma care may be provided at these Level IV facilities. Level V Centres are those smaller community hospitals that may play a role in the initial stabilization of a major trauma patient (i.e. airway management) in the context of an appropriate trauma destination policy and protocol and with clear system capabilities and response for rapid critical care transport as needed to a higher level of care.

LEVEL I TRAUMA CENTRE

Role

Level I Trauma Centres are distinguished by providing;

- A leadership role in the provincial trauma system,
- A central role in the regional trauma system,
- Majority of tertiary, major trauma care in the system,
- Complex and unique (quaternary) trauma services for the province,
- Academic leadership including trauma training and research programs.

Resources

The Level I Trauma Centre is usually a University-affiliated, large metropolitan medical centre with a full array of medical specialties and ready access to advanced medical technology. Both Adult and Pediatric Level I Trauma Centres are required in the system with slightly differing criteria. Medical staff and hospital resources are dedicated and/or prioritized to the care of the major trauma patient ensuring rapid access to required care in a preplanned intramural system of care. In regional systems lacking dedicated Pediatric Level I or II Trauma Centres, the Adult Level I Trauma Centre will be required to provide pediatric trauma expertise. Resources and commitment should at a minimum fulfill the criteria for Level II Pediatric Centres (see further section thereof). Medical directorship should be assumed by a certified and appropriately remunerated surgeon, emergentologist or intensivist with special interest in pediatric trauma care. A co-leadership role will be shared with a designated Trauma Coordinator/Manager.

Trauma System Involvement

A Level I Trauma Centre must play a leadership role in the development and audit of the regional (+/- provincial) trauma system. It is critical in providing outreach educational and clinical support to the other trauma facilities in the system. It has a liaison role with other trauma system components (pre-hospital services and rehabilitation services) as well as emergency preparedness. Trauma centre leaders should chair or have a primary role in a Regional Trauma System Advisory Committee and also have a primary role in the Provincial Trauma System Advisory Committee.

Clinical Services

Level I Trauma Centres provide the majority of major trauma care (tertiary trauma caseload) in the system and may also draw specialized trauma cases from other adjacent regions within the province (quaternary trauma caseload) in need of services uniquely provided by the Level I Centre. All major surgical subspecialties should be available onsite and ideally the low volume quaternary programs such as burn centre and spinal cord injury centre would also be co-located at this centre. The high volume of major, multisystem trauma mandates a multidisciplinary clinical trauma service staffed by fellowship trained trauma surgeons and justify the development of dedicated trauma units for the care of the most seriously injured with appropriate monitoring and high acuity capabilities. Patients requiring critical care should be admitted to a closed ICU with 24 hr intensivist coverage and co-managed with the trauma team. It is an expectation that timely bedside consultation is required of all surgical subspecialties on

an as needed basis (usually within 30 minutes) and even more rapidly for Trauma Team Leaders and General Surgeons (20 minutes). Pediatric trauma services may be provided at the Level I Trauma Centre or at a dedicated Pediatric Trauma Centre (Level I/II).

Caseload

It is recommended that the number of major trauma centres (Level I – III) be limited in any jurisdiction consolidating major trauma to one or possibly two centres ensuring adequate case volumes. Consolidated caseload and associated volume-performance relationships support improved patient outcomes, program sustainability, and minimize the duplication of expensive resources and services. Institutional caseload in adult centres of 650 or more major trauma patients/annum (ISS > 15 as defined in the study) has been associated with improved patient outcomes, system efficiency and sustainability (Nathans, JAMA, 2001). Individual physician major trauma caseload experience should be adequate to maintain competency and not diluted by inappropriately large call panels. In addition to tertiary and quaternary care, it is anticipated that the Level I Centre will also provide a moderately large volume of secondary trauma care which is essential to justify the dedicated trauma resources, ensure maintenance of competency for trauma specialist and ensure adequate case volume for training and research programs.

Performance Improvement and Patient Safety (PIPS)

A rigorous PIPS program is a requirement for Level I Centres and should encompass trauma care across the entire regional system. Demonstration of progress in PIPS is required as evidenced by improved process, associated improved patient outcomes and system efficiencies. The PIPS program should be lead by funded trauma program leaders, a trauma medical director and a trauma program manager whose responsibility is the quality of trauma services provided by the centre and region. Participation in the regional, provincial and national trauma registry and annual reporting of activity and performance are expectations.

Injury Prevention

It is expected that Level I Trauma Centres will be actively engaged in injury prevention programs of their own and/or developing liaison with regional and provincial injury prevention leaders and coalitions. Specifically, there should be an alcohol-screening program in place and access to appropriate evidenced-based intervention.

Academic Programs

A defining role for Level I Centres is the provision of trauma training programs. In University centres this will include the usual undergraduate (medical student) and post graduate (resident) trauma training and may include fellowship programs in trauma, orthopedic trauma, burns/plastics, and neurotrauma and spine surgery. Trauma fellowship programs in non accredited trauma programs are not recognized by TAC. In addition, these centres are required to provide multidisciplinary outreach training programs for physicians, nurses and allied health professionals. These programs should include but not be limited to Advanced Life Support Course (ATLS)[®] for physicians, Trauma Nurse Core Course (TNCC)[®] and either ATOM[®] or DSTC[®] for community surgeons. Intramural academic rounds are a requirement with the capability to disseminate these to other sites involved in trauma care in the region/province.

LEVEL II TRAUMA CENTRE

Role

A Level II Trauma Centre is required in jurisdictions without a Level I Centre or where the major trauma caseload is too large for a single Level I Centre to deal with and therefore justifies two major trauma centres. A Level II Trauma Centre may have a central role in the regional trauma system or be supportive to the Level I Centre. In jurisdictions lacking Level I facilities, the Level II Centre is responsible for the care of the most seriously injured in the system and is expected to provide trauma training and outreach programs. Level II Centres may be the primary provider of regional pediatric trauma services supported by a Provincial or Regional Level I Pediatric Trauma Centre.

Resources

Level II Centres are usually large; community based medical centres with a comprehensive array of medical specialties and services, and ready access to advanced medical technology. They may or may not be University affiliated. Medical staff and hospital resources are dedicated and/or prioritized to the care of the major trauma patient ensuring rapid access to required care in a preplanned intramural system of care. The high volume of major trauma would generally support the development of a multidisciplinary clinical trauma service staffed by fellowship trained trauma surgeons and justify the development of dedicated trauma units for the care of the most seriously injured with appropriate monitoring and high acuity capabilities. In regional systems lacking dedicated Pediatric Level I or II Trauma Centres, the Adult Level II Trauma Centre will be required to provide pediatric trauma expertise. Resources and commitment should at a minimum fulfill the criteria for Level II Pediatric Centres. Medical directorship should be assumed by a certified and appropriately remunerated surgeon, emergentologist or intensivist with special interest in pediatric trauma care. A co-leadership role will be shared with a designated Trauma Coordinator/Manager.

Trauma System Involvement

A Level II Trauma Centre may be required to play a leadership role in the development and audit of the regional trauma system especially in systems without a Level I Centre. It is important in providing outreach educational and clinical support to the other trauma facilities in the system. It has a liaison role with other trauma system components (pre-hospital services and rehabilitation services). Trauma Centre leaders should chair or have a primary role in a Regional Trauma System Advisory Committee and be represented on the Provincial Trauma Advisory Committee.

Clinical Services

Level II Centres may provide the majority of major trauma care (tertiary trauma caseload) in the system if a Level I Centre is not present. All major surgical subspecialties should be available onsite. The high volume of major trauma would generally support the development of a clinical trauma service led by fellowship trained trauma surgeons and justify the development of dedicated trauma units with high acuity monitoring capability for the care of the most seriously injured. Patients requiring critical

care should be admitted to a closed ICU with 24 hr intensivist coverage and co-managed with the trauma team. It is an expectation that timely bedside consultation is required of all surgical subspecialties on an as needed basis (usually within 30 minutes) and even more rapidly for Trauma Team Leaders and General Surgeons (20 minutes). Pediatric as well as adult trauma services may be provided at these centres in which case they must meet additional criteria to ensure optimal management of this patient population. Quaternary trauma cases e.g. burns, spinal cord injury, cardiac, endovascular, complex orthopedic/hepatobiliary trauma) may be transferred to the nearest Level I Centre.

Caseload

It is recommended that the number of major trauma centres (Level I – III) be limited in any jurisdiction to ensure that major trauma is consolidated at a few sites providing for adequate case volumes to support improved patient outcomes (volume-performance relationship), program sustainability, and to minimize the duplication of expensive resources and services. Institutional caseload of Level II Centres should strive to approximate those recommended for Level I Centres. Equally important is the individual physician major trauma caseload experience, which should be adequate to maintain competency and not diluted by inappropriately large call panels. In addition to tertiary care (major trauma caseload), it is anticipated that the Level II Centre will also provide a moderately large volume of secondary trauma care. This additional caseload will usually bring the total trauma admissions to over 1500 cases and is essential to justify the dedicated trauma resources, ensure maintenance of competency for trauma specialists and ensure adequate clinical material for training and research programs.

Performance Improvement and Patient Safety (PIPS)

A rigorous PIPS program is a requirement for Level II Centres and should encompass trauma care across the entire regional system consistent with provincial and Level I Centre programs. Demonstration of progress in PIPS is required as evidenced by improved process, associated improved patient outcomes and system efficiencies. The PIPS program should be lead by funded trauma program leaders, a trauma medical director and a trauma program manager, whose responsibility is the quality of trauma services provided by the centre and potentially the region. Participation in the regional and provincial trauma registry and annual reporting of activity and performance are expectations.

Injury Prevention

It is expected that Level II Trauma Centres will be actively engaged in injury prevention programs of their own and/or developing liaison with regional and provincial injury prevention leaders and coalitions. Specifically, there should be an alcohol-screening program in place and access to appropriate evidenced-based intervention.

Academic Programs

An optional supporting role for Level II Centres is the provision of trauma training programs. In University centres this will include undergraduate (medical student) and postgraduate (resident) trauma training. In addition, these centres are required to provide multidisciplinary outreach training programs for physicians, nurses and allied health professionals. These programs should include but not be limited to Advanced Trauma Life Support® course for physicians and Trauma Nurse Core Course®. Intramural academic rounds are a requirement with the capability to disseminate these to other sites involved in trauma care in the region.

LEVEL III TRAUMA CENTRE

Role

A Level III Trauma Centre is required in jurisdictions without timely access to Level I or Level II Centres and typically exist in smaller urban or rural communities. A Level III Trauma Centre may have a central role in providing trauma care in the local community and region and is a crucial component of regional trauma system for both adult and pediatric trauma. Level III Centres will often receive a moderate to large caseload of major and moderate trauma but are expected to secondarily transfer the majority of the major trauma caseload requiring the more complex services provided by Level I and II Centres. Transfer agreements and policies should be in place to facilitate and expedite this process.

Resources

Level III Centres may be large or relatively smaller, community-based medical centre with a variable array of medical specialties and medical technology. They are not usually University affiliated. Available medical and hospital resources should be prioritized to the care of the major trauma patient ensuring rapid access to required care in a preplanned intramural system of care.

Trauma System Involvement

A Level III Trauma Centre plays an important supportive role in the regional trauma system. It has an important function in the early stabilization of major trauma in jurisdictions without Level I/II Centres and the provision of secondary level trauma services. Trauma centre leaders should have a role in a Regional Trauma System Advisory Committee.

Clinical Services

Level III Centres will be required to provide initial care to major trauma patients in their jurisdiction and definitive care to all secondary level single system trauma cases. The ability to deal with specific injuries will depend on available surgical subspecialties and services. In general, more complex or multisystem trauma cases (ISS > 15) or those requiring intense resource commitments will be transferred to Level I or Level II Centres. Stabilization of major trauma patients prior to transfer including, if necessary operative stabilization, is an important function of Level III Centres. It is an expectation that timely bedside consultation is required of all available surgical subspecialties on an as needed basis (usually within 30 minutes) and even more rapidly for Trauma Team Leaders and General Surgeons (20 minutes). Single system trauma patients should be generally admitted to the appropriate surgical specialty irrespective of whether operative or non-operative management is planned. Poly trauma (multisystem injury) patients should in general be transferred to the Level I/II Centre or otherwise managed by the most appropriate surgical service, usually general surgery. Since this multitrauma case volume is expected to be low, a dedicated trauma service is not a requirement. Admitted trauma patients should ideally be cohorted to one area of the hospital and have access to monitoring/high acuity services as required by regional guidelines or transferred out. Trauma patients requiring ICU support should in general be transferred

to the Level I/II trauma centres, while those admitted to the Level III trauma centre ICU require co-management by surgeon and intensivist (if required).

Caseload

It is anticipated that Level III Centres will have a limited responsibility for the definitive care of major trauma (tertiary caseload) and this should be reflected in a small caseload of admitted patients with ISS > 15. These centres, depending on the size of the community they serve, may be responsible for the care of a large secondary trauma caseload.

Performance Improvement and Patient Safety (PIPS)

Level III Centres should participate fully in the system's PIPS program. Demonstration of progress in PIPS is required as evidenced by improved process, associated improved patient outcomes and system efficiencies. The PIPS program should be lead by funded trauma program leaders, a trauma medical director and a trauma program manager/trauma coordinator, whose responsibility is the quality of trauma services provided by the centre and potentially the region. Participation in the regional and provincial trauma registry is an expectation. Outcomes for major trauma patients managed in the Level III Centre should be equivalent to those in the systems Level I/II Centre.

Injury Prevention

It is expected that Level III Trauma Centres will participate in injury prevention programs within the regional and local community.

Academic Programs

Level III Centres have a limited role in provision of trauma training programs but should ensure that its staff has access to ATLS® and TNCC® at a minimum and participate in the regions academic rounds.

LEVEL IV HOSPITAL

Role

A Level IV Hospital exists in an urban setting with a nearby major trauma centre (Level I or II Centre (30 minutes away). Field triage protocols are in place diverting major trauma cases to the Major Trauma Centre (Level I/II) and bypassing the Level IV Hospital. The Level IV Hospital receives and provides definitive care for a potentially high volume of secondary level trauma caseload from within the system. Any major trauma cases presenting to their emergency department are stabilized as necessary then rapidly transferred to the nearest appropriate Major Trauma Centre according to established transfer agreements and policies.

Resources

Level IV Hospitals may be large community based or University affiliated medical centres with a variable array of available medical specialties and medical technology. Available medical and hospital resources are not generally prioritized to the care of the major trauma patient although emergent resuscitative capability, surgical intervention and stabilization are required.

Trauma System Involvement

A Level IV Hospital plays a vital supportive role in the regional trauma system in the provision of large volume secondary level (non-major) trauma services and protecting the major trauma centres from inundation with this single system, lower acuity trauma caseload.

Clinical Services

Level IV Hospitals are required to provide definitive care to all secondary level trauma cases presenting to their institution providing the necessary surgical specialties and clinical services are present. The vast majority of this caseload will be single system musculoskeletal injury requiring orthopedic support. A significant proportion of this caseload is expected to be elderly frail and will need support from internal medicine, family practice and/or geriatric medicine. Appropriate access to rehabilitation and community services is a major requirement. Single system abdominal trauma may be managed on site if appropriate monitoring capability and surgical commitment is present for non-operative management of solid organ injury. It is an expectation that timely bedside consultation to the emergency department is required of all available surgical subspecialties on an as needed basis. A Trauma Team Leader program is considered non-essential, though may be desirable based on ED resources, trauma case volume and case mix at the hospital.

It is recognized that in the setting of a Level IV Hospital, pediatric tertiary level care is likely available in the near vicinity of the regional Level I Trauma Centre, and pre-hospital protocols should be established that permit bypass of the Level IV Hospital for pediatric patients in favor of Level I care. Despite this, the ability to perform primary resuscitation of pediatric patients that may arrive with little or no pre-hospital triaging must be integrated into the emergency department services.

Caseload

It is anticipated that Level IV Hospitals will have essentially no responsibility for the emergent and definitive care of major trauma, either adult or pediatric, and this should be reflected in a virtually nonexistent caseload of admitted patients with ISS > 15. These centres, depending on the size of the community they serve and their role in the system, may be responsible for the care of a large volume of secondary (non-major, ISS < 15) trauma caseload.

Performance Improvement and Patient Safety (PIPS)

Level IV Hospitals should participate fully in the hospital's PIPS programs and divisional M and M rounds. Demonstration of progress in PIPS is required as evidenced by improved process, associated improved patient outcomes and system efficiencies. Regional Trauma Leaders should ensure appropriate trauma case mix and outcomes at the Level IV Hospital through the regional PIPS program.

Injury Prevention

It is expected that Level IV Hospital will participate in injury prevention programs relevant to their trauma population and mandate within the system. As many communities face unique challenges and complex trauma injury prevention requires community development strategies to be successful. The lead trauma centres should recognize the unique needs and strategies, and should support the Level IV Centres to meet their IP needs within the system.

Academic Programs

Level IV Hospitals have a limited role in provision of trauma training programs but should ensure that its staff has access to appropriate training and outreach programs such as ATLS® and TNCC™.

LEVEL V FACILITY

Role

A Level V Facility exists in a rural setting with no immediate access to a major trauma centre (Level I – III Centre). The Level V Facility receives any adult or pediatric trauma patient within their catchment area only as per the regional trauma destination policy (i.e. if immediate advanced airway management is required). Most trauma cases will be rapidly transferred to the nearest appropriate trauma centre following stabilization or initially bypassing the Level V facility completely if appropriate (e.g. Rotor wing critical care transport).

Resources

Level V Facilities may be a small community hospital or a treatment centre. Available medical and facility resources are generally very limited but need to be prioritized to the care of the major trauma patient if required. Resuscitative emergency department capability, operative stabilization if capability exists and access to air evacuation is essential.

Trauma System Involvement

A Level V Facility plays a vital front line role in the regional trauma system in the provision of emergency services for the stabilization of trauma cases prior to transfer to the nearest appropriate trauma centre as indicated by a regional trauma destination policy/protocol.

Clinical Services

Level V Facilities may be required to provide some definitive care to secondary level trauma cases depending on available surgical specialties and clinical services. The vast majority of the trauma caseload, however, will be transferred to trauma centres following stabilization, which may include operative control of hemorrhage if that capability exists. It is an expectation that timely bedside consultation is required of any available surgical subspecialties on an as needed basis (usually within 30 minutes) and that there is a requirement for protocols to be in place for the management of major trauma and subsequent transfer.

Caseload

It is anticipated that Level V Facilities will have a very small admitted trauma caseload but may have to deal with the resuscitation, stabilization and transfer of a much higher case volume.

Performance Improvement and Patient Safety (PIPS)

Level V Facilities should participate fully in their regions PIPS programs and telehealth trauma rounds. Regional Trauma Leaders should ensure proper use of Level V Centres in the context of under triage with appropriate review.

Injury Prevention

It is recommended, but not an expectation of Level V Facilities to participate within injury prevention programs. Rural communities face unique challenges and complex trauma (e.g. farm injuries) and injury prevention requires community development strategies to be successful. The lead trauma centres should recognize the unique needs and strategies, and should support the Level V Facilities to meet their IP needs within the system.

Academic Programs

Level V Facilities have a limited role in provision of trauma training but should ensure that their staff has access to appropriate training and outreach programs such as ATLS® and TNCC™ as well as to regional trauma telehealth trauma education and other appropriate trauma education.

LEVEL I PEDIATRIC TRAUMA CENTRE

Role

Like its adult-patient counterpart, a Level I Pediatric Trauma Centre plays a central role in the regional and provincial trauma systems with respect to all aspects of pediatric trauma care, from injury prevention to acute care to rehabilitation. It takes into account the unique needs of the injured child and their families, including anatomic, physiologic and psychologic differences, maintaining a setting of family-centered care. It maintains academic leadership with respect to research and trauma training, both locally, outreach, and research. In many cases, it may serve as the lead for pediatric trauma care over the jurisdictions of more than one Level I or II Adult Centres. As such, its outreach role in education, advice/consultation, triage and clinical care is significant.

Resources

The Level I Pediatric Trauma Centre is a University-affiliated pediatric tertiary care facility with a full array of medical specialties and ready access to advanced medical technology. Structurally, it may be recognized as a freestanding children's hospital or a separate administrative entity within a larger general hospital (usually also a Level I Trauma Centre), otherwise known as a "children's hospital within a hospital". Medical staff and hospital resources are dedicated and/or prioritized to the care of the major pediatric trauma patient ensuring rapid access to required care in a preplanned system of care. Medical directorship should be assumed by a certified and appropriately remunerated pediatric surgeon, pediatric emergentologist or pediatric intensivist with special interest in pediatric trauma care. A co-leadership role will be shared with a designated Pediatric Trauma Coordinator/Manager.

Trauma System Involvement

A Level I Pediatric Trauma Centre must play a leadership role in the development and audit of the regional (+/- provincial) pediatric trauma system. It is critical in providing outreach educational and clinical support to the other trauma facilities in the system. It has a liaison role with other trauma system components both upstream (pre-hospital services, regional [Levels III, IV and V] trauma centres) and downstream (rehabilitation services) as well as emergency preparedness. This includes a close working relationship with the regional/provincial Adult Level I Trauma Centre, especially in discussions of care of the youth major trauma patient who falls at the cusp of the age limits for the pediatric centre. Pediatric trauma centre leaders should have a primary role in a Regional Trauma System Advisory Committee and also have a primary role in the Provincial Trauma System Advisory Committee.

Clinical Services

Pediatric Level I Trauma Centres provide the majority of major pediatric trauma care (tertiary trauma caseload) in the system. Larger and/or provincial-level centres may also draw specialized trauma cases from other adjacent regions within the province (quaternary trauma caseload) in need of services uniquely provided by that Level I Centre. All major pediatric surgical subspecialties should be available onsite and ideally the low volume quaternary programs such as pediatric burn care and acute brain injury/spinal cord injury rehabilitation programs would also be co-allocated at this centre.

The high volume of major trauma will generally support the presence of a multidisciplinary clinical trauma team and clinical program staffed by pediatric surgical specialists with an interest in trauma. This would include a dedicated trauma unit or surgical ward where pediatric patients are geographically located together in order to maintain clinical and nursing expertise in pediatric trauma management. Policies must be in place to ensure consistent and optimal care of these patients, including appropriate designation of most responsible surgeons. It is an expectation that timely bedside consultation is required of all surgical subspecialties on an as needed basis (usually within 30 minutes) and even more rapidly for Trauma Team Leaders and Pediatric General Surgeons (20 minutes).

Caseload

It is recommended that the number of Pediatric Level I Trauma Centres be limited in any one region, consolidating major pediatric trauma to ensure adequate case volumes. Consolidated caseload and associated volume-performance relationships support program sustainability, optimize maintenance of expertise, minimize the duplication of expensive resources and ensure oversight of pediatric trauma care within the system. It is recognized that overall caseloads may vary between centres due to differences in age definitions of “pediatric” and due to challenges imposed by geography, population and limited resources. Equally important is the individual physician major trauma caseload experience, which should be adequate to maintain competency and not diluted by inappropriately large call panels. In addition to tertiary and quaternary care, it is anticipated that the Pediatric Level I Centre will also provide a moderately large volume of non-major trauma care. As such, it is recommended that a Pediatric Level I Trauma Centre should admit at least 200 injured children younger than 16 years on an annual basis in order to justify the dedicated trauma resources to ensure maintenance of competency for trauma specialists and ensure adequate clinical material for training and research programs.

Performance Improvement and Patient Safety (PIPS)

A rigorous performance improvement program is a requirement for Pediatric Level I Centres and should encompass pediatric trauma care across the entire regional system. Demonstration of progress in PIPS evidenced by improved process, associated outcomes and system efficiencies. The PIPS program should be multidisciplinary, led by the pediatric trauma medical directors and trauma program manager/coordinator, and predicated on optimizing the quality of pediatric trauma services provided by the center and region. This program is dependent on high quality data management. Participation in the regional, provincial and national trauma registry is an expectation and annual reporting of activity and performance is an expectation.

Injury Prevention

It is expected that Pediatric Level I Trauma Centres will be actively engaged in childhood and youth injury prevention programs of their own as well as developing liaisons with regional and provincial injury prevention leaders and coalitions. They must demonstrate an advocacy role with regards to child and youth injury prevention policy development within their region.

Academic Programs

A defining role for Pediatric Level I Centres is the provision of pediatric trauma care training. In University centres this will include the usual undergraduate and postgraduate (resident and fellow) trauma training and may include specific pediatric trauma fellowship programs. In addition, these centres are required to provide multidisciplinary outreach training programs for physicians, nurses and allied health professionals. These programs should include but not be limited to Pediatric Advanced Life Support® for physicians, Advanced Pediatric Life Support®, Trauma Nurse Core Course® and the pediatric components of the Advanced Trauma Life Support (ATLS) courses. Intramural academic rounds are a requirement with the capability to disseminate these to other sites involved in pediatric trauma care.

LEVEL II PEDIATRIC TRAUMA CENTRE

Role

A Level II Pediatric Trauma Centre is required in jurisdictions lacking a Level I Pediatric Centre or where the major trauma caseload is too large for a single Level I Pediatric Centre to deal with and therefore justifies two centres capable of managing most major pediatric trauma. Like a Level I Centre, a Level II Pediatric Trauma Centre respects all aspects of pediatric trauma care, from injury prevention to acute care to rehabilitation. It takes into account the unique needs of the injured child and their families, including anatomic, physiologic and psychologic differences, maintaining a setting of family-centered care. A Level II Pediatric Trauma Centre may have a central role in the regional or provincial trauma system or be supportive to the regional/provincial Level I facility. In jurisdictions lacking Level I Pediatric Trauma facilities, the Level II Centre is responsible for the care of the most seriously injured children in the system and is expected to provide trauma training and outreach programs for the region.

Resources

A Level II Pediatric Trauma Centre will typically exist as a separate administrative entity within a larger general hospital (usually also a Level I or Level II Trauma Centre), otherwise known as a “children’s hospital within a hospital”, or as a comprehensive pediatric care unit within a general hospital organization. As such, it will typically have a comprehensive array of medical specialties and services dedicated to children, and ready access to advanced medical technology. It may or may not be University affiliated. Medical staff and hospital resources are dedicated and/or prioritized to the care of the major pediatric trauma patient ensuring rapid access to required care in a preplanned system of care. Medical directorship should be assumed by a certified and appropriately remunerated pediatric surgeon, pediatric emergentologist or pediatric intensivist with special interest in Pediatric Trauma Care. A co-leadership role will be shared with a Trauma Coordinator/Manager whose responsibilities may also cover adult trauma care.

Trauma System Involvement

A Level II Pediatric Trauma Centre may be required to play a leadership role in the development and audit of the regional pediatric trauma system. It is critical in providing outreach educational and clinical support to the other trauma facilities in the regional system. It has a liaison role with other trauma system components both upstream (pre-hospital services, regional [Levels III, IV and V] trauma centres) and downstream (rehabilitation services) as well as emergency preparedness. This includes a close working relationship with the regional Adult Level I and/or II Trauma Centre, especially in discussions of care of the youth major trauma patient who falls at the cusp of the age limits for the pediatric centre. Pediatric Trauma Centre leaders should have a primary role in a Regional Trauma System Advisory Committee and also have a primary role in the Provincial Trauma System Advisory Committee.

Clinical Services

A Level II Pediatric Trauma Centre may provide the majority of major pediatric trauma care (tertiary trauma caseload) in the system if a Level I Centre is lacking. All major surgical subspecialties should be available onsite. At a minimum, there should be at least one certified pediatric general surgeon or a general surgeon with special interest and certified training in the surgical care of children, who participates in ongoing continuing medical education in pediatric trauma care. There must be at least one orthopedic surgeon and one neurosurgeon with demonstrated interests and competences in the management of pediatric orthopedic and neurosurgical trauma, respectively. The emergency department and critical care unit must have designated areas of pediatric patients and must be staffed by individuals trained in and capable of providing pediatric care. The volume of major pediatric trauma would support the presence of a multidisciplinary clinical trauma team that may not necessarily be exclusive to, but should maintain some expertise in pediatric trauma care. This would include a dedicated trauma unit or surgical ward where pediatric patients are geographically located together in order to maintain clinical and nursing expertise in pediatric trauma management. Policies must be in place to ensure consistent and optimal care of these patients, including timely diagnostic imaging, emergent access to lab and blood component resources and appropriate designation of most responsible surgeons. It is an expectation that timely bedside consultation is required of all surgical subspecialties on an as needed basis (usually within 30 minutes) and even more rapidly for Trauma Team Leaders and Pediatric General Surgeons (20 minutes).

Caseload

It is recommended that the number of Pediatric Trauma Centres be limited in any one region, consolidating major pediatric trauma to ensure adequate case volumes. Consolidated caseload and associated volume-performance relationships support program sustainability, optimize maintenance of expertise, minimize the duplication of expensive resources and ensure oversight of pediatric trauma care within the system. It is recognized that overall caseloads may vary between centres due to differences in age definitions of “pediatric” and due to challenges imposed by geography, population and limited resources. Equally important is the individual physician major trauma caseload experience, which should be adequate to maintain competency and not diluted by inappropriately large call panels. In addition to tertiary care, it is anticipated that the Pediatric Level II Centre will also provide a moderately large volume of non-major trauma care. As such, it is recommended that a Pediatric Level II Trauma Centre should admit at least 100 injured children younger than 16 years on an annual basis in order to justify the dedicated trauma resources, ensure maintenance of competency for trauma specialist and ensure adequate clinical material for training and research programs.

Performance Improvement and Patient Safety (PIPS)

A rigorous performance improvement program is a requirement for Pediatric Level II Centres and should encompass pediatric trauma care across the entire regional system. Demonstration of progress in PIPS evidenced by improved process, associated outcomes and system efficiencies. The PIPS program should be multidisciplinary, led by the pediatric trauma medical director and trauma program manager/coordinator, and predicated on optimizing the quality of pediatric trauma services provided by the centre and region. This program is dependent on high quality data management. Participation in the regional, provincial and national trauma registry is an expectation and annual reporting of activity and performance is an expectation.

Injury Prevention

It is expected that Pediatric Level II Trauma Centres will be actively engaged in childhood and youth injury prevention programs of their own as well as developing liaisons with regional and provincial injury prevention leaders and coalitions. They must demonstrate an advocacy role with regards to child and youth injury prevention policy development within their region.

Academic Programs

An optional supporting role for Level II Pediatric Centres is the provision of trauma training programs. In University centres this will include the usual undergraduate and postgraduate (resident) trauma training. In addition, these centres are required to provide multidisciplinary outreach training programs for physicians, nurses and allied health professionals. These programs should include but not be limited to Pediatric Advanced Life Support® for physicians, Advanced Pediatric Life Support®, Trauma Nurse Core Course® and the pediatric components of the Advanced Trauma Life Support (ATLS) courses. Intramural academic rounds are a requirement with the capability to disseminate these to other sites involved in trauma care in the region.

ADULT TRAUMA CENTRES TREATING INJURED CHILDREN (ATCTC)

Role

It is recognized that due to resources, volume and geography, adult trauma facilities play a significant role in the management of all degrees of pediatric trauma, from initial resuscitation, stabilization and transfer of major trauma to pediatric tertiary care, to management of more minor injuries, with referrals as needed. In general, this would apply to Adult Level II, III and V Trauma Facilities as described above. Large variations in geography, trauma volume and resources do not permit distinct descriptions for varying levels of pediatric care at these centres. A strong working relationship must be established with the regional/provincial Level I/II Pediatric Trauma Centre to determine case definitions of what should be transferred to tertiary level care and what can remain at the district level.

Resources

All Adult Centres receiving any trauma must be equipped with basic equipment required for the resuscitation of the injured child. This includes airway management and venous access, including intraosseous access capabilities. For facilities that annually admit 100 or more injured children under the age of 15 years, emergency medicine, general surgery, other surgical subspecialties and critical care must demonstrate specialized interest and care in the management of injured children. There must be a designated area in the emergency department for pediatric resuscitation and capability for pediatric critical care.

Transfer agreements, policies and transport protocols are required to expedite transfer to the Pediatric Trauma Centre (Level I/II).

Section IV CRITERIA FOR PROVINCIAL AND REGIONAL TRAUMA SYSTEMS

Preamble

The criteria within this section of the document represent individual components of each trauma centre site and the system, it must be recognized that meeting individual components does not replace meeting the major concepts and requirements of a regional trauma system as outlined in previous sections of this document.

E=Essential, D=Desirable, N=Not Essential

A. Provincial Trauma System	
• Lead Agency for Provincial Trauma Services with responsibility for system development, configuration, resourcing, performance and reporting	E
• Provincial Medical Director, Trauma Services	E
• Provincial Executive Director, Trauma Services	E
• Provincial Trauma Advisory Committee	E
• Injury Surveillance (discharge abstract database, Coroner/Medical Examiner database, and provincial trauma registry)	E
• Injury Reporting (regular reporting of injury data)	E
• Injury Prevention Programs and Coordination	E
• Demonstrated Public Accountability (website, annual report)	E
• Funding Model/Structure for Trauma Programs and Trauma Services	E
• Provincial Emergency Preparedness Office and mass casualty plan	E
• Province-wide Integrated Pre-Hospital Services	E
• Province-wide Integrated Adult/Pediatric Trauma Services	E
• Provincial Plan for Specialized and Quaternary Trauma Care (i.e. Pediatric Trauma, Burns, Spinal Cord Injury)	E
• Provincial rehabilitation services for trauma	E
• Province wide trauma performance improvement and patient safety (PIPS) program including Standardized Practice Guidelines for Trauma Care	E
• Provincial Performance Assessment and Reporting of Trauma Services	E
• Access to appropriate trauma training programs, education and outreach	E
• Support trauma related research	E
• Inter-provincial/Territory Agreements	E

B. Provincial and Quaternary Trauma Services

Burn Care

<ul style="list-style-type: none"> • Integration with Trauma registry with capture of all burn admissions with burn specific outcomes 	E
<ul style="list-style-type: none"> • Dedicated multidisciplinary burn team with regular meetings 	E
<ul style="list-style-type: none"> • Regular education outreach programs 	E
<ul style="list-style-type: none"> • Protocols for immediate treatment and transfer of major burn patients including repatriation 	E
<ul style="list-style-type: none"> • Access to Dermal substitutes and expertise in their use 	E
<ul style="list-style-type: none"> • Protocols for immediate treatment and transfer of major burn patients and repatriation 	E
<ul style="list-style-type: none"> • Access to operative resources in a timely manner 	E
<ul style="list-style-type: none"> • Burn survivors programs (adult and pediatric) 	E

Spinal Cord Injury

<ul style="list-style-type: none"> • Provincial spinal cord injury program and plan 	E
<ul style="list-style-type: none"> • Protocols for immediate treatment and transfer of spinal cord injury patients 	E
<ul style="list-style-type: none"> • Access to spinal cord injury centre if not on site 	E
<ul style="list-style-type: none"> • Protocols for immediate treatment and transfer of spinal cord injury patients 	E

Complex Subspecialty Surgical Services

<ul style="list-style-type: none"> • Access to complex periarticular, acetabular and pelvic fracture repair expertise 	E
<ul style="list-style-type: none"> • Access to expertise in reimplantation and complex soft tissue coverage 	E
<ul style="list-style-type: none"> • Access to endovascular services 	E
<ul style="list-style-type: none"> • Access to complex pancreatco-hepatobiliary trauma services 	E

Provincial Rehabilitation Services

<ul style="list-style-type: none"> • Multidisciplinary dedicated rehabilitation team 	E
<ul style="list-style-type: none"> • Rapid expedient consultation with Physiatrist for major trauma patients 	E
<ul style="list-style-type: none"> • Traumatic brain injury (TBI) rehab program integrated with inpatient services and continuing to outpatient services 	E
<ul style="list-style-type: none"> • TBI consultation available for all patients in the region 	E
<ul style="list-style-type: none"> • Rehabilitation programs for burns, head injury, amputation (prosthetic fitting), pediatric, geriatric, spinal cord injury 	E
<ul style="list-style-type: none"> • Integration of rehabilitation with assessment of outcomes e.g. FIM, SF-36, PTSD, alcohol use 	E
<ul style="list-style-type: none"> • Dedicated provincial inpatient beds for multisystem trauma patients 	E

C. Regional Trauma System	
• Lead Agency for Regional Trauma Services responsible for system development, configuration, site designation, resourcing and evaluation	E
• Regional Medical Director, Trauma Services	E
• Regional Trauma Manager, Trauma Services	E
• Regional Trauma Advisory Committee	E
• Injury Surveillance (Hospital database, Coroner database, and Registry)	E
• Injury Reporting (regular reporting of injury data)	E
• Injury Prevention Programs and Coordination	E
• Demonstrated Public Accountability (Website, annual reports)	E
• Funding Model/Structure for Trauma Services	E
• Regional Emergency Preparedness Office and mass casualty plan	E
• Region-wide Integrated Pre-Hospital Services	E
• Region-wide Integrated Adult/Pediatric Trauma Services	E
• Regional Rehabilitation services	E
• Regional system performance improvement and patient safety (PIPS) program including Standardized Practice Guidelines for Trauma Care	E
• Access to appropriate trauma training programs and education	E
• Support trauma related research	E
• Inter-regional Support and Repatriation Agreements	E

Section V CRITERIA FOR PROVINCIAL AND REGIONAL EMERGENCY MEDICAL SERVICES

E=Essential, D=Desirable, N=Not Essential

A. EMS Care, Communication and Transport	
<ul style="list-style-type: none"> • Service Coverage <ul style="list-style-type: none"> ➤ Province-wide or region-wide, integrated EMS/pre-hospital services (communications, land/ground and aero-medical) 	E
<ul style="list-style-type: none"> • Access <ul style="list-style-type: none"> ➤ Universal access to EMS through 911/911e or equivalent system 	E
<ul style="list-style-type: none"> • Communications/Dispatch <ul style="list-style-type: none"> ➤ Centralized communication system enabling prompt dispatch of appropriate land and/or aero medical pre-hospital response 	E
<ul style="list-style-type: none"> • Protocols to define appropriate pre-hospital response based on patient acuity, geography and available resources 	E
<ul style="list-style-type: none"> ➤ Triage 	E
<ul style="list-style-type: none"> ➤ Authority/approval to bypass local hospitals for major trauma patient 	E
<ul style="list-style-type: none"> ➤ Criteria established for pre-hospital personnel to identify severely injured patients in the field 	E
<ul style="list-style-type: none"> ➤ Protocols established for the transport of severely injured patients directly to appropriate level of trauma centre 	E
<ul style="list-style-type: none"> ➤ Effective real time communication system with receiving trauma centre or equivalent on-line medical oversight 	E
<ul style="list-style-type: none"> ➤ Definition of geographic limits within which the protocols and criteria are to be applied for the trauma patient 	E
<ul style="list-style-type: none"> • Treatment Protocols <ul style="list-style-type: none"> ➤ Protocols for the treatment of trauma patients 	E
<ul style="list-style-type: none"> • Quality Assurance <ul style="list-style-type: none"> ➤ Trauma care training program with tertiary trauma centre participation 	E
<ul style="list-style-type: none"> • Quality management program to evaluate efficacy of triage criteria and protocols, process of care outcomes for EMS 	E
<ul style="list-style-type: none"> • Formal Liaisons With <ul style="list-style-type: none"> ➤ Tertiary/Regional Trauma Program and pre-hospital care system (i.e. shared membership on advisory board, etc.) 	E
<ul style="list-style-type: none"> • Emergency Preparedness Planning group(s) with linkages to trauma programs 	E
<ul style="list-style-type: none"> • Regular quality review of pre-hospital records as they apply to interfacility transport 	E
<ul style="list-style-type: none"> • System to ensure availability of pre-hospital care records to tertiary trauma centre staff and to trauma registry 	E
<ul style="list-style-type: none"> • Record linkage identifier on pre-hospital care records to allow linkage to in-hospital records and other data sources in the trauma registry. 	E

B. Inter-Facility Communication and Transport	
• Formal liaison between tertiary trauma centre and regional/provincial critical care transport program	E
• Guidelines for defining responsibilities and composition of transport teams of accompanying personnel	E
• Established Transfer Guidelines Protocol with guaranteed access to tertiary trauma centre for the major trauma patient	E
• Quality Assurance Process linked with Trauma Program	E
• Appropriate training for accompanying personnel specifically relating to the inter-hospital transport of trauma patients	E
• Regular quality review of pre-hospital care records	E
• System to ensure availability of pre-hospital care records to tertiary trauma centre staff and to trauma registry	E
• Record linkage identifier on pre-hospital care records to allow linkage to in-hospital records and other data sources in the trauma registry	E
• Centrally coordinated communication for immediate universal trauma system access for referral (advice, consultation, triage, transport)	E
• Systematic and timely repatriation process	E
• Guaranteed access to appropriate level of care in a timely fashion	E

Section VI CRITERIA FOR TRAUMA CENTRES

Preamble

The criteria within this section of the document represent individual components of each site and the system, it must be recognized that meeting these components does not replace meeting the major concepts and requirements of a regional trauma system as outlined in previous sections of this document.

E=Essential, D=Desirable, N=Not Essential

- ① It is essential for Level III - V to have the Emergency Physician or the General Surgeon act as trauma team leader
- ② Must be available on call with a 30 min maximum response time
- ③ Not essential if provided at a dedicated alternate site
- ④ Pediatric Subspecialty training required
- * CCFP (EM) or RCPS (Royal College)

Note: In Level I, II, Centres it is expected that the on-call General Surgery would have added competencies in Trauma Care

A. Trauma System Integration	I	II	III	IV	V	P-I	P-II
• Leadership role within the system (administrative, planning, clinical programs)	E	E	D	N	N	E	E
• Defined roles within the system	E	E	E	E	E	E	E
• Participation within Trauma System Advisory Body	E	E	E	D	D	E	E
• Participation in System PIPS	E	E	E	E	E	E	E
• Participation in System Injury Surveillance	E	E	E	E	E	E	E
• Participation in National Trauma Registry (CDS)	E	E	E	D	N	E	E
• Trauma Outreach Education	E	E	D	N	N	E	E
• Injury Prevention	E	E	D	D	D	E	E
• Emergency Preparedness	E	E	E	E	E	E	E
• Academics and Scholarship	E	D	D	N	N	E	D

B. Hospital Commitment	I	II	III	IV	V	P-I	P-II
• Trauma as designated priority program/service	E	E	D	N	N	E	E
• Demonstrated commitment to priority treatment of severely injured patients	E	E	E	E	E	E	E
• Assure adequate resources and staff (as per level requirements)	E	E	E	E	E	E	E
• Demonstrated financial support to trauma program	E	E	E	D	N	E	E
• No refusal policy for major trauma	E	E	E	N	N	E	E
• Trauma Registry participation/funding	E	E	E	D	N	E	E
• Funding for trauma team leader program	E	E	D	N	N	E	E

C. Trauma Leadership Roles	I	II	III	IV	V	P-I	P-II
• A Medical Director responsible for Clinical Trauma Services	E	E	E	D	N	E④	E④
• Trauma program manager/director who has the responsibility and authority for coordination and management of trauma care in collaboration with the Trauma Director	E	E	E	D	N	E	E
• Co leadership of Trauma Program/Administration	E	E	E	D	N	E	E
• Financial support for leadership roles	E	E	E	D	N	E	E
• Trauma Coordinator (funded)	E	D	D	D	N	E	D

D. Trauma Services	I	II	III	IV	V	P-I	P-II
i. 24 hour trauma team response to include:	E	E	D①	D①	N①	E④	E
• Trauma team leader (max 20 min response)							
• General Surgery emergency department bedside consultation (per defined local protocol, max 20 min response)	E	E	E	D①	D①	E④	E④
• Other surgical consultation as required *(max 30 min response)	E	E	D	D	D	E④	E
• In house advanced airway intervention capability at all times	E	E	E	E	D	E④	E④
ii. Protocols in place for recognition of major trauma patient, communication and transport to appropriate level of care within the Trauma System	E	E	E	E	E	E④	E④
iii. A Surgeon-led multi-disciplinary inpatient trauma service within the hospital	E	E	D	N	N	E④	D④
iv. 24-hour hospital coverage by the following surgical services	E	E	E	D	D	E④	E
• Trauma Surgeon, General Surgeon (max 20 min)							
• Orthopedic Surgery②	E	E	E	N	N	E④	E
• Neurosurgery②	E	E	D	N	N	E④	E
• Plastic Surgery	E	E	D	N	N	E④	D
• Spine Surgery	E	D	N	N	N	E④	D
• Burn Surgery	E	N	N	N	N	E④	D
• Vascular Surgery②	E	E	N	N	N	E	D
• Endovascular Services	E	D	N	N	N	E	D
• Cardiac Surgery	D	D	N	N	N	D	D
• Thoracic Surgery	D	D	N	N	N	D	D
• Urology	E	E	N	N	N	E④	D
• Gynecology & Obstetrics②	E	E	D	N	N	E④	D
• Pediatric Surgery②③	E③	E③	N	N	N	E④	E④
• Ophthalmology	E	E	D	N	N	E④	D
• Otolaryngology	E	E	D	N	N	E④	D
• Dental/OMFS	D	D	D	N	N	E④	D
v. Non-Surgical Specialties for care of the trauma patient	E	E	E	E	N	E④	E
• Emergency Medicine							

• Radiology②	E	E	E	E	N	E④	D
• Anesthesia (20 min response)	E	E	E	E	D	E④	E
• Critical Care②	E	E	E	N	N	E④	E④
• Cardiology	E	E	D	N	N	E④	E
• Gastroenterology	D	D	D	D	N	D④	D
• Neurology	D	D	D	N	N	E④	D
• Hematology –Transfusion Medicine	E	E	D	N	N	E④	E
• Infectious Diseases	E	E	D	N	N	E④	E
• Internal Medicine	E	E	E	E	N	E④	E④
• Nephrology	E	E	D	N	N	E④	E
• Psychiatry	E	E	D	N	N	E④	E
• Psychology	E	E	D	N	N	E④	E
• Physiatry	E	E	D	N	N	E④	D
• Social Work	E	E	E	E	E	E	E
• Child Life	N	N	N	N	N	E	D
• Family Support Programs and spiritual care	E	E	E	E	E	E	E
• Child Protection Services	D	D	D	D	D	E	E

E. Emergency Department	I	II	III	IV	V	P-I	P-II
i. Personnel and Practice							
• Designated chief, certified* Emergency physician	E	E	E	E	D	E④	E
• Use of trauma practice guidelines	E	E	E	E	E	E④	E
• Criteria for identifying major trauma patient/TTA	E	E	E	E	E	E④	E
• Trauma Team Activation Process	E	E	E	N	N	E	E
• ATLS/or equivalent education of Trauma Team Leaders and Emergency Physicians	E	E	E	E	E	E	E
• TNCC/or equivalent trauma nursing education	E	E	E	E	E	E	E
• Communication and Transfer guidelines	E	E	E	E	E	E	E
• CTAS utilization	E	E	E	E	E	E	E
ii. Trauma Specific Equipment required in the Emergency Department							
• Advanced airway management equipment including surgical airway (adults & children)	E	E	E	E	E	E	E
• Broeslow tape	E	E	E	E	E	E	E
• Central and peripheral vascular access including intraosseous equipment	E	E	E	E	E	E④	E
• Chest tubes	E	E	E	E	E	E④	E④
• Fracture stabilization & traction equipment	E	E	E	E	E	E④	E
• Monitors (transport, bedside, fetal)	E	E	E	D	D	E	E
• Portable or overhead X-ray equipment	E	E	E	E	D	E	E
• Portable ultrasound for FAST	E	E	D	D	N	D	D
• Quantitative end tidal CO2 monitor	E	E	E	D	N	E	E
• Rapid infusion warmer	E	E	E	D	N	E	E
• Surgical equipment (i.e. DPL, thoracotomy tray)	E	E	E	D	N	E④	E
• Tourniquets	E	E	E	E	E	E	D
• Trauma resuscitation room	E	E	E	D	N	E	E
• Tourniquets	E	E	E	E	E	E	D

• Universal Precautions equipment	E	E	E	E	E	E	E
• Vascular Doppler	E	E	E	D	D	E	E
• Warming devices (e.g. Bair hugger, warm blankets)	E	E	E	E	D	E	E
iii. Air Medical access (Rotor wing and/or fixed)	E	E	E	N	E	E	E

F. Blood Bank and Laboratory System	I	II	III	IV	V	P-I	P-II
• Available on site 24 hours per day	E	E	E	D	N	E	E
• Blood bank system capable of providing unmatched blood within 10 minutes	E	E	E	D	N	E	E
• Formalized Massive transfusion protocol	E	E	D	D	N	E④	E④
• Accredited by Canadian Blood Services and labs	E	E	E	E	E	E	E

G. Diagnostic and Interventional Radiology	I	II	III	IV	V	P-I	P-II
• Immediate plain film radiography (in-house tech)	E	E	E	D	D	E	E
• Technologist on Call with 30 min response	-	-	-	E	D	-	-
• Radiologist consultation (30 min)	E	E	D	D	D	E④	E④
• Provincial/Regional PACS or equivalent system	E	E	E	E	D	E	E
• Angiography available 24/7 with 1 hour response	E	E	D	N	N	E	E
• Ultrasonography	E	E	E	N	N	E	E
• Immediate CT (in-house tech)	E	E	D	N	N	D	D
• CT Technologist on Call with 30 min response	-	-	E	E	N	E	E
• Access to magnetic resonance imaging	E	E	N	N	N	E	E
• CT Adjacent to Emergency Department	E	E	D	N	N	E	E
• Radiology Protocols for imaging of Trauma patients (including pediatric)	E	E	E	E	N	E	E

H. Operating Room	I	II	III	IV	V	P-I	P-II
• Anesthesia availability within 20 min response time	E	E	E	D	N	E	E
• In-house 24 hour operating room nursing staff available for immediate surgery with the necessary equipment	E	E	D	D	N	D	D
• 30 minute call back for operating room nursing staff for immediate surgery	--	--	E	D	N	E	E
• Demonstrated formalized prioritization system for trauma cases	E	E	D	N	N	E	E
• Availability of protected OR time for urgent trauma cases (i.e. ortho/plastics)	E	E	D	N	N	D	D
• Perfusion Services and core re-warming capability	E	E	D	N	N	E	D

I. Intensive Care Unit:	I	II	III	IV	V	P-I	P-II
• Medical Director of Intensive Care	E	E	E	N	N	E④	E
• 24 hr in-hospital critical care physician coverage	E	E	D	N	N	E④	E④
• Closed ICU model	E	E	D	N	N	E④	E④
• Co-management with surgical team	E	E	E	N	N	E	E
• Trauma practice guidelines	E	E	E	N	N	E④	E④
• No refusal policy for major trauma patient	E	E	D	N	N	E	E
• Transfer Protocols to/from higher level ICU	E	E	E	E	E	E	E

J. Inpatient Trauma Units	I	II	III	IV	V	P-I	P-II
• Guaranteed Access to Trauma Beds	E	E	E	N	N	E	E
• Dedicated Trauma Unit (cohorting trauma patients)	E	E	D	N	N	E	E
• Capacity for intermediate care with monitoring	E	E	D	N	N	E④	E④
• Trauma Practice Guidelines	E	E	E	N	N	E④	E④
• Dedicated allied health resources	E	E	D	N	N	E④	E

K. Performance Improvement and Patient Safety (PIPS) Programs	I	II	III	IV	V	P-I	P-II
• Continuous multi-professional PIPS Program	E	E	E	N	N	E	E
• Trauma registry support of PIPS Program	E	E	E	N	N	E	E
• Trauma PIPS Committee	E	E	E	N	N	E	E
• Public Accountability (outcome data for trauma)	E	E	E	N	N	E	E
• <u>Process Improvement</u>							
▪ Define process indicators	E	E	E	N	N	E	E
▪ Defined clinical practice guidelines for trauma	E	E	E	E	E	E	E
▪ Measure of compliance with guidelines /indicators	E	E	E	E	E	E	E
• <u>Outcome Measures</u>							
▪ Review of all deaths with yearly report	E	E	E	E	E	E	E
▪ Review of morbidity with yearly report	E	E	E	E	E	E	E
▪ Benchmarking with Standards	E	E	E	D	D	E	E

L. Injury Surveillance	I	II	III	IV	V	P-I	P-II
• Presence of Trauma Registry	E	E	E	D	N	E	E
• Contribution to NTR (comprehensive data set)	E	E	E	D	N	E	E
• Standardized regular reports to program leadership	E	E	E	N	N	E	E
• Review of hospital trauma caseload (inpatient, ambulatory)	E	E	E	N	N	E	E
• Capacity for ad hoc reporting	E	E	E	N	N	E	E
• Trauma Registry formally integrated within the Trauma Program	E	E	E	N	N	E	E
• Meets privacy act regulations	E	E	E	N	N	E	E

M. Trauma Research	I	II	III	IV	V	P-I	P-II
• Initiation, participation and dissemination of trauma research	E	D	D	D	D	E	E

N. Injury Prevention	I	II	III	IV	V	P-I	P-II
• Injury prevention and control program participation.	E	E	E	E	E	E	E
• Injury prevention coordinator (funded)	E	E	D	N	N	E	D
• Alcohol and substance abuse Screening Programs	E	E	D	D	D	E	D
• Alcohol and substance abuse Intervention Programs	E	E	D	D	D	E	D
• Leadership for regional IP policy development	E	E	D	D	D	E	E

Section VII REFERENCES

- Bulger EM, Maier RV. Prehospital Care of the Injured: What's New. *Surg Clin North Am*. 2007 Feb; 87(1):37-53, VI. Review.
- Cooper G, Laskowski-Jones L. Development of Trauma Care Systems. *Prehosp Emerg Care*. 2006 Jul-Sep; 10(3):328-31.
- DeBritz JN, Pollak AN. The Impact of Trauma Centre Accreditation on Patient Outcome. *Injury*. 2006 Dec; 37(12):1166-71.
- Demetriades D, Martin M, Salim A, et al: The Effect of Trauma Centre Designation and Trauma Volumes on Outcome in Specific Severe Injuries. *Ann Surg* 242: 512-519, 2005.
- Ehrlich, PF, McClellan WT, Wesson DE: Monitoring Performance: Long-Term Impact of Trauma Verification and Review. *J Am Coll Surg* 200:166-172, 2005.
- Garrison HG, Foltin GL, Becker LR, Chew JL, Johnson M, Madsen GM, Miller DR, Ozmar BH. The Role of Emergency Medical Services in Primary Injury Prevention. East Carolina Injury Prevention Program. *Prehosp Emerg Care*. 1997 Jul-Sep: 1(3):156-62. Reviews.
- Holbrook TL, Hoyt DB, Anderson JP, et al: Functional Limitation After Major Trauma: A More Sensitive Assessment Using The Quality of Well-Being Scale: The Trauma Recovery Pilot Project. *J Trauma* 36:74-78, 1994.
- Holbrook TL, Anderson JP, Sieber WJ, et al: Outcome After Major Trauma: 12 month and 18 month follow-up results from the trauma recovery project. *J Trauma* 46:765-773, 1999.
- Krimston J, Griffiths K. EMS Champions of Injury Prevention. Highlights from some of the best injury-prevention programs in the United States. *JEMS*. 2004 Nov; 29(11):80-4.
- MacKenzie, EJ, Cushing BM, Jurkovich GH, et al: Physical Impairment and Functional Outcomes six months after severe lower extremity fractures. *J Trauma* 34:528-539, 1993.
- Mullins RJ, Veum-Stone J, Hedges JR, et al: Influence of Statewide Trauma System on location of hospitalization and outcome of injured patients. *J Trauma* 40:536-546, 1996.
- Nathens, AB, Brunet FP, Maier RV: Development of Trauma Systems and Effect on Outcomes after Injury. *Lancet* 363:1794-1801, 2004.
- Nathens AB, Jurkovich GJ, Maier RV, et al: Relationship Between Trauma Centre Volume and Outcomes. *JAMA* 285:1164-1171, 2001.
- Pasquale MD, Peitzman AB, Bednarski J, et al: Outcomes Analysis of Pennsylvania Trauma Centres: factors predictive of non-survival in seriously injured patients. *J Trauma* 50:465-474, 2001.

- Piontek FA, Coscia R, Marselle CS, et al. American College of Surgeons. Impact of American College of Surgeons Verification on Trauma Outcomes. *J Trauma*. 2003 Jun; 54(6):1041-6; discussion 1046-7.
- Resources for Optimal Care of the Injured Patient 2006, ACS 2006.
- Resources for Optimal Care of the Injured Patient 1999, ACS 1999.
- Segui-Gomez M, Chang DC, Paidas CN, et al: Pediatric Trauma Care: an overview of pediatric trauma systems and their practices in 18 US states. *J Pediatric Surg* 38:1162-1169, 2003.
- Sampalis JS, Lavoie A, Boukas S, et al: Trauma Centre Designation: initial impact on trauma -related mortality. *J Trauma* 39:232-239, 1995.
- Simons R, Kirkpatrick A. Assuring Optimal Trauma Care: the role of trauma centre accreditation. *Can J Surg*. 2002 Aug; 45(4):288-95.
- Simons RK. Injury Control and Trauma Care in Canada: How Well Are We Doing? Trauma Association of Canada Presidential Address. *J Trauma*. 2006 Nov; 61(5):1027-35.
- Simons R, Kasic S, Kirkpatrick A, et al: Relative Importance of Designation and Accreditation of Trauma Centres during evolution of a regional trauma system. *J Trauma* 52:827-834, 2002.
- SMART RISK, The Economic Burden of Injury in Canada. SMART RISK: Toronto, ON. 2009.
- Smith RF, Frateschi L, Sloan EP, et al: The Impact of Volume on Outcome in Seriously Injured Patients: two years' experience of the Chicago trauma system. *J Trauma* 30:1066-1076, 1990.
- Udekwi P. Trauma Centre Designation and Outcomes. *J Am Coll Surg*. 2006 Jun; 202(6):1025.
- US Department of Transportation, National Highway Traffic Safety Administration: Rural Preventable Mortality Study. Publication DOT HS 807-973, 1992.
- US Department of Health and Human Services, Health Resources and Services Administration, Trauma-EMS Systems Program: Model Trauma Systems Planning and Evaluation, February 2006. Available at www.hrsa.gov/trauma/model.htm.
- West JG, Williams MJ, Trunkey DD, et al: Trauma Systems: Current Status: Future Challenges. *JAMA* 259:3597-3600, 1988.

Section VIII APPENDICES

Appendix A	Application for Accreditation
Appendix B	Application for Pre-Accreditation Consultation
Appendix C	Criteria for Trauma Systems/Centres
Appendix D	Pre-Accreditation Questionnaire
Appendix E	Schedule of Visit
Appendix F	Accreditation Evaluation

APPENDIX A
Application for Trauma Accreditation Review

Please complete and return to:

Trauma Association of Canada Central Office
 c/o Regional Trauma Services
 Foothills Medical Centre
 Rm EG23, 1403-29th Street N.W.
 Calgary, AB T2N 2T9

From: _____

Phone: _____

Fax: _____

Date of Application: _____

Requesting Health Authority/Region: _____

Name/level of designation seeking: _____

List sites (<input checked="" type="checkbox"/> check box corresponding with level)	I	II	III	IV	V	PI	PII

Define the system: Regional Provincial Other

Preferred time frame for the site visit is: _____

Earliest dates: _____

Latest dates: _____

1. Request for Trauma Accreditation:

Please proceed with arrangements for a Trauma Accreditation Review. We understand that:

- a. Trauma Accreditation is a formal review of compliance with national guidelines for the delivery of optimal care within an integrated trauma system
- b. A preliminary report sent to the Trauma Director at each site (est. 4-6 weeks) to review for factual data prior to final report going to TAC president and CEO
- c. The Association will provide a written report with recommendations and accreditation status within 8 weeks to the CEO

2. We agree to remunerate the following expenses:

- a. Travel for team, including taxis to and from airport, to and from site visits, car rental if needed, parking
- b. All accommodation and meal expenses for review team
- c. Fees per Team member per day of \$1000.00 (this includes preparation of reports)
- d. Teams will be capped at 4, or for single hospital site reviews, 3 team members, this will be at the discretion of TAC accreditation executive
- e. There may be an accreditation trainee on site visits; this will be at no additional cost to the site
- f. A separate payment to the Trauma Association of Canada \$1000.00 fee per institution or day is also required

3. Please attach a letter of support or commitment for this process from CEO/President of applying site/region/authority.

4. Contact Information:

Medical Director/Manager of Trauma

Name: _____

Title: _____

Address: _____

Phone: _____

Fax: _____

E-mail: _____

Signature: _____

Trauma Program Manager/Coordinator

Name: _____

Title: _____

Address: _____

Phone: _____

Fax: _____

E-mail: _____

Signature: _____

CEO or President of applying site/region/authority

Name: _____

Title: _____

Address: _____

Phone: _____

Fax: _____

E-mail: _____

Signature: _____

**** Applications should be submitted a minimum 4-6 months
before desired date for the review****

APPENDIX B
Application for Trauma Consultation
Or Pre-Accreditation Review

Please complete and return to:

Trauma Association of Canada Central Office
 c/o Regional Trauma Services
 Foothills Medical Centre
 Rm EG23, 1403-29th Street N.W.
 Calgary, AB T2N 2T9

From: _____

Phone: _____

Fax: _____

Date of Application: _____

Requesting Health Authority/Region: _____

Name/level of designation seeking: _____

List sites (<input checked="" type="checkbox"/> check box corresponding with level)	I	II	III	IV	V	PI	PII

Define the system: Regional Provincial Other

Preferred time frame for the site visit is:

Earliest dates: _____

Latest dates: _____

5. Request for Trauma Consultation:

Please proceed with arrangements for a Trauma Consultation as a Pre-Accreditation Review. We understand that:

- a. Trauma Consultation is a review of compliance with national guidelines for the delivery of optimal care within an integrated trauma system.
- b. A preliminary report sent to the Trauma Director at each site (est. 4-6 weeks) to review for factual data prior to final report going to TAC president and CEO
- c. The Association will provide a written report with recommendations within 8 weeks to the CEO
- d. Extensive trauma system/service development and consultation is also available on ad hoc request

6. We agree to remunerate the following expenses:

- a. Travel for team, including taxis to and from airport, to and from site visits, car rental if needed, parking
- b. All accommodation and meal expenses for review team
- c. Fees cost per Team member per day of \$1000.00
- d. A separate payment to the Trauma Association of Canada \$1000.00 fee per institution or day is also required

7. Please attach a letter of support or commitment for this process from CEO/President of applying site/region/authority.

8. Contact Information:

Medical Director/Manager of Trauma

Name: _____

Title: _____

Address: _____

Phone: _____

Fax: _____

E-mail: _____

Signature: _____

Trauma Program Manager/Coordinator

Name: _____

Title: _____

Address: _____

Phone: _____

Fax: _____

E-mail: _____

Signature: _____

CEO or President of applying site/region/authority

Name: _____

Title: _____

Address: _____

Phone: _____

Fax: _____

E-mail: _____

Signature: _____

**** Applications should be submitted a minimum 4-6 months before desired date for the review****

The TAC Consultation Process or Pre-Accreditation Review is an overview of compliance with TAC Accreditation Guidelines for Trauma Systems and Centres. This consult visit is a guide for preparing for formal TAC accreditation site visit.

More extensive Trauma System/Service design and development consultation is also available on an ad hoc request, but is not the mandate of the Trauma Association of Canada. As experts in Trauma System development, TAC can provide you with contacts that may choose to provide independent consultancy. The consultation cost for this type of request is subject to individual consultant fees.

APPENDIX C

Criteria for Trauma Systems/Centres (Working Document)

**Please check box next to designation seeking if criteria met and submit with
Appendix D – Pre-Accreditation Questionnaire prior to site visit**

E=Essential, D=Desirable, N=Not Essential

- ❶ It is essential for Level III - V to have the Emergency Physician or the General Surgeon act as trauma team leader
- ❷ Must be available on call with a 30 min maximum response time
- ❸ Not essential if provided at a dedicated alternate site
- ❹ Pediatric Subspecialty training required
- * CCFP (EM) or RCPS (Royal College)

Note: In Level I, II, Centres it is expected that the on-call General Surgery would have added competencies in Trauma Care

A. Trauma System Integration	I	II	III	IV	V	P I	P II	—
• Leadership role within the system (administrative, planning, clinical programs)	E	E	D	N	N	E	E	
• Defined roles within the system	E	E	E	E	E	E	E	
• Participation within Trauma System Advisory Body	E	E	E	D	D	E	E	
• Participation in System PIPS	E	E	E	E	E	E	E	
• Participation in System Injury Surveillance	E	E	E	E	E	E	E	
• Participation in National Trauma Registry (CDS)	E	E	E	D	N	E	E	
• Trauma Outreach Education	E	E	D	N	N	E	E	
• Injury Prevention	E	E	D	D	D	E	E	
• Emergency Preparedness	E	E	E	E	E	E	E	
• Academics and Scholarship	E	D	D	N	N	E	D	

B. Hospital Commitment	I	II	III	IV	V	P I	P II	—
• Trauma as designated priority program/service	E	E	D	N	N	E	E	
• Demonstrated commitment to priority treatment of severely injured patients	E	E	E	E	E	E	E	
• Assure adequate resources and staff (as per level requirements)	E	E	E	E	E	E	E	
• Demonstrated financial support to trauma program	E	E	E	D	N	E	E	
• No refusal policy for major trauma	E	E	E	N	N	E	E	
• Trauma Registry participation/funding	E	E	E	D	N	E	E	
• Funding for trauma team leader program	E	E	D	N	N	E	E	

C. Trauma Leadership Roles	I	II	III	IV	V	P I	P II
• A Medical Director responsible for Clinical Trauma Services	E	E	E	D	N	E ⁴	E ⁴
• Trauma program manager/director who has the responsibility and authority for coordination and management of trauma care in collaboration with the Trauma Director	E	E	E	D	N	E	E
• Co leadership of Trauma Program/Administration	E	E	E	D	N	E	E
• Financial support for leadership Roles	E	E	E	D	N	E	E
• Trauma Coordinator (funded)	E	D	D	N	N	E	D

D. In-Patient Trauma Services	I	II	III	IV	V	P I	P II
i. 24 hour trauma team response to include:	E	E	D ¹	N ¹	N ¹	E ⁴	E
• Trauma team leader (max 20 min response)							
• General Surgery emergency department bedside consultation (per defined local protocol, max 20 min response)	E	E	E	D ¹	D ¹	E ⁴	E ⁴
• Other surgical consultation as required *(max 30 min response)	E	E	D	D	D	E ⁴	E
• In house advanced airway intervention capability at all times	E	E	E	E	D	E ⁴	E ⁴
ii. Protocols in place for recognition of major trauma patient, communication and transport to appropriate level of care within the Trauma System	E	E	E	E	E	E ⁴	E ⁴
iii. A Surgeon-led multi-disciplinary inpatient trauma service within the hospital	E	E	D	N	N	E ⁴	D ⁴
iv. 24-hour hospital coverage by the following surgical services							
• Trauma Surgeon, General Surgeon (max 20 min)	E	E	E	D	D	E ⁴	E
• Orthopedic Surgery ²	E	E	E	N	N	E ⁴	E
• Neurosurgery ²	E	E	D	N	N	E ⁴	E
• Plastic Surgery	E	E	D	N	N	E ⁴	D
• Spine Surgery	E	D	N	N	N	E ⁴	D
• Burn Surgery	E	N	N	N	N	E ⁴	D
• Vascular Surgery ²	E	E	N	N	N	E	D
• Endovascular Services	E	D	N	N	N	E	D
• Cardiac Surgery	D	D	N	N	N	D	D
• Thoracic Surgery	D	D	N	N	N	D	D
• Urology	E	E	N	N	N	E ⁴	D
• Gynecology & Obstetrics ²	E	E	D	N	N	E ⁴	D
• Pediatric Surgery ^{2 3}	E ³	E ³	N	N	N	E ⁴	E ⁴
• Ophthalmology	E	E	D	N	N	E ⁴	D
• Otolaryngology	E	E	D	N	N	E ⁴	D
• Dental / OMFS	D	D	D	N	N	E ⁴	D
v. Non-Surgical Specialties for care of the trauma patient							
• Emergency Medicine ²	E	E	E	E	N	E ⁴	E

• Radiology②	E	E	E	E	N	E④	D
• Anesthesia (20 min response)	E	E	E	E	D	E④	E
• Critical Care②	E	E	E	N	N	E④	E④
• Cardiology	E	E	D	N	N	E④	E
• Gastroenterology	D	D	D	D	N	D④	D
• Neurology	D	D	D	N	N	D④	D
• Hematology –Transfusion Medicine	E	E	D	N	N	E④	E
• Infectious Diseases	E	E	D	N	N	E④	E
• Internal Medicine	E	E	E	E	N	E④	E④
• Nephrology	E	E	D	N	N	E④	E
• Psychiatry	E	E	D	N	N	E④	E
• Psychology	E	E	D	N	N	E④	E
• Physiatry	E	E	D	N	N	E④	D
• Social Work	E	E	E	E	E	E	E
• Child Life	N	N	N	N	N	E	D
• Family Support Programs and spiritual care	E	E	E	E	E	E	E
• Child Protection Services	D	D	D	D	D	E	E

E. Emergency Department	I	II	III	IV	V	P I	P II
i. Personnel and Practice							
• Designated chief, certified* Emergency physician	E	E	E	E	D	E④	E
• Use of trauma practice guidelines	E	E	E	E	E	E④	E
• Criteria for identifying major trauma patient/TTA	E	E	E	E	E	E④	E
• Trauma Team Activation Process	E	E	E	N	N	E	E
• ATLS/or equivalent education of Trauma Team Leaders and Emergency Physicians	E	E	E	E	E	E	E
• TNCC/or equivalent trauma nursing education	E	E	E	E	E	E	E
• Communication and Transfer guidelines	E	E	E	E	E	E	E
• CTAS utilization	E	E	E	E	E	E	E
ii. Trauma Specific Equipment required in the Emergency Department							
• Advanced airway management equipment including surgical airway (adults & children)	E	E	E	E	E	E	E
• Broeslow tape	E	E	E	E	E	E	E
• Central and peripheral vascular access including intraosseous equipment	E	E	E	E	E	E④	E
• Chest tubes	E	E	E	E	E	E④	E④
• Fracture stabilization & traction equipment	E	E	E	E	E	E④	E
• Monitors (transport, bedside, fetal)	E	E	E	D	D	E	E
• Portable or overhead X-ray equipment	E	E	E	E	D	E	E
• Portable ultrasound for FAST	E	E	D	D	N	D	D
• Quantitative end tidal CO2 monitor	E	E	E	D	N	E	E
• Rapid infusion warmer	E	E	E	D	N	E	E
• Surgical equipment (i.e. DPL, thoracotomy tray)	E	E	E	D	N	E④	E
• Tourniquets	E	E	E	E	E	E	D
• Trauma resuscitation room	E	E	E	D	N	E	E
• Tourniquets	E	E	E	E	E	E	D
• Universal Precautions equipment	E	E	E	E	E	E	E

• Vascular Doppler	E	E	E	D	D	E	E
• Warming devices (e.g. Bair hugger, warm blankets)	E	E	E	E	D	E	E
iii. Air Medical access (Rotor wing and/or fixed)	E	E	E	N	E	E	E

F. Blood Bank and Laboratory System	I	II	III	IV	V	P I	P II
• Available on site 24 hours per day	E	E	E	D	N	E	E
• Blood bank system capable of providing unmatched blood within 10 minutes	E	E	E	D	N	E	E
• Formalized Massive transfusion protocol	E	E	D	D	N	E④	E④
• Accredited by Canadian Blood Services and labs	E	E	E	E	E	E	E

G. Diagnostic and Interventional Radiology	I	II	III	IV	V	P I	P II
• Immediate plain film radiography (in-house tech)	E	E	E	D	D	E	E
• Technologist on Call with 30 min response	-	-	-	E	D	-	-
• Radiologist consultation (30 min)	E	E	D	D	D	E④	E④
• Provincial/Regional PACS or equivalent system	E	E	E	E	D	E	E
• Angiography available 24/7 with 1 hour response	E	E	D	N	N	E	E
• Ultrasonography	E	E	E	N	N	E	E
• Immediate CT (in-house tech)	E	E	D	N	N	D	D
• CT Technologist on Call with 30 min response	-	-	E	E	N	E	E
• Access to magnetic resonance imaging	E	E	N	N	N	E	E
• CT Adjacent to Emergency Department	E	E	D	N	N	E	E
• Radiology Protocols for imaging of Trauma patients (including pediatric)	E	E	E	E	N	E	E

H. Operating Room	I	II	III	IV	V	P I	P II
• Anesthesia availability within 20 min response time	E	E	E	D	N	E	E
• In-house 24 hour operating room nursing staff available for immediate surgery with the necessary equipment	E	E	D	D	N	D	D
• 30 minute call back for operating room nursing staff for immediate surgery	-	-	E	D	N	E	E
• Demonstrated formalized prioritization system for trauma cases	E	E	D	N	N	E	E
• Availability of protected OR time for urgent trauma cases (i.e. ortho/plastics)	E	E	D	N	N	D	D
• Perfusion Services and core re-warming capability	E	E	D	N	N	E	D

I. Intensive Care Unit:	I	II	III	IV	V	P I	P II
• Medical Director of Intensive Care	E	E	E	N	N	E④	E
• 24 hr in-hospital critical care physician coverage	E	E	D	N	N	E④	E④
• Closed ICU model	E	E	D	N	N	E④	E④
• Co-management with surgical team	E	E	E	N	N	E	E
• Trauma practice guidelines	E	E	E	N	N	E④	E④
• No refusal policy for major trauma patient	E	E	D	N	N	E	E
• Transfer Protocols to/from higher level ICU	E	E	E	E	E	E	E

J. Inpatient Trauma Units	I	II	III	IV	V	P I	P II
• Guaranteed Access to Trauma Beds	E	E	E	N	N	E	E
• Dedicated Trauma Unit (cohorting trauma patients)	E	E	D	N	N	E	E
• Capacity for intermediate care with monitoring	E	E	D	N	N	E④	E④
• Trauma Practice Guidelines	E	E	E	N	N	E④	E④
• Dedicated allied health resources	E	E	D	N	N	E④	E

K. Performance Improvement and Patient Safety (PIPS) Programs	I	II	III	IV	V	P I	P II
• Continuous multi-professional PIPS Program	E	E	E	N	N	E	E
• Trauma registry support of PIPS Program	E	E	E	N	N	E	E
• Trauma PIPS Committee	E	E	E	N	N	E	E
• Public Accountability (outcome data for trauma)	E	E	E	N	N	E	E
• <u>Process Improvement</u>							
▪ Define process indicators	E	E	E	N	N	E	E
▪ Defined clinical practice guidelines for trauma	E	E	E	E	E	E	E
▪ Measure of compliance with guidelines/indicators	E	E	E	E	E	E	E
• <u>Outcome Measures</u>							
▪ Review of all deaths with yearly report	E	E	E	E	E	E	E
▪ Review of morbidity with yearly report	E	E	E	E	E	E	E
▪ Benchmarking with Standards	E	E	E	D	D	E	E

L. Injury Surveillance	I	II	III	IV	V	P I	P II
• Presence of Trauma Registry	E	E	E	D	N	E	E
• Contribution to NTR (comprehensive data set)	E	E	E	D	N	E	E
• Standardized regular reports to program leadership	E	E	E	N	N	E	E
• Review of hospital trauma caseload (inpatient, ambulatory)							
• Capacity for ad hoc reporting	E	E	E	N	N	E	E
• Trauma Registry formally integrated within the Trauma Program	E	E	E	N	N	E	E
• Meets privacy act regulations	E	E	E	N	N	E	E

M. Trauma Research	I	II	III	IV	V	P I	P II
• Initiation, participation and dissemination of trauma research	E	D	D	D	D	E	E

N. Injury Prevention	I	II	III	IV	V	P I	P II
• Injury prevention and control program participation.	E	E	E	E	E	E	E
• Injury prevention coordinator (funded)	E	E	D	N	N	E	D
• Alcohol and substance abuse Screening Programs	E	E	D	D	D	E	D
• Alcohol and substance abuse Intervention Programs	E	E	D	D	D	E	D
• Leadership in advocacy towards regional IP policy development	E	E	D	D	D	E	E

APPENDIX D
Pre-Accreditation Questionnaire
To be completed and submitted 4 weeks prior to site visit
(electronic submission preferred for questionnaire)

Section I
TRAUMA SYSTEMS
(to be filled out once for the system review)

Provincial

1. Describe the provincial trauma leadership/lead agency, the provincial trauma structure/system and its advisory body, membership and reporting relationships, and funding structure.
2. Describe the various components of the provincial trauma program;
 - i. Pre-hospital EMS, (ground, air, communications, dispatch and interfacility transfer)
 - ii. Provincial Emergency Preparedness
 - iii. Injury prevention
 - iv. Provincial Injury Surveillance (i.e. Trauma Registry and/or other)
 - v. Rehabilitation services
 - vi. Public Accountability (demonstrated reporting)
 - vii. Standardized Practice Guidelines
 - viii. Inter-provincial/Territory Agreements
3. What are the injury rates, hospitalization rates for trauma and trauma death rates in your province. How have they changed over the last 5 – 10 years and what injury control measures have been introduced over that time period.

Regional

1. Describe your regional trauma system including geographical boundaries, catchment areas, and population and hospitals served. Please include map of regional mandate.
2. Describe your regional trauma system's governance and mandate. Define its reporting structure, funding structure and organizational charts along with its advisory structure and membership, and its relationship to the provincial trauma structure.

3. Describe the various components of your regional trauma system and how they are linked to the program including (only if different from provincial);
 - i. Pre-hospital EMS, (ground, air, communications, dispatch and interfacility transfer)
 - ii. Provincial Emergency Preparedness
 - iii. Injury prevention
 - iv. Provincial injury surveillance (i.e. Trauma Registry and/or other)
 - v. Rehabilitation services
 - vi. Public Accountability (demonstrated reporting)
 - vii. Standardized Practice Guidelines
 - viii. Inter-provincial/Territory Agreements
4. Describe your system's configuration in terms of designated trauma centres; level of designation, caseload, acuity and case mix by site and the role of each centre in the system.
5. Describe, if available, hospitalization rates and ED discharges for injury in your system along with 5 and 10-year trends by site and for the entire system. (Minimal Data Set, Comprehensive Data Set, NACRS etc.).
6. Describe your system wide performance improvement programs, process and outcome indicators. Please provide system-wide performance improvement and outcome data for review at time of site visit.
7. Attach the trauma system annual report (if available).

Emergency Medical Services System (EMS)

Briefly describe the pre-hospital system as outlined in the questions below. Trauma related protocols, policies or procedures from EMS providers should be available for creditors to review during the site visit (Specific Protocols needed for accreditors: Trauma Destination Policy (see question 2 below), airway management protocol in the trauma patient/rapid sequence intubation protocol, surgical airway protocol, chest decompression protocol; others may be added at site discretion). Adult and Pediatric differences should be defined in the context of destination policies or as per above protocols.

1. Describe your EMS communication systems i.e.; access lines, support lines and critical care line processes, geographic mandate, 911/911 e-capabilities and integration of 911 system with EMS communications and pre-arrival instructions personnel.
2. Do you have a field trauma triage protocol (ground and air) including;
 - i. Definition of major trauma
 - ii. Trauma destination protocols including hospital bypass
 - iii. Transportation protocols (ground, fixed wing, rotary)

Please provide for review by accreditors.

3. Describe the pre-hospital care delivery model (public utility model, independent company, municipal contract model). How many EMS provider services exist within your system. What is the level of paramedic (primary care paramedic to critical care paramedic) providing ground services.
4. Describe your quality improvement process for pre-hospital trauma care. Please comment on average scene time, average time to initial hospital from first EMS contact and average time to final or tertiary hospital destination from first EMS contact.
5. Is the Trauma System (i.e. other components of the trauma system such as receiving hospitals) actively involved/partnered in EMS QA initiatives.
6. Identify the process for an inter-hospital/facility transport of the trauma patient. Who provides in-transit advanced life support for patients involved in interfacility transports. How is this determined. What is the role of sending physicians in these transports.
7. Do you have air medical transport as part of your EMS system. If so, please outline air transport availability (rotor and fixed wing), response times, helipad locations and medical oversight for air medical transport.
8. If rotor wing services are part of your EMS systems please describe the number of scene calls, percentage of air medical transport rotor wing missions that are trauma and the number of trauma air medical cases last year.
9. What is the number of air transports that are fixed wing for trauma transports annually.
10. Please describe the air medical transport team configuration (i.e. paramedic-paramedic or paramedic-critical care RN or other, etc.).

Section II SITE SPECIFIC INFORMATION

A. General

1. Who is the designating provincial and/or regional health authority that designated you as a Trauma Centre.
2. Is there a resolution supporting the trauma centre accreditation by the hospital's governing body (if yes, please attach a copy).
3. Is there a medical staff/medical advisory committee resolution supporting accreditation of the trauma centre (if yes, please attach a copy).
4. Describe your hospital, including governance, its role in the community and trauma system, with applicable organizational charts. Clearly describe and demonstrate (with organization charts) how the trauma program fits within your institutions structure.
5. What is population served and geographic mandate for trauma by this site.
6. Number of funded hospital beds. Describe if multi-site facility.
7. Provide Hospital Annual report for last reporting year.
8. Are you responsible for pediatric major trauma within your system.

B. Trauma Data Management

1. Do you have a trauma registry.
2. Define the criteria for entry into your registry.
3. Describe the personnel who maintain the trauma registry and who collects the data. (How many FTE's, training and qualifications of staff).
4. How does your registry link to a regional/provincial/national registry.
5. Describe the registry reporting structure within the trauma program.
6. How is the registry integrated within the quality improvement initiatives of the trauma program.
7. Describe your policies for data access.
8. How does your registry link with other injury data surveillance programs.

9. List other forms of trauma data sources and how they are utilized.
10. How does your trauma registry support and contribute to research, and resource utilization.

C. Statistical Information from last reporting year

1. Number of ED visits for last reporting year

	Totals
# ED Visits	
# ED Injury Visits admitted	
# ED injury visits discharged	

2. Complete table below with all information for last reporting year where available

	ISS ≤ 12	ISS > 12	ISS > 15	Totals
Admissions				
Deaths <ul style="list-style-type: none"> • DOA • DIE • HOSP 				
TTA's				
Referrals/Transfers				

- Discharge Abstract Data (Minimal Data Set) may be needed if not captured by the trauma registry
- DIE – Died in Emergency
- TTA's – Trauma Team Activation
- DOA – Dead on arrival
- HOSP – death after admission
- Referrals/Transfers to and from another facility during acute phase of care

3. Major Trauma for last reporting year

(Major Trauma is defined as ISS > 12)

Major Trauma	Totals
# Major Trauma ICU admissions (Total from ED direct to ICU)	
# Major Trauma admitted to Ward excluding ICU that bypass the ED	
# Major Trauma admissions directly from ED to OR	

4. The primary admitting service for major trauma admissions

Admitting Service	# Major Trauma for last reporting year
Trauma Service	
ICU	
Orthopedics	
Neurosurgery	
General Surgery	
Urology	
Plastics/Burns	
Spine	
Vascular	

5. Major Blunt Trauma for last reporting year defined as ISS > 12

Blunt	Totals
# Blunt Traumas	
# Blunt Trauma deaths in ED	

6. Penetrating trauma for last reporting year

Penetrating	Any ISS	Deaths
# Admissions		
# Stab		
# GSW		
# Other		
Direct to OR		N/A
Direct to ICU		N/A

Section III TRAUMA PROGRAM

A. Describe your Trauma programs' administrative structure and funded support including;

1. Staff complements and office infrastructure; provide an organizational chart for Trauma Services.
2. Reporting relationships to the department of Surgery and other major hospital departments and services.
3. Trauma committee membership and terms of reference; sub-committees related to trauma including membership and terms of reference.

B. Medical Director of Trauma Service

1. Describe the role and authority to direct trauma service;
 - i. Regional authority
 - ii. Provincial authority
 - iii. Institutional authority
2. Is this a funded position (if yes, what is the percentage of FTE).
3. Copy of job description.
4. Copy of Curriculum Vitae.
5. CME in trauma for 3 years, including ATLS status if it is not included in your CV.

C. Trauma Coordinator and/or Manager

1. Narrative of the role and description of the position i.e. administration, clinical, educational, research, data. Description of reporting structure.
2. Is this a funded position (if yes, what is the percentage of FTE).
3. Copy of job description.
4. Copy of Curriculum Vitae.
5. Continuing trauma education for the last 3 years if it is not included in your CV.

D. Trauma Team Leaders

1. Narrative description of the hospital's trauma team/call roster for TTL's. Also include the general call schedule (example thereof) for general surgeons, neurosurgeons and orthopedic surgeons; including first and second call. Include any policy and procedure for appointment to and removal from trauma team leader call roster.
2. List all Trauma Team Leaders taking trauma call and for each indicate;
 - i. CME in trauma for 3 years (submit in evidence binder only)
 - ii. ATLS status
 - iii. Frequency of trauma calls per month
 - iv. Specialty training
3. Is there funding for Trauma Team Leaders.
4. Describe your Performance Evaluation of TTL.
5. Describe the use and access of FAST by the TTL's.

E. Trauma Team Activation Process

1. Narrative description of trauma team configuration and process for activations.
2. Definition of major trauma patient (activation criteria).
3. What is your compliance rate with TTA criteria.

F. Quality Management

(Please have all minutes from the last year, forms and documents available at the time of review for accreditors)

1. Describe your programs quality assurance, improvement initiatives, process and accountability.
2. Describe any completed or ongoing projects.
3. Describe your process for reviewing Trauma deaths.
4. Provide a list of quality indicators (describe audit process loop closure) (Examples from audit filters);
 - i. Time to OR for refractory hypotension
 - ii. Time to laparotomy
 - iii. Time to OR for craniotomy
 - iv. Time to OR for Open fracture
 - v. Delayed ED disposition
 - vi. Airway management for decreased GCS

5. Provide annual trauma program report for last reporting year.
6. Describe your feedback processes to referring sites.

Section IV HOSPITAL FACILITIES

A. Emergency Department (ED)

1. Define the role and relationship of emergency medicine to trauma service.
2. Describe the ED quality improvement/management processes for trauma.
3. Please define policies for direct trauma admissions that bypass ED if applicable.
4. Do you have Trauma Clinical Practice Guideline's/Protocols/Policies, list (attach copies in evidence binder).
5. Do you have any specific trauma documentation (example: standardized trauma patient care record, pre-printed orders) and flow sheets in your department (have them ready at the time of site visits during the QA review time).
6. Do you have continuing trauma education, provide a brief description;
 - i. Medical
 - ii. Nursing
 - iii. Allied Health
7. Do you have a policy for mandatory alcohol/drug screening and intervention on trauma patients.
8. What is the standard lab panel for Trauma Team Activations.
9. Who accompanies the major trauma patient to the CT department.
10. Is there social work support/crisis support for trauma services in the ED. Describe your role in a major trauma. Is this 24/7.
11. Attach your trauma team activation criteria

B. Diagnostic Imaging

1. Is there an in hospital, 24-hour plain film x-ray technician available (if no, please describe the availability and call back time expectation).
2. Is there a 24-hour CT scan technician available (if no, please describe in hours and/or on call rotation and call back time expectation).
3. Is there resuscitation and monitoring equipment available in the x-ray and CT scan department areas.
4. Do you have rapid access to plain films in your trauma bay. Please describe.
5. Describe your access to and utilization of interventional radiology.
6. Describe your local, regional, provincial radiology viewing system.
7. Describe the availability of staff Radiologist for timely interpretation of films.

C. Operating Room

1. Number of operating rooms.
2. Do you have an OR dedicated to trauma, for acute and for protected daytime use (example, plastics and orthopedics). (If yes, describe the policy for use. If no describe your policy for trauma case access).
3. Describe your trauma staffing and backup call for days, nights, weekend and holidays in hospital 24/7 for the following;
 - i. Anesthesiologist
 - ii. OR Nursing (or technicians)
4. Describe your continuing trauma education for OR nursing and allied staff.
5. Describe the policy for prioritization of Trauma/Emergency OR Cases and compliance with the policy.

D. Recovery Room/PACU

1. Please describe your hours of operation and your call back process if not open 24 hours a day, 7 days a week.
2. Describe your continuing trauma education for nursing.
3. Is the PACU used as ICU overflow for trauma patients and if so who is responsible for the management of the patient, and what is the rate of overflow.

E. Clinical Lab/Blood Bank

1. What is the turnaround time for Uncrossed, Crossed and Type specific Matched Blood.
2. Provide your massive blood transfusion protocol.
3. Describe any satellite blood banks in hospital.
4. Describe your uncross matched blood protocol.
5. Describe your 24-hour staffing availability in the Lab.
6. Describe your satellite sites for blood gas determination.

F. Critical Care

1. Describe the number of critical care beds and their configurations.
2. Are any ICU beds dedicated solely to trauma patients.
3. Do you have a no refusal policy for trauma patients to ICU, please describe.
4. What percentage of ICU admissions are trauma patients.
5. Describe your policy for and frequency of diversion of trauma patients due to unavailability of ICU/surgery beds.
6. Describe the role of your ICU within the regional/provincial trauma system.
7. Describe your physician coverage, including training and specialty.
8. Describe your ICU leadership and its advisory structure, including surgical representation.
9. Describe your management model for the trauma patient in the ICU. (i.e. closed, open, collaborative).
10. Describe your quality improvement process and how you link to the trauma program.
11. Describe your organ and tissue donation policies, including statistics for last 4 years.
12. List ICU practice guidelines/protocols for trauma patients (provide copies in the evidence binder).
13. Describe your critical care specialty training programs, including the relationship with the trauma program.
14. Describe your continuing trauma education in nursing, medical and allied health.

G. High Acuity/Intermediate/Step Down/Specialty Units (if applicable)

1. Describe your high acuity/intermediate care area available for the trauma patients, including nurse to patient ratio.
2. Describe admission/discharge criteria or applicable policies (documents available at time of site visit)
3. Describe the medical management model of this unit.
4. Describe quality assurance initiatives (i.e. ICU re-admissions).

H. Acute Care Wards

1. What is the process to determine the MRP (most responsible physician) for the trauma patient.
2. Is there a dedicated trauma ward. Describe the ward and medical management model. If there is no trauma ward, what is the default ward of admission for the trauma patient, are there dedicated trauma beds, and what is the medical management model for these trauma patients.
3. Describe your multidisciplinary team/allied services and team function for the trauma patient.
4. Describe your continuing trauma education for nursing and allied health.
5. Do you have any clinical practice guidelines/protocols/policies for trauma, please list them, and (provide copies at the time of visit).

Section V

SPECIALTY/REHABILITATION/SOCIAL SERVICES

A. Rehabilitation Services

1. Describe your leadership of Rehab Services.
2. Describe the role, relationship and access to both acute and long-term rehabilitation services for the trauma patient.
3. Describe your process for early/acute phase rehabilitation consultations for appropriate trauma patients.
4. Which of the following services are provided onsite for ICU, high acuity and trauma wards, and describe the working relationship with the trauma service. Physical Therapy, Occupational Therapy, Speech Therapy.
5. What are your average wait times for patients referred to rehab.
6. Describe any quality rehab initiatives related to trauma patients.

B. Pediatric Trauma (for all sites to answer)

1. Describe your case definition for major pediatric trauma patient.
2. What is the age limit for pediatric trauma in your hospital.

C. For Trauma Centres treating a mixture of adult & pediatric populations

1. What is the number of pediatric trauma admission during the year.
2. Is there a separate pediatric ICU.
3. Describe the medical management model for pediatric trauma patients in ED, ICU and on the general wards.
4. If applicable, describe transfer agreements for pediatric trauma patients.
5. If applicable, describe the relationship with the Pediatric Level I Trauma Care.
6. List practice guidelines/protocols for pediatric trauma.
7. Describe your quality improvement process for pediatric trauma. Describe your continuing pediatric trauma education for medical, nursing and allied health.

D. Burn Patients

1. Are you a designated Burn Centre, if yes go to question 3.
2. If not what is your transfer criteria and relationship with a designated Burn Centre. Number of patients admitted to your institution or transferred to other facilities with the last reporting year (go to next section).
3. Define the role and mandate of the Burn unit, provincial, regional and local.
4. Define your criteria for major burn and burn unit admission and transfer criteria if applicable.
5. Number of burn patients admitted during reporting year.
6. How many of those are major burn patients.
7. Describe your burn unit occupancy and diversion rates and policies.
8. Describe the medical management model of the critically ill burn patient.
9. Describe your transfer/triage policy for burns patients (attach policy).
10. Describe the relationship with the trauma program.
11. Describe your quality improvement process for burn patients.
12. Do you have a formal burn registry, if so please describe the registry, and process's related to the burn registry.

E. Spinal Cord Injury (SCI Program) Patients

1. Do you have a designated spinal cord injury program. If yes, go to question 3.
2. If not, what is your transfer criteria and relationship with a designated spinal cord injury centre. What is the number of SCI patients admitted to your institution and transferred to other facilities. (Once answered continue with section F)
3. Define your role and mandate of your spine unit, provincial, regional and local.
4. Number of spinal cord injury patients treated during reporting year.
5. Describe your occupancy rate.
6. Describe your transfer/triage policy for spinal cord injury patients.
7. Describe the relationship with trauma program.
8. Describe your quality improvement process for trauma/spine injuries.

9. Do you participate in the National Spinal Cord Registry, if so please describe the process's related to the spinal cord registry.

F. Social Work/Chaplaincy/Child Life/Psychology/Staff Support Systems

1. Describe the above support systems in place for trauma patients both inpatient and outpatient.
2. Describe counseling services for the family.
3. Describe how you manage patients with Post Traumatic Stress Disorder.
4. Describe the drug and alcohol intervention process for trauma patients.
5. Do you have a process for crisis intervention/debriefing for staff following major traumatic incidents.

Section VI

EDUCATIONAL ACTIVITIES/OUTREACH PROGRAMS

1. List the undergraduate and postgraduate training programs that interface with the trauma programs and describe their roles and interaction.
2. Do you have an ATLS program, and how many courses available per year.
3. List any other trauma educational programs or initiatives including;
 - i. Outreach programs for trauma care
 - ii. Regional and provincial rounds
 - iii. Pre-hospital care providers
4. Describe your access and utilization of simulation in trauma training.
5. List your patient education initiatives.

Section VII

INJURY CONTROL & PREVENTION

1. Describe your injury prevention program and initiatives within your trauma system. Please describe;
 - i. Regional, Provincial, National relationships/partnerships
 - ii. How do you use data to drive your injury prevention initiative
 - iii. Describe the evaluation process of your injury prevention programs
 - iv. Describe your Alcohol Screening and Intervention Program

Section VIII

RESEARCH ACTIVITIES

1. Describe your trauma research activities.
2. List your research program funding and infrastructure.
3. Describe your participation in research from a regional, provincial, national and international level.
4. List the last 3 years of trauma related research activity and publications.
5. How is the registry integrated within the research initiatives of the trauma program.

Section VIII

EMERGENCY PREPAREDNESS

1. Describe your trauma programs involvement in the institutions emergency preparedness program.
2. How does your program link with emergency preparedness program locally, regionally, provincially and nationally.
3. Describe any mock emergency preparedness exercises that you have been involved in the last 3 years.

APPENDIX E
Trauma System Accreditation Review
RECOMMENDED AGENDA TEMPLATE FOR SITE VISIT

(Note this is only a guide, please work in close liaison with designated TAC accreditation lead to meet system and site needs)

For planning purposes, the review will last at minimum of a one full day for Level I/II sites and a half day for Level III sites, with an estimated half day for the system review aspect depending on how integrated and formalized the trauma system is within your jurisdiction.

I. TRAUMA SYSTEM, OVERVIEW OF REGIONAL/PROVINCIAL SYSTEMS
(all sites combined if applicable, for all regional and system processes)
60-240 min

1. Organizations; Leadership, governance and mandate – 30 mins
2. Provincial/regional overview of program and outcome data
 - Presented by RD, TPM or TC – 30-60 mins
3. Pre-hospital; EMS, ground, air, communications, dispatch, and interfacility transfer
 - Interview leadership of above mentioned all in one team – 30-60 mins
4. Provincial/regional injury surveillance and performance improvement (Registry)
 - Registry Team – 30 mins
5. Regional and System Injury prevention – 30 mins
 - IP Team
6. Regional and system rehabilitation – 30 mins
 - Interview Medical Director, Manager of Rehab

SITE SPECIFIC FOR ALL REVIEWS

II. HOSPITAL TRAUMA SERVICE AND LEADERSHIP OVERVIEW **30-90 MIN**
(closed & separate meetings)

1. Hospital Trauma Service – 30 mins
 - Interview trauma director/medical manager, and trauma coordinator/manager
2. Hospital Leadership – 15 mins
 - Interview Hospital CEO/appropriate senior administrative leads.
3. Short hospital tour to follow the path of the trauma patient – max 30 min

- III. EMERGENCY DEPARTMENT** **30 MIN**
1. Interview Emergency Department Director and Emergency Department Manager, and/or allied health care professionals
- IV. RADIOLOGY/DIAGNOSTIC AND INTERVENTIONAL SERVICES** **15 MIN**
1. Interview director of medical imaging/interventional radiology and chief technologist, if regional services are done, please add to system day of visit.
- V. OPERATING ROOM/RECOVERY ROOM** **15 MIN**
1. Interview Manager or medical director and Chief Anesthesiologist Medical Director, and/or allied health care professionals
- VI. ICU** **30 MIN**
1. Interview Medical Director, and clinical manager, and/or allied health care professionals
- VII. INPATIENT UNITS** **15 MIN**
1. Clinical Managers and/or allied health care professionals
 2. If patients are on multiple units, all teams to be together in one meeting
- VIII. INTERVIEW LEADERS SUBSPECIALTIES SERVICES** **15 MIN**
(excluding trauma leadership if they are in these roles)
1. Neurosurgery
 2. Orthopedics
 3. Plastics (for Level I/li only)
 4. General Surgery
 5. Blood Services – this representative can be added to the ED section
 6. TTL's
 7. Others as necessary per site (i.e. Spine)

IX. QUALITY PROCESS REVIEW 60 MIN
(closed review with accreditation team only – over lunch)

1. Review Quality Assurance Process/Documents. Quality Improvement/Assurance
 - Minutes of trauma committee meetings for one-year prior
 - Quality improvement initiatives or programs relating to trauma for one year
2. Patient chart review (as per institutional policy): Trauma patient's charts will be requested to be available at the time of the review from the Trauma Registry. In this group of charts include all deaths to be determined preventable or potentially preventable, and deaths in patients TRISS score > 0.5 (excluding hip fractures) from previous 6 months. Supply other charts of your choice for review. (Maximum 30 charts in total).

X. REVIEW OF QA, PI PROCESS AND OUTCOMES 30 MIN

1. Discuss/review processes of care and outcome indicators and audit filters/flags with TD/TPM or TC, and other quality leaders as needed (registry) including Z, W and M statistics for:
 - Blunt
 - ISS > 12
 - ISS > 24
 - Penetrating
 - Pediatrics

XI. EXIT INTERVIEW AND CLOSING REMARKS 5-10 MIN

Trauma Program Leaders

Process will be reviewed and time for any last comments or questions. No decision regarding accreditation will be presented.

Accreditation written report will follow with recommendations within 8-10 weeks forwarded by the President of TAC. Review by the president will be completed and forwarded to the leaders who requested this process.

There will be Preliminary reports sent for review with RD/TPM or TC at 6-8 weeks for factual content only.

PLEASE NOTE

Trauma Leadership (TD, TPM, TC) are only to be involved in the interviews where they are listed as attendee's above. All other interviews are closed. The only exception to this is if the TPM/TC has multiple roles within their job description, i.e. injury prevention, registry etc. If this is the case, please arrange to cover all areas within one interview time slot (please increase the time as needed).

The accreditation visit schedule must be approved with the TAC Accreditation Team Leader designated for your site visit prior to the visit. This leader will help and assist you in the process and the planning of the day or days.

At any time during the day the accreditors have the ability to call back interviewees for further clarification or questions.

APPENDIX F Participant Feedback for the Accreditation

TAC Survey Date: _____

Names of survey team member(s): _____

Your name/site: _____

We hope that the TAC accreditation survey was a valuable experience, and as we are always striving for quality improvement we are asking you for your comments and input into the accreditation process. We look forward to your comments and/or suggestions for future accreditations.

We would like to ask you to provide feedback on the survey process and the qualities of the accreditation surveyors.

Your feedback will be collated. However names and other identifying information will be removed. Comments will be forwarded to the Trauma Association of Canada central office and to the surveyors.

Your feedback will assist TAC to maintain its high standards with respect to the quality of accreditation surveys. It will also help individual surveyors to assess their own strengths and weaknesses and plan their further professional development.

1. Sound knowledge of the Trauma Systems.

“Evidence of familiarity through:”

Ratings

Poor Fair Good Excellent Not Applicable

- discussion of current trends – both clinical and administrative;
- applying appropriate benchmarks to the organization and sharing knowledge of best practices.

2. Teamwork skills:

“Valued and demonstrated through commitment to team processes by:”

Ratings

Poor Fair Good Excellent Not Applicable

- participating as an equal member of the survey team;
- effectively facilitating team interviews, focus groups/debriefing and/or other activities.

3. Knowledgeable about TAC and its work:

Ratings

“Demonstrated a commitment to and understanding of work by:” Poor Fair Good Excellent Not Applicable

- advocating on behalf of TAC
- applying consistently and accurately
- TAC standards and processes to our organization;

4. Observation skills:

Ratings

“Ability to obtain high quality information by:” Poor Fair Good Excellent Not Applicable

- applying an effective range of data collection skills, including interviewing, probing, listening and paraphrasing;
- examining records, documentation etc.
- sensing/detecting underlying issues/problems.

5. Effective Communication Skills:

Ratings

“Demonstrated strong communication skills by:” Poor Fair Good Excellent Not Applicable

- showing tact and sensitivity;
- clearly explaining findings (balancing positive and negative):
- providing constructive and responsible feedback

6. Did the accreditation process provide you with sufficient time/information to meet with the surveyors and speak for your area of clinical involvement in the Trauma Program.

7. What would you say is this surveying teams' greatest strength.

8. In what area does this surveying team need to improve.

9. Would you accept this team back to your organization to conduct another survey.

- No Yes, with reservations Yes, without reservation

Comments:

10. Were the recommendations and final report helpful to further develop your program.

Name / Title: _____

Date: _____

Signature: _____

Thank you for your time.

Trauma Association of Canada Accreditation Executive

***On receipt of Accreditation Report, please return to:**

Trauma Association of Canada Central Office
c/o Regional Trauma Services
Foothills Medical Centre
Rm EG23, 1403-29th Street N.W.
Calgary, AB T2N 2T9

ACKNOWLEDGEMENTS

The Trauma Association of Canada Trauma System Accreditation Revised Guidelines were updated and revised by the Trauma Association of Canada Accreditation Committee.

The revised Guidelines were circulated in May 2011 to the TAC executive and formally accepted by the TAC executive on June 14, 2011.

Accreditation Committee and Ad Hoc Accreditation Working Group Members

Dr. John M Tallon, MD, MSc, FRCPC – President TAC

Ms. Tracey Taulu, RN, BSCN, MHS – Western Canada Co-Chair TAC Accreditation Committee

Dr. Richard Simons, MB, BChir, FRCS, FRCSC, FACS – Western Canada Co-Chair TAC Accreditation Committee

Ms. Paula Poirier, RN, BN, MN – Eastern Canada Co-Chair TAC Accreditation Committee

Dr. Fred Brenneman, MD, FRCSC, FACS – Eastern Co-Chair TAC Accreditation Committee

Dr. Tarek Razek, MD, FRCSC, FACS

Dr. Natalie Yanchar, MD, MSc, FRCSC

Dr. Sarvesh Logsetty, MD, FRCS (C), FACS

Dr. Graham Cleghorn, MD, FRCPC

Dr. Sandro Rizoli, MD, PhD, FRCSC, FACS

Thank you to all other TAC participants who provided input into this process.
Special thanks to Ms. Darlene Titus for her editing and formatting of this document.