

EXHIBIT 4

OAR Chapter 333, Divisions 200 and 205

OREGON TRAUMA HOSPITAL RESOURCE STANDARDS

Acronym Legend:

ATLS	Advance Trauma Life Support®	OPO	Organ Procurement Organization
CME	Continuing Medical Education	PACU	Post Anesthesia Care Unit
CRNA	Certified Nurse Anesthetist	PIPS	Performance Improvement & Patient Safety
CT	Computed Tomography	PGY	Post Graduate Year
ICU	Intensive Care Unit	TBI	Traumatic Brain Year
ISS	Injury Severity Score	TMD	Trauma Medical Director
MRI	Magnetic Resonance Imaging	TPM	Trauma Program Manager
NTDB	National Trauma Data Bank	TTA	Trauma Team Activation
NTDS	National Trauma Data Standard		

R = Required standard for the applicable category
 ■ = Standard not required

Tag	Standard/Chapter	Level	Level	Level	Level
		<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
TRAUMA SYSTEMS					
1-1	Active engagement of Trauma Center and their healthcare providers	R	R	R	R
1-2	Regional Trauma System engagement with standardization, implementation and performance improvement and patient safety (PIPS)	R	R	R	R
1-3	State and Regional Trauma System development and improvement	R	R	R	R
TRAUMA CENTER DESCRIPTION and THEIR ROLES IN A TRAUMA SYSTEM					
2-1	Trauma center must have an integrated, concurrent PIPS program to ensure optimal care and continuous improvement in care	R	R	R	R
2-2	Surgical commitment	R	R	R	■
2-3	Trauma centers must be able to provide the necessary human and physical resources (physical plant and equipment) to properly administer acute care consistent with their level of categorization	R	R	R	R
2-4	Trauma center must admit at least 1,200 trauma patients yearly or have 240 admissions with an Injury Severity Score (ISS) of more than 15	R	■	■	■
2-5	Through the trauma PIPS program and hospital policy, the trauma medical director (TMD) must have responsibility and authority for determining each general	R	R	R	■

	surgeon's ability to participate on the trauma panel based on an annual review				
2-6-1	Qualified attending surgeons must participate in major therapeutic decisions, be present in the emergency department for major resuscitations, be present at operative procedures, and be actively involved in the critical care of all seriously injured patients	R	R		
2-6-2	A resident in postgraduate year 4 or 5 or an attending emergency physician who is part of the trauma team may be approved to begin resuscitation while awaiting the arrival of the attending surgeon but cannot independently fulfill the responsibilities of, or substitute for, the attending surgeon	R	R		
2-7	The presence of such a resident or attending emergency physician may allow the attending surgeon to take call from outside the hospital. In this case, local criteria and a PIPS program must be established to define conditions requiring the attending surgeon's immediate hospital presence	R	R		
2-8-1	It is expected that the surgeon will be in the emergency department on patient arrival, with adequate notification from the field. The maximum acceptable response time for the highest-level activation tracked from patient arrival for Level I and II trauma centers is 15 minutes, and 30 minutes for Level III trauma centers. The program must demonstrate that the surgeon's presence is in compliance at least 80 percent of the time	R	R	R	
2-8-2	It is expected that the physician (if available) or midlevel provider will be in the emergency department on patient arrival, with adequate notification from the field. The maximum acceptable response time is 30 minutes for the highest level of activation, tracked from patient arrival. The PIPS program must demonstrate that the physician's (if available) or midlevel provider's presence is in compliance at least 80 percent of the time				R
2-9	The attending surgeon's immediate (within 15 minutes) arrival for patients with appropriate activation criteria must be monitored by the hospital's trauma PIPS program	R	R		
2-10	The trauma surgeon on call must be dedicated to a single trauma center while on duty	R	R		
2-11	A published backup call schedule for trauma surgery must be available	R	R		
2-12	Continuous general surgical coverage			R	
2-13-1	Well-defined transfer plans are essential			R	R
2-13-2	Collaborative treatment and transfer guidelines reflecting the Level IV facilities' capabilities must be developed and				R

	regularly reviewed, with input from higher-level trauma centers in the region				
2-14	24-hour emergency coverage by a physician or midlevel provider				R
2-15	The emergency department must be continuously available for resuscitation with coverage by a registered nurse and physician or midlevel provider, and it must have a physician director				R
2-16	Emergency department providers that are not board certified in emergency medicine must maintain current Advanced Trauma Life Support® (ATLS®) certification as part of their competencies in trauma				R
2-17	There is a TMD and trauma program manager (TPM) knowledgeable and involved in trauma care that work together with guidance from the trauma peer review committee to identify events, develop corrective action plans, and ensure methods of monitoring, reevaluation, and benchmarking.	R	R	R	R
2-18	Multidisciplinary trauma peer review committee must meet regularly, with required attendance of medical staff active in trauma resuscitation, to review systemic and care provider issues, as well as propose improvements to the care of the injured	R	R	R	R
2-19	PIPS program must have audit filters to review and improve pediatric and adult patient care	R	R	R	R
2-20	Because of the greater need for collaboration with receiving trauma centers, trauma center must actively participate in regional or statewide trauma system meetings and committees that provide oversight				R
2-21	Trauma center must be the local trauma authority and participate in the provision of training for prehospital and hospital-based providers				R
2-22	Facility must participate in regional disaster management plans and exercises	R	R	R	R
2-23	Any adult trauma center that annually admits to the hospital 100 or more injured children younger than 15 years must fulfill the following additional criteria demonstrating their capability to care for injured children: trauma surgeons must be credentialed for pediatric trauma care by the hospital's credentialing body	R	R	R	
2-24	There must be a pediatric emergency department area, a pediatric intensive care area, appropriate resuscitation equipment, and a pediatric-specific trauma PIPS program	R	R	R	
2-25	For adult trauma centers annually admitting to the hospital fewer than 100 injured children younger than 15 years, these resources are desirable. These hospitals,	R	R	R	

	however, must review the care of their injured children through their PIPS program				
PREHOSPITAL TRAUMA CARE					
3-1	The trauma program must participate in the training of prehospital personnel, the development and improvement of prehospital care protocols, and PIPS programs	R	R	R	R
3-2	The protocols that guide prehospital trauma care must be established by the trauma health care team, including surgeons, emergency physicians, medical directors for EMS agencies, and basic and advanced prehospital personnel	R	R	R	R
3-3	Rigorous multidisciplinary performance improvement is essential to evaluate overtriage and undertriage rates to attain the optimal goal of less than 5 percent undertriage	R	R	R	
3-4	The TMD must be involved in the development of the trauma center's bypass (diversion) protocol	R	R	R	
3-5	The trauma surgeon must be involved in the decision regarding bypass (diversion) each time the center goes on bypass	R	R	R	
3-6	The trauma center must not be on bypass (diversion) more than 5 percent of the time	R	R	R	
3-7	When a trauma center is required to go on bypass or to divert, the center must have a system to notify dispatch and EMS agencies. The center must do the following: <ul style="list-style-type: none"> • Prearrange alternative destinations with transfer agreements in place; • Notify other centers of divert or advisory status; - Maintain a divert log; and • Subject all diverts and advisories to performance improvement procedures 	R	R	R	R
INTERHOSPITAL TRANSFERS					
4-1	Direct physician-to-physician contact is essential	R	R	R	R
4-2	The decision to transfer an injured patient to a specialty care facility in an acute situation must be based solely on the needs of the patient and not on the requirements of the patient's specific provider network (for example, a health maintenance organization or a preferred provider organization) or the patient's ability to pay	R	R	R	
4-3-1	A very important aspect of interhospital transfer is an effective PIPS program that includes evaluating transport activities	R	R	R	R
4-3-2	Perform a PIPS review of all transfers out	R	R	R	R
HOSPITAL ORGANIZATION and the TRAUMA PROGRAM					

5-1-1	A decision by a hospital to become a trauma center requires the commitment of the institutional governing body and the medical staff	R	R	R	R
5-1-2	Documentation of administrative commitment is required from the governing body and the medical staff	R	R	R	R
5-2	This [administrative] support must be reaffirmed continually (every 3 years) and must be current at the time of categorization	R	R	R	R
5-3	The [medical staff] support must be reaffirmed continually (every 3 years) and must be current at the time of categorization	R	R	R	R
5-4	The trauma program must involve multiple disciplines and transcend normal departmental hierarchies	R	R	R	
5-5-1	The TMD must be a current board-certified general surgeon (or a general surgeon eligible for certification by the American Board of Surgery according to current requirements) or a general surgeon who is an American College of Surgeons Fellow with a special interest in trauma care and must participate in trauma call	R	R	R	
5-5-2	TMD is a physician practicing emergency medicine, responsible for coordinating the care of injured patients, verifies continuing medical education of personnel, and has oversight of the trauma quality improvement process. The TMD is clinically involved with trauma patient management and responsible for credentialing of trauma team members.				R
5-6	The TMD must be current in ATLS®	R	R	R	R
5-7	The TMD must maintain an appropriate level of trauma-related extramural continuing medical education (16 hours annually, or 48 hours in 3 years)	R	R		
5-8	Membership and active participation in regional or national trauma organizations are essential for the TMD in Level I and II trauma centers and are desirable for TMDs in Level III and IV facilities	R	R		
5-9	The TMD must have the authority to manage all aspects of trauma care	R	R	R	
5-10	The TMD must chair and attend a minimum of 50% of the multidisciplinary trauma peer review committee meetings.	R	R	R	
5-11-1	The TMD, in collaboration with TPM, must have the authority to correct deficiencies in trauma care and exclude from trauma call the trauma team members who do not meet specified criteria	R	R	R	
5-11-2	In addition, the TMD must perform an annual assessment of the trauma panel providers in the form of Ongoing Professional Practice Evaluation (OPPE) and Focused	R	R	R	

	Professional Practice Evaluation (FPPE) when indicated by findings of the PIPS process				
5-12	The TMD must have the responsibility and authority to ensure compliance with the above requirements and cannot direct more than one trauma center	R	R	R	
5-13	The criteria for a graded activation must be clearly defined by the trauma center, with the highest level of activation including the six required criteria listed in Exhibit 3.	R	R	R	R
5-14	Trauma centers highest level of activation requires the response of the full trauma team within 15 minutes of arrival of the patient, and the criteria should include physiologic criteria and some or several of the anatomic criteria	R	R		
5-15	Trauma centers team must be fully assembled within 30 minutes			R	R
5-16-1	Other potential criteria for trauma team activation that have been determined by the trauma program to be included in the various levels of trauma activation must be evaluated on an ongoing basis in the PIPS process to determine their positive predictive value in identifying patients who require the resources of the full trauma team.	R	R	R	R
5-16-2	The emergency physician may initially evaluate the limited-tier trauma patient, but the center must have a clearly defined response expectation for the trauma surgical evaluation of those patients requiring admission	R	R	R	
5-17-1	Seriously injured patients must be admitted to, or evaluated by, an identifiable surgical service staffed by credentialed trauma providers	R	R		
5-17-2	Injured patients may be admitted to individual surgeons, but the structure of the program must allow the TMD to have oversight authority for the care of these patients.			R	
5-18	Programs that admit more than 10% of injured patients to non-surgical services must review all non-surgical admissions through the trauma PIPS process	R	R	R	
5-19	Sufficient infrastructure and support to ensure adequate provision of care must be provided for this service	R	R		
5-20	In teaching facilities, the requirements of the residency review committees must be met	R	R		
5-21	There must be a method to identify the injured patients, monitor the provision of health care services, make periodic rounds, and hold formal and informal discussions with individual practitioners			R	
5-22	In addition to administrative ability, the TPM must show evidence of educational preparation and clinical experience in the care of injured patients	R	R	R	

5-23-1	There must be a minimum of 1.0 FTE TPM or Trauma Coordinator dedicated to the trauma program for trauma centers with ≥ 250 patients per year	R	R	R	R
5-23-2	A proportionate FTE Trauma Coordinator must be employed for trauma centers with < 250 patients per year			R	R
5-24-1	The TPM or Trauma Coordinator must show evidence of educational preparation, with a minimum of 16 hours per year (internal or external) of trauma-related continuing education and clinical experience in the care of injured patients	R	R	R	
5-24-2	The Trauma Coordinator must show evidence of educational preparation with a minimum of 4 hours per year (internal or external) of trauma-related continuing education and has completed an accredited course in the care of trauma patients				R
5-25	The trauma center's PIPS program must have a multidisciplinary trauma peer review committee chaired by the TMD	R	R	R	
CLINICAL FUNCTIONS – GENERAL SURGERY					
6-1	General surgeons caring for trauma patients must meet certain requirements, as described herein. These requirements may be considered to be in four categories: current board certification, clinical involvement, PIPS, and education.	R	R	R	
6-2	Board certification or eligible for certification by the American Board of Surgery according to current requirements or the alternate pathway as described by the American College of Surgeons (ACS) is essential for general surgeons who take trauma call.	R	R	R	
6-3	Non-board certified surgeons meet alternate criteria as described by ACS	R	R	R	
6-4	Trauma surgeons must have privileges in general surgery	R	R	R	
6-5	The trauma surgeon on call must be dedicated to a single trauma center while on duty	R	R		
6-6-1	A published backup call schedule for trauma surgery must be available	R	R		
6-6-2	Maximum acceptable response time is 15 minutes for Level I and Level II; 30 minutes for Level III and Level IV. Response time is tracked from patient arrival rather than from notification or activation. 80% attendance threshold must be met for highest level of activation.	R	R	R	R
6-7-1	The attending surgeon is expected to be present in the operating room for all operations. A mechanism for documenting this presence is essential	R	R	R	
6-7-2	There must be a multidisciplinary trauma peer review committee chaired by the TMD with representatives	R	R	R	

	from: general surgery, orthopedic surgery, emergency medicine, ICU, and anesthesia – and for Level I and Level II trauma centers, neurosurgery and radiology. Liaisons from orthopedic surgery, emergency medicine, ICU, anesthesiology, neurosurgery, and radiology must attend a minimum of 50% of the meetings with appropriate documentation.				
6-8	Each member of the group of general surgeons must attend at least 50 percent of the multidisciplinary trauma peer review committee meetings	R	R	R	
6-9-1	All general surgeons on the trauma team must have successfully completed the ATLS® course at least once	R	R	R	R
6-9-2	The TMD must accrue an average of 16 hours annually or 48 hours in 3 years of verifiable external trauma-related CME	R	R		
6-10-1	Other general surgeons who take trauma call must be knowledgeable and current in the care of injured patients. This requirement must be met by the acquisition of 16 hours of trauma-related CME per year on average or by demonstrating participation in an internal educational process conducted by the trauma program based on the principles of practice-based learning and the PIPS program.	R	R	R	
6-10-2	General surgeons in a Level IV trauma hospital who take trauma call must be knowledgeable and current in the care of injured patients. This requirement must be met by the acquisition of 8 hours of trauma-related CME per year on average or by demonstrating participation in an internal educational process conducted by the trauma program based on the principles of practice-based learning and the PIPS program.				R
CLINICAL FUNCTIONS – EMERGENCY MEDICINE					
7-1-1	The emergency department must have a designated emergency physician director supported by an appropriate number of additional physicians to ensure immediate care for injured patients	R	R	R	
7-1-2	The emergency department must have a designated emergency physician director supported by an appropriate number of additional providers to ensure immediate care for injured patients				R
7-2	An emergency physician must be present in the department at all times	R	R		
7-3	Occasionally, it is necessary for the physician to leave the emergency department for short periods to address in-house emergencies. Such cases and their frequency must be reviewed by the PIPS program to ensure that this			R	

	practice does not adversely affect the care of patients in the emergency department				
7-4	In institutions in which there are emergency medicine residency training programs, supervision must be provided by an in-house attending emergency physician 24 hours per day	R	R	R	
7-5	These roles and responsibilities must be defined, agreed on, and approved by the TMD	R	R	R	
7-6-1	Board certification or eligibility for certification by the appropriate emergency medicine board according to current requirements or the alternate pathway is essential for physicians staffing the emergency department and caring for trauma patients	R	R	R	
7-6-2	Non-board certified emergency medicine physicians meet alternate criteria as described by ACS	R	R	R	
7-7	Emergency physicians on the call panel must be regularly involved in the care of injured patients	R	R	R	
7-8	A representative from the emergency department must participate in the prehospital PIPS program	R	R	R	
7-9	A designated emergency physician liaison must be available to the TMD for PIPS issues that occur in the emergency department	R	R	R	
7-10	Emergency physicians must participate actively in the overall trauma PIPS program and the multidisciplinary trauma peer review committee	R	R	R	
7-11	The emergency medicine liaison on the multidisciplinary trauma peer review committee must attend a minimum of 50 percent of the committee meetings	R	R	R	
7-12	The liaison from emergency medicine must accrue an average of 16 hours annually or 48 hours in 3 years of verifiable external trauma-related CME	R	R		
7-13-1	Other emergency physicians who participate on the trauma team also must be knowledgeable and current in the care of injured patients. This requirement may be met by documenting the acquisition of 16 hours of trauma-related CME per year on average or by demonstrating participation in an internal educational process conducted by the trauma program based on the principles of practice-based learning and the PIPS program.	R	R	R	
7-13-2	Emergency physicians in Level IV trauma hospital who participate on the trauma team also must be knowledgeable and current in the care of injured patients. This requirement may be met by documenting the acquisition of 8 hours of trauma-related CME per year on average or by demonstrating participation in an internal educational process conducted by the trauma				R

	program based on the principles of practice-based learning and the PIPS program.				
7-14	All board-certified emergency physicians or those eligible for certification by an appropriate emergency medicine board according to current requirements must have successfully completed the ATLS course at least once	R	R	R	R
7-15	Physicians who are certified by boards other than emergency medicine who treat trauma patients in the emergency department are required to have current ATLS status	R	R	R	R
CLINICAL FUNCTIONS – NEUROSURGERY					
8-1	Neurotrauma is organized and led by a highly experienced and devoted neurosurgeon. If this surgeon is not the director of the neurosurgery service, a neurologic surgeon liaison must be designated	R	R		
8-2	Neurotrauma care must be continuously available for all TBI and spinal cord injury patients and must be present and respond within 30 minutes based on institutional-specific criteria	R	R		
8-3	A reliable, published neurotrauma call schedule must be provided with formally arranged contingency plans in case the capability of the neurosurgeon, hospital, or system to care for neurotrauma patients is overwhelmed	R	R		
8-4	The center must have a predefined and thoroughly developed neurotrauma diversion plan that is implemented when the neurosurgeon on call becomes encumbered. A predefined, thoroughly developed neurotrauma diversion plan must include the following: <ul style="list-style-type: none"> • Emergency medical services notification of neurosurgery advisory status/diversion; • A thorough review of each instance by the PIPS program; and • Monitoring of the efficacy of the process by the PIPS program 	R	R		
8-5	A formal, published contingency plan must be in place for times in which a neurosurgeon is encumbered upon the arrival of a neurotrauma case. The contingency plan must include the following: <ul style="list-style-type: none"> • A credentialing process to allow the trauma surgeon to provide initial evaluation and stabilization of the neurotrauma patient; • Transfer agreements with a similar or higher-level verified trauma center; • Direct contact with the accepting facility to arrange for expeditious transfer or ongoing monitoring support; and 	R	R	R	

	<ul style="list-style-type: none"> Monitoring of the efficacy of the process by the PIPS program. 				
8-6-1	If one neurosurgeon covers two centers within the same limited geographic area, there must be a published backup schedule	R	R	R	
8-6-2	The performance improvement process must demonstrate that appropriate and timely care is provided	R	R	R	
8-7	There must be a plan approved by the TMD that determines which types of neurosurgical injuries may remain and which should be transferred			R	
8-8	Transfer agreements must exist with appropriate Level I and Level II trauma centers			R	
8-9	In all cases, whether patients are admitted or transferred, the care must be timely, appropriate, and monitored by the PIPS program			R	
8-10-1	Board certification or eligibility for certification by an appropriate neurosurgical board according to the current requirements or the alternate pathway is essential for neurosurgeons who take trauma call	R	R	R	
8-10-2	Alternate Criteria for Non-Board Certified Neurosurgeons	R	R	R	
8-11	Qualified neurosurgeons should be regularly involved in the care of patients with head and spinal cord injuries and must be credentialed by the hospital with general neurosurgical privileges	R	R		
8-12	The neurosurgery service must participate actively in the overall trauma PIPS program	R	R		
8-13-1	The neurosurgery liaison on the multidisciplinary trauma peer review committee must attend a minimum of 50 percent of the committee's meetings	R	R		
8-13-2	Centers with any emergent neurosurgical cases must also have the participation of neurosurgery on the multidisciplinary trauma peer review committee			R	
8-14	The liaison representative from neurosurgery must accrue an average of 16 hours annually or 48 hours in 3 years of verifiable external trauma-related CME	R	R		
8-15-1	Other neurosurgeons participating in trauma call also must be knowledgeable and current in the care of injured patients. This requirement may be documented by the acquisition of 16 hours of trauma-related CME per year on average or through an internal educational process conducted by the trauma program and the neurosurgical liaison based on the principles of practice-based learning and the PIPS program	R	R		
8-15-2	If a Level III trauma hospital is providing this service, other neurosurgeons participating in trauma call also			R	

	must be knowledgeable and current in the care of injured patients. This requirement may be documented by the acquisition of 16 hours of trauma-related CME per year on average or through an internal educational process conducted by the trauma program and the neurosurgical liaison based on the principles of practice-based learning and the PIPS program				
8-15-3	If a Level IV trauma hospital is providing this service, other neurosurgeons participating in trauma call also must be knowledgeable and current in the care of injured patients. This requirement may be documented by the acquisition of 8 hours of trauma-related CME per year on average or through an internal educational process conducted by the trauma program and the neurosurgical liaison based on the principles of practice-based learning and the PIPS program				R
CLINICAL FUNCTIONS – ORTHOPEDIC SURGERY					
9-1	Because of their skills and training in the management of the acute and rehabilitation phases of musculoskeletal trauma, physical and occupational therapists and rehabilitation specialists are essential	R	R		
9-2	Operating rooms must be promptly available to allow for emergency operations on musculoskeletal injuries, such as open fracture debridement and stabilization, external fixator placement, and compartment decompression	R	R	R	
9-3	A system must be organized so that musculoskeletal trauma cases can be scheduled without undue delay and not at inappropriate hours that might conflict with more urgent surgery or other elective procedures	R	R		
9-4	There must be an orthopaedic surgeon who is identified as the liaison to the trauma program	R	R	R	
9-5-1	Orthopaedic care must be overseen by an individual who has completed a fellowship in orthopaedic traumatology approved by the Orthopaedic Trauma Association (OTA)	R			
9-5-2	In a pediatric trauma center this requirement may be met by having formal transfer agreements that specify which cases will be transferred for high level orthopaedic oversight and assuring that all such transfers (or potential transfers) are reviewed as part of the performance improvement process.				
9-6	Orthopaedic team members must have dedicated call at their institution or have an effective backup call system	R	R		
9-7	Orthopaedic team members must be available in the trauma resuscitation area within 30 minutes after consultation has been requested by the surgical trauma	R	R		


	team leader for multiply injured patients based on institution-specific criteria.				
9-8	The performance improvement process must ensure that care is timely and appropriate	R	R		
9-9	If the on-call orthopaedic surgeon is unable to respond promptly, a backup consultant on-call surgeon must be available	R	R		
9-10-1	The design of this system is the responsibility of the orthopaedic trauma liaison but must be approved by the TMD	R	R		
9-10-2	All necessary resources for modern musculoskeletal trauma care must be provided including instruments, equipment, and personnel, along with readily available operating rooms for musculoskeletal trauma procedures	R	R		
9-11	An orthopaedic surgeon must be on call and promptly available 24 hours a day			R	
9-12	If the orthopaedic surgeon is not dedicated to a single facility while on call, then a published backup schedule is required			R	
9-13	The PIPS process must review the appropriateness of the decision to transfer or retain major orthopaedic trauma cases			R	
9-14	There must be protocols for the following orthopaedic emergencies: 1) the type and severity of pelvic and acetabular fractures that will be treated at the institutions as well as those that will be transferred out for care; 2) the timing and sequence for the treatment of long bone fractures in multiply injured patients; and 3) the wash out time for open fractures. These protocols must be included as part of the PIPS process	R	R		
9-15	The orthopaedic service must participate actively with the overall trauma PIPS program and the multidisciplinary trauma peer review committee	R	R	R	
9-16	The orthopaedic liaison to the trauma PIPS program must attend a minimum of 50 percent of the multidisciplinary trauma peer review committee meetings	R	R	R	
9-17-1	Board certification or eligibility for certification by an appropriate orthopaedic board according to the current requirements, or the alternate pathway is essential for orthopaedic surgeons who take trauma call	R	R	R	
9-17-2	Alternate Criteria for Non- Board Certified Orthopaedic Surgeons	R	R	R	
9-18	The orthopaedic surgical liaison to the trauma program must accrue an average of 16 hours annually or 48 hours in 3 years of verifiable external trauma-related CME	R	R		

9-19-1	Other members of the orthopaedic trauma team must be knowledgeable about and current in the care of injured patients. This requirement may be documented by the acquisition of 16 hours of trauma-related CME per year on average or through an internal educational process conducted by the trauma program and the orthopaedic liaison based on the principles of practice-based learning and the PIPS program	R	R	R	
9-19-2	If a Level IV trauma hospital provides this service, other members of the orthopaedic trauma team must be knowledgeable about and current in the care of injured patients. This requirement may be documented by the acquisition of 8 hours of trauma-related CME per year on average or through an internal educational process conducted by the trauma program and the orthopaedic liaison based on the principles of practice-based learning and the PIPS program				R
PEDIATRIC TRAUMA CARE					
Trauma hospitals seeking categorization as a Level I or Level II Pediatric Trauma Center shall meet the following pediatric trauma care standards.					
10-1-1	Hospitals that pursue categorization as pediatric trauma centers must meet the same resource requirements as adult trauma centers, in addition to pediatric resource requirements.	R	R		
10-1-2	A Level I pediatric trauma center must annually admit 200 or more injured children younger than 15 years	R			
10-2	A Level II pediatric trauma center must annually admit 100 or more injured children younger than 15 years		R		
10-3	All Level I and II pediatric trauma centers must have a dedicated pediatric trauma program manager	R	R		
10-4	All Level I and II pediatric trauma centers must have a pediatric trauma registrar	R	R		
10-5	In a Level I pediatric trauma center, the pediatric trauma program manager must be a full-time position dedicated to the pediatric trauma service	R			
10-6	All pediatric trauma centers must have a pediatric trauma performance improvement and patient safety (PIPS) program	R	R		
10-7	In addition, all pediatric trauma centers must have the following programs: pediatric rehabilitation, child life and family support programs, pediatric social work, child protective services, pediatric injury prevention, community outreach, and education of health	R	R		

	professionals and the general public in the care of pediatric trauma patients				
10-8	Level I and II pediatric trauma centers must have a mechanism in place to assess children for maltreatment	R	R		
10-9	Level I pediatric trauma centers must have identifiable pediatric trauma research	R			
10-10	The pediatric Level I center's research requirement is equivalent to that of adult Level I trauma centers	R			
10-11	In combined Level I adult and pediatric centers, half of the research requirement must be pediatric research	R			
10-12	A Level I pediatric trauma center must have at least two surgeons who are board certified or eligible for certification by the American Board of Surgery according to current requirements in pediatric surgery	R			
10-13	On staff, there must be one board-certified surgeon or one surgeon eligible for certification by an appropriate orthopaedic board according to the current requirements of that board who also has had pediatric fellowship training	R			
10-14	Additionally, there must be on staff at least one board-certified surgeon or one surgeon eligible for certification by an appropriate neurosurgical board according to current requirements of that board who also has had pediatric fellowship training	R			
10-15	There must be one additional board-certified orthopaedic surgeon or surgeon eligible for certification by an appropriate orthopaedic board according to the current requirements of that board, who is identified with demonstrated interests and skills in pediatric trauma care	R			
10-16	There must be one additional board-certified neurosurgeon or surgeon eligible for certification by an appropriate neurosurgical board according to the current requirements of that board, who is identified with demonstrated interests and skills in pediatric trauma care	R			
10-17	There must be two physicians who are board certified or eligible for certification in pediatric critical care medicine, according to current requirements in pediatric critical care medicine: or in pediatric surgery and surgical critical care by the American Board of Surgery	R			
10-18	There must be two physicians who are board certified or eligible for certification by an appropriate emergency medicine board according to current requirements in pediatric emergency medicine	R			
10-19	The pediatric intensive care unit must be staffed by individuals credentialed by the hospital to provide pediatric trauma care in their respective areas	R	R		

10-20	The pediatric section of the emergency department must be staffed by individuals credentialed by the hospital to provide pediatric trauma care in their respective areas	R	R		
10-21	In a Level II pediatric trauma center, there must be at least one pediatric surgeon who is board-certified or eligible for certification by the American Board of Surgery according to current requirements in pediatric surgeon		R		
10-22	There must be one surgeon who is board-certified or eligible for certification by an appropriate orthopaedic board identified with demonstrated interests and skills in pediatric trauma care		R		
10-23	There must be one surgeon who is board-certified or eligible for certification by an appropriate neurosurgical board identified with demonstrated interests and skills in pediatric trauma care		R		
10-24	In a Level I pediatric trauma center, the pediatric trauma medical director must be board certified or eligible for certification by the American Board of Surgery according to current requirements for pediatric surgery or alternatively, a pediatric surgeon who is a Fellow of the American College of Surgeons with a special interest in pediatric trauma care, and must participate in trauma call	R			
10-25	In a Level II pediatric trauma center, the pediatric trauma medical director should be a board-certified pediatric surgeon or a surgeon eligible for certification by the American Board of Surgery according to current requirements for pediatric surgeons. This individual must be a board-certified general surgeon or a general surgeon eligible for certification by the American Board of Surgery according to current requirements qualified to serve on the pediatric trauma team as defined in the following paragraph		R		
10-26	When the number of pediatric surgeons on staff is too few to sustain the pediatric trauma panel, general surgeons who are board certified or eligible for certification by the American Board of Surgery according to current requirements may serve on the pediatric trauma team. In this circumstance, they must be credentialed by the hospital to provide pediatric trauma care, be members of the adult trauma panel, and be approved by the pediatric trauma medical director	R	R		
10-27	At a minimum, a Level I pediatric trauma center must have continuous rotations in trauma surgery for senior residents (Clinical PGY 3–5) who are part of an Accreditation Council for Graduate Medical Education–accredited program	R			

10-28	At a minimum, these rotations should include residency programs in all the following specialties: general surgery, orthopaedic surgery, emergency medicine, and neurosurgery. They may also include support of a pediatric surgical fellowship	R			
10-29	In Level I and II pediatric trauma centers, other specialists (in anesthesiology, neurosurgery, orthopaedic surgery, emergency medicine, radiology, and rehabilitation) providing care to injured children who are not pediatric-trained providers also should have sufficient training and experience in pediatric trauma care and be knowledgeable about current management of pediatric trauma in their specialty. The program must make specialty-specific pediatric education available for these specialists	R	R		
10-30	An organized pediatric trauma service led by a pediatric trauma medical director must be present in Level I and II pediatric trauma centers	R	R		
10-31	The pediatric trauma service must maintain oversight of the patient's management while the patient is in the intensive care unit	R	R		
10-32	The trauma service should work collaboratively with the pediatric critical care providers, although all significant therapeutic decisions must be approved by the trauma service, and the service must be made aware of all significant clinical changes	R	R		
10-33	The surgical director of the pediatric intensive care unit must participate actively in the administration of the unit, as evidenced by the development of pathways and protocols for care of surgical patients in the intensive care unit and in unit-based performance improvement and should be board-certified in surgical critical care	R	R		
10-34-1	Pediatric surgeons or trauma surgeons with pediatric privileges must be included in all aspects of the care of injured children admitted to an intensive care unit	R	R		
10-34-2	Any adult trauma center that annually admits 100 or more injured children younger than 15 years must fulfill the following additional criteria demonstrating its capability to care for the injured child	R	R		
10-34-3	The trauma surgeons must be credentialed for pediatric trauma care by the hospital's credentialing body	R	R		
10-34-4	There must be a pediatric emergency department area, a pediatric intensive care area, appropriate resuscitation equipment, and a pediatric-specific trauma PIPS program	R	R		
10-34-5	For adult trauma centers admitting fewer than 100 injured children younger than 15 years per year, these resources are desirable. These hospitals, however, must	R	R		

	review the care of all injured children through their PIPS programs				
10-35	Level I and II pediatric trauma centers must submit data to the National Trauma Data Bank® (NTDB®)	R	R		
10-36	There must be a trauma peer review committee chaired by the pediatric trauma medical director with participation by the pediatric /general surgeons and liaisons from pediatric/general surgery, orthopaedic surgery, neurosurgery, emergency medicine, pediatric critical care medicine, anesthesia, and radiology to improve trauma care by reviewing selected deaths, complications, and sentinel events with the objectives of identification of issues and appropriate responses	R	R		
10-37	The aforementioned representatives must attend at least 50% of the trauma peer review meetings, and their attendance must be documented	R	R		
10-38	All pediatric and general surgeons on the pediatric trauma panel treating children must attend at least 50% of the trauma peer review meetings	R	R		
10-39	In Level I and II pediatric trauma centers, the pediatric trauma medical director and the liaisons from neurosurgery, orthopaedic surgery, emergency medicine, and critical care medicine must each accrue an average of 16 hours annually or 48 hours in 3 years of verifiable external CME, of which at least 12 hours (in 3 years) must be related to clinical pediatric trauma care	R	R		
10-40	The other general surgeons, orthopaedic surgeons, neurosurgeons, emergency medicine physicians, and critical medicine care physicians who take trauma call in Level I and II pediatric trauma centers also must be knowledgeable and current in the care of injured patients. This requirement may be met by documenting the acquisition of 16 hours of CME per year on average or by demonstrating participation in an internal educational process conducted by the trauma program based on the principles of practice-based learning and the PIPS program	R	R		
COLLABORATIVE CLINICAL SERVICES					
For purposes of the following collaborative clinical service standards, a Level IV trauma center shall meet the prescribed standard if the Level IV provides the service. This is noted by the following symbol: 					
11-1	Consults for anesthesiology services are critical in the management of severely injured patients and must be	R	R	R	R

	available within 30 minutes from notification for emergency operations				
11-2-1	Consults for anesthesiology services are critical in the management of severely injured patients and must be available within 30 minutes from notification for managing airway problems	R	R	R	R
11-2-2	Anesthesiology services must be present at full team activation within 15 minutes from patient arrival when requested by a physician or an advanced practitioner directing the trauma.	R	R		
11-2-3	Anesthesiology services must be present at full team activation within 30 minutes from patient arrival when requested by a physician or an advanced practitioner directing the trauma.			R	R
11-3-1	The anesthetic care of injured patients must be organized and supervised by an anesthesiologist who is highly experienced and committed to the care of injured patients and who serves as the designated liaison to the trauma program	R	R		
11-3-2	A qualified and dedicated physician anesthesiologist must be designated as the liaison to the trauma program	R	R		
11-3-3	A qualified anesthesiology provider must be designated as the liaison to the trauma program.			R	R
11-4	Anesthesia services must be available in-house 24 hours a day	R	R		
11-5	When anesthesiology senior residents or CRNAs are used to fulfill availability requirements, the attending anesthesiologist on call must be advised, available within 30 minutes at all times, and present for all operations	R	R		
11-6	The availability of anesthesia services and delays in airway control or operations must be documented by the hospital PIPS process	R	R	R	R
11-7	Anesthesiologists or CRNAs must be available within 30 minutes			R	R
11-8	Trauma centers without in-house anesthesia services must have protocols in place to ensure the timely arrival at the bedside by the anesthesia provider within 30 minutes of notification and request.			R	R
11-9	Under these circumstances, the presence of a physician skilled in emergency airway management must be documented			R	R
11-10	All anesthesiologists taking call must have successfully completed an anesthesia residency program	R	R		
11-11-1	The anesthesiologist liaison taking call must be currently board certified or eligible for certification by an appropriate anesthesia board according to current requirements in anesthesiology	R	R		

11-11-2	Board certification or eligibility for certification is essential for anesthesiologists who take trauma call.	R	R		
11-12	Trauma centers participation in the trauma PIPS program by the anesthesia liaison is essential	R	R	R	
11-13	The anesthesiology liaison to the trauma program must attend at least 50 percent of the multidisciplinary peer review meetings, with documentation by the trauma PIPS program	R	R	R	
11-14	An operating room must be adequately staffed and available within 15 minutes	R	R		
11-15	If the first operating room is occupied, an adequately staffed additional room must be available	R	R		
11-16	Availability of the operating room personnel and timeliness of starting operations must be continuously evaluated by the trauma PIPS process and measures must be implemented to ensure optimal care	R	R		
11-17	An operating room must be adequately staffed and available within 30 minutes			R	R
11-18	If an on-call team is used, the availability of operating room personnel and the timeliness of starting operations must be continuously evaluated by the trauma PIPS process, and measures must be implemented to ensure optimal care			R	R
11-19	All trauma centers must have rapid fluid infusers, thermal control equipment for patients and resuscitation fluids, intraoperative radiologic capabilities, equipment for fracture fixation, and equipment for bronchoscopy and gastrointestinal endoscopy	R	R	R	
11-20	Trauma centers that provide neurosurgical services must have the necessary equipment to perform a craniotomy.	R	R	R	R
11-21	Must have cardiothoracic surgery capabilities available 24 hours per day and should have cardiopulmonary bypass equipment	R			
11-22	If cardiopulmonary bypass equipment is not immediately available, a contingency plan, including immediate transfer to an appropriate center and 100 percent performance improvement review of all patients transferred, must be in place	R	R		
11-23	Must have an operating microscope available 24 hours per day	R			
11-24	A PACU with qualified nurses must be available 24 hours per day to provide care for the patient if needed during the recovery phase	R	R	R	R
11-25	If this availability requirement is met with a team on call from outside the hospital, the availability of the PACU	R	R	R	R

	nurses and compliance with this requirement must be documented by the PIPS program				
11-26	The PACU must have the necessary equipment to monitor and resuscitate patients, consistent with the process of care designated by the institution	R	R	R	R
11-27	The PIPS program, at a minimum, must address the need for pulse oximetry, end-tidal carbon dioxide detection, arterial pressure monitoring, pulmonary artery catheterization, patient rewarming, and intracranial pressure monitoring	R	R	R	R
11-28	There must be policies designed to ensure that trauma patients who may require resuscitation and monitoring are accompanied by appropriately trained providers during transportation to, and while in, the radiology department	R	R	R	R
11-29	Conventional radiography must be available 24 hours per day	R	R	R	R
11-30	Computed tomography (CT) must be available 24 hours per day	R	R	R	
11-31	An in-house radiology technologist and CT technologist are required	R	R		
11-32	Qualified radiologists must be available within 30 minutes in person or by teleradiology for the interpretation of radiographs	R	R	R	
11-33	Qualified radiologists must be available within 30 minutes to perform complex imaging studies, or interventional procedures	R	R		
11-34	Diagnostic information must be communicated in a written or electronic form and in a timely manner	R	R	R	R
11-35	Critical information deemed to immediately affect patient care must be verbally communicated to the trauma team in a timely manner	R	R	R	R
11-36	The final report must accurately reflect the chronology and content of communications with the trauma team, including changes between the preliminary and final interpretations	R	R	R	R
11-37	Changes in interpretation between preliminary and final reports, as well as missed injuries, must be monitored through the PIPS program	R	R	R	R
11-38	A radiologist must be appointed as liaison to the trauma program	R	R		
11-39	The radiologist liaison must attend at least 50 percent of peer review meetings and should educate and guide the entire trauma team in the appropriate use of radiologic services	R	R		
11-40	Participation in the trauma PIPS program process by the radiology liaison is essential	R	R		

11-41	At a minimum, radiologists must be involved in protocol development and trend analysis that relate to diagnostic imaging	R	R		
11-42	There must be a mechanism in place to view radiographic imaging from referring hospitals within their catchment area	R	R		
11-43	Board certification or eligibility for certification by an appropriate radiology board according to current requirements is essential for radiologists who take trauma call	R	R		
11-44	Interventional radiologic procedures and sonography must be available 24 hours per day	R	R		
11-45	Magnetic resonance imaging (MRI) capability must be available 24 hours per day	R	R		
11-46	The MRI technologist may respond from outside the hospital; however, the PIPS program must document and review arrival within 1 hour of being called. This time should meet current clinical guidelines	R	R		
11-47	If the CT technologist takes call from outside the hospital, the PIPS program must document the technologist's time of arrival at the hospital			R	
11-48	A surgically directed ICU physician team must be led by a surgeon boarded in surgical critical care, and critically ill trauma patients should be cared for in a designated ICU	R			
11-49-1	A surgeon with current board certification in surgical critical care must be designated as the ICU director	R			
11-49-2	The ICU team may be staffed by critical care physicians from different specialties but must remain surgically directed as noted above	R			
11-50	The ICU must be staffed with a dedicated ICU physician team led by the ICU director	R			
11-51	Appropriately trained physicians must be available in-house within 15 minutes to provide care for the ICU patients 24 hours per day	R			
11-52	If the trauma attending provides coverage, a backup ICU attending must be identified and readily available	R			
11-53	A surgeon must serve as co-director or director of the ICU and be actively involved in, and responsible for, setting policies and administrative decisions related to trauma ICU patients		R	R	
11-54	The ICU director or co-director should be currently board certified or eligibility for certification in surgical critical care in a Level II trauma center. In Level II and III facilities, the ICU director or co-director must be a surgeon who is currently board certified or eligible for certification by the current standard requirements		R	R	

11-55	Physician coverage of critically ill trauma patients must be available within 15 minutes 24 hours per day for interventions by a credentialed provider		R		
11-56	Physician coverage of the ICU must be available within 30 minutes, with a formal plan in place for emergency coverage			R	R
11-57	The PIPS program must review all ICU admissions and transfers of ICU patients to ensure that appropriate patients are being selected to remain at the Level III and Level IV center vs. being transferred to a higher level of care			R	R
11-58	The trauma surgeon must retain responsibility for the patient and coordinate all therapeutic decisions	R	R	R	R
11-59	Many of the daily care requirements can be collaboratively managed by a dedicated ICU team, but the trauma surgeon must be kept informed and concur with major therapeutic and management decisions made by the ICU team	R	R	R	R
11-60-1	The PIPS program must document that timely and appropriate ICU care and coverage are being provided	R	R	R	R
11-60-2	The timely response of credentialed providers to the ICU must be continuously monitored as part of the PIPS program	R	R	R	R
11-61	There must be a designated ICU liaison to the trauma service	R	R	R	
11-62	This [ICU] liaison must attend at least 50 percent of the multidisciplinary peer review meetings, with documentation by the trauma PIPS program	R	R	R	
11-63	The ICU liaison to the trauma program must accrue an average of 16 hours annually or 48 hours in 3 years of verifiable external trauma-related continuing medical education (CME), or through an internal educational process based on the principles of practice-based learning and the PIPS program	R	R		
11-64	Other members of the ICU trauma team must be knowledgeable about, and current in, the care of injured patients. This requirement must be documented by the acquisition of 16 hours of trauma-related CME per year, on average, or through an internal educational process conducted by the trauma program and the ICU liaison based on the principles of practice-based learning and the PIPS program	R	R		
11-65	Qualified critical care nurses must be available 24 hours per day to provide care for patients during the ICU phase	R	R	R	R
11-66	The patient-to-nurse ratio in the ICU must not exceed two to one	R	R	R	R

11-67	The ICU must have the necessary equipment to monitor and resuscitate patients	R	R	R	R
11-68	Intracranial pressure monitoring equipment must be available in Level I and II trauma centers and in Level III and Level IV trauma centers with neurosurgical coverage that admit neurotrauma patients	R	R	R	R
11-69	Trauma patients must not be admitted or transferred by a primary care physician without the knowledge and consent of the trauma service, and the PIPS program should monitor adherence to this guideline			R	R
11-70	Facilities are prepared to manage the most complex trauma patients and must have available a full spectrum of surgical specialists, including specialists in orthopaedic surgery, neurosurgery, cardiac surgery, thoracic surgery, vascular surgery, hand surgery, microvascular surgery, plastic surgery, obstetric and gynecologic surgery, ophthalmology, otolaryngology, and urology	R			
11-71	Must have the surgical specialists described (above) for Level I trauma centers and should provide cardiac surgery		R		
11-72-1	Must have the availability and commitment of orthopaedic surgeons			R	
11-72-2	For all patients being transferred for specialty care, such as burn care, microvascular surgery, cardiopulmonary bypass capability, complex ophthalmologic surgery, or high-complexity pelvic fractures, agreements with a similar or higher-qualified verified trauma center should be in place. If this approach is used, a clear plan for expeditious critical care transport, follow-up, and performance monitoring is required. If complex cases are being transferred out, a contingency plan should be in place and must include the following: <ul style="list-style-type: none"> • A credentialing process to allow the trauma surgeon to provide initial evaluation and stabilization of the patient. • Transfer agreements with similar or higher-verified trauma centers. • Direct contact with the accepting facility to arrange for expeditious transfer or ongoing monitoring support. • Monitoring of the efficacy of the process by the PIPS programs. 	R	R	R	R
11-73	Medical specialists on staff must include specialists in cardiology, internal medicine, gastroenterology, infectious disease, pulmonary medicine, and nephrology and their respective support teams (for example,	R	R		

	respiratory therapy, a dialysis team, and nutrition support)				
11-74	Internal medicine specialists must be available on the medical staff			R	
11-75	A respiratory therapist must be available in the hospital 24 hours per day	R	R		
11-76	There must be a respiratory therapist on call 24 hours per day			R	
11-77	Acute hemodialysis must be available	R	R		
11-78	Trauma centers that do not have dialysis capabilities must have a transfer agreement in place			R	
11-79	Nutrition support services must be available	R	R		
11-80	Laboratory services must be available 24 hours per day for the standard analyses of blood, urine, and other body fluids, including microsampling when appropriate	R	R	R	R
11-81	The blood bank must be capable of blood typing and cross-matching	R	R	R	R
11-82	The blood bank must have an adequate in-house supply of red blood cells, fresh frozen plasma, platelets, cryoprecipitate, and appropriate coagulation factors to meet the needs of injured patients	R	R		
11-83	The blood bank must have an adequate supply of packed red blood cells and fresh frozen plasma available within 15 minutes			R	R
11-84	Must have a massive transfusion protocol developed collaboratively between the trauma service and the blood bank	R	R	R	R
11-85	Coagulation studies, blood gas analysis, and microbiology studies must be available 24 hours per day	R	R	R	R
11-86	Advanced practitioners who participate in the initial evaluation of trauma patients must demonstrate current verification as an ATLS® provider	R	R	R	R
11-87-1	The trauma program must demonstrate appropriate orientation, credentialing processes, and skill maintenance for advanced practitioners, as witnessed by an annual review by the TMD	R	R		
11-87-2	The trauma program must demonstrate appropriate orientation, credentialing processes, and skill maintenance for advanced practitioners.			R	R
REHABILITATION					
12-1	Rehabilitation services must be available within the hospital's physical facilities or as a freestanding rehabilitation hospital, in which case the hospital must have transfer agreements	R	R		
12-2	Rehabilitation consultation services, occupational therapy, speech therapy, physical therapy, and social services must be available	R	R		

12-3	Physical therapy must be provided	R	R	R	
12-4	Social services must be provided	R	R	R	
12-5	Occupational therapy must be provided	R	R		
12-6	Speech therapy must be provided	R	R		
12-7	The following services must be available during the acute phase of care, including intensive care: physical therapy, social services, occupational therapy and speech therapy	R	R		
GUIDELINES FOR THE OPERATION of BURN CENTERS					
14-1	Centers that refer burn patients to a designated burn center must have in place written transfer agreements with the referral burn center	R	R	R	R
TRAUMA REGISTRY					
15-1	Trauma registry data must be collected and analyzed	R	R	R	R
15-2	Data must be collected in compliance with the National Trauma Data Standard (NTDS) and submitted to the National Trauma Data Bank® (NTDB®) every year in a timely fashion so that they can be aggregated and analyzed at the national level	R	R	R	
15-3	The trauma registry is essential to PIPS program and must be used to support the PIPS process	R	R	R	R
15-4	Findings must be used to identify injury prevention priorities that are appropriate for local implementation	R	R	R	R
15-5	Trauma centers must use a risk adjusted benchmarking system to measure performance and outcomes	R	R	R	
15-6	Trauma registries should be concurrent. At a minimum, 80 percent of cases must be entered within 60 days of discharge	R	R	R	R
15-7	The Trauma Registrar must attend or have previously attended two courses within 12 months of being hired: (1) the American Trauma Society's Trauma Registrar Course or equivalent provided by a state trauma program; and (2) the Association of the Advancement of Automotive Medicine's Injury Scaling Course or an equivalent local course.	R	R	R	R
15-8	The trauma program must ensure that appropriate measures are in place to meet the confidentiality requirements of the data	R	R	R	R
15-9-1	One full-time equivalent employee dedicated to the registry must be available to process the data capturing the NTDS data set for every 500 admitted trauma patients annually	R	R		
15-9-2	A proportionate FTE must be employed for hospitals with less than 500 admitted trauma patients annually			R	R
15-10	Strategies for monitoring data validity are essential	R	R	R	R
PERFORMANCE IMPROVEMENT AND PATIENT SAFETY (PIPS)					

16-1-1	Trauma centers must have a PIPS program that includes a comprehensive written plan outlining the configuration and identifying both adequate personnel to implement that plan and an operational data management system	R	R	R	
16-1-2	The PIPS program must be supported by the collection and analysis of trauma registry data to identify opportunities for improvement	R	R	R	R
16-1-3	The processes of event identification and levels of review must result in the development of corrective action plans, and methods of monitoring, reevaluation, and benchmarking must be present	R	R	R	R
16-2-1	Problem resolution, outcome improvements, and assurance of safety (“loop closure”) must be readily identifiable through methods of monitoring, reevaluation, benchmarking, and documentation	R	R	R	
16-2-2	Peer review must occur at regular intervals to ensure that the volume of cases is reviewed in a timely fashion.	R	R	R	R
16-3-1	The trauma PIPS program must integrate with the hospital quality and patient safety effort and have a clearly defined reporting structure and method for provision of feedback	R	R	R	
16-3-2	The trauma PIPS program is endorsed by the hospital governing body and is empowered to address events that involve multiple disciplines.	R	R	R	R
16-3-3	There must be documented, adequate administrative support to ensure evaluation of all aspects of trauma care	R	R	R	R
16-3-4	The TMD and TPM must have the authority and be empowered by the hospital governing body to lead the program	R	R	R	R
16-3-5	The TMD must have sufficient authority to set the qualifications for the trauma service members, including individuals in specialties that are routinely involved with the care of the trauma patient	R	R	R	
16-3-6	The TMD must have authority to recommend changes for the trauma panel based on performance review	R	R	R	
16-3-7	The peer review committee must be chaired by the TMD	R	R	R	
16-3-8	Representatives from general surgery, emergency medicine, orthopaedics, and anesthesiology, critical care—and for Level I and II centers, neurosurgery, and radiology—actively participate in the trauma PIPS program and attend at least 50 percent of the multidisciplinary trauma peer review committee meetings	R	R	R	
16-3-9	Any emergent neurosurgical cases must also have the participation of neurosurgery on the multidisciplinary trauma peer review committee			R	

16-3-10	The TMD, TPM, and liaisons in emergency medicine, orthopaedics, and neurosurgery must obtain 16 hours annually or 48 hours in 3 years of verifiable, external, trauma-related education (CME or CE, as appropriate to the discipline).	R	R		
16-3-11	The liaison in critical care must obtain 16 hours annually or 48 hours in 3 years of verifiable, external, trauma-related CME or through an internal educational process based on the principles of practice-based learning and the PIPS program	R	R		
16-3-12	The trauma center must demonstrate that all trauma patients can be identified for review	R	R	R	R
16-3-13	The trauma registry must submit the required data elements to the NTDB	R	R	R	
16-3-14	The trauma PIPS program must be supported by a registry and a reliable method of concurrent data collection that consistently obtains information necessary to identify opportunities for improvement	R	R	R	R
16-3-15	All trauma centers must use a risk adjusted benchmarking system to measure performance and outcomes	R	R	R	
16-4	A trauma program must use clinical practice guidelines, protocols, and algorithms derived from evidenced-based validated resources in order to achieve the goal of using a risk adjusted benchmarking system to measure performance and outcomes	R	R	R	
16-5	All process and outcome measures must be documented within the trauma PIPS program's written plan and reviewed and updated at least annually	R	R	R	R
16-6-1	All trauma-related mortalities must be systematically reviewed and those mortalities with opportunities for improvement identified for peer review. 1. Total trauma-related mortality rates. Outcome measures for total, pediatric (younger than 15 years), and geriatric (older than 64 years) trauma encounters should be categorized as follows: a) DOA (pronounced dead on arrival with no additional resuscitation efforts initiated in the emergency department); b. DIED (died in the emergency department despite resuscitation efforts); c. In-hospital (including operating room). 2. Mortality rates by Injury Severity Scale (ISS) subgroups	R	R	R	
16-6-2	Trauma surgeon response to the emergency department for highest level of activation must be monitored, documented and reviewed	R	R	R	R

16-6-3	Criteria for all levels of trauma team activation (TTA) must be defined and reviewed annually	R	R	R	R
16-6-4	All TTAs must be categorized by the level of response and quantified by number and percentage	R	R	R	R
16-6-5	Trauma surgeon response time to other levels of TTA, and for back-up call response, should be monitored, documented and reviewed	R	R	R	
16-6-6	Response parameters for consultants addressing time-critical injuries (for example, epidural hematoma, open fractures, and hemodynamically unstable pelvic fractures) must be determined and monitored	R	R	R	
16-7-1	Rates of undertriage and overtriage must be monitored and reviewed quarterly	R	R	R	
16-7-2	Trauma centers admitting at least 100 pediatric trauma patients (≤ 14 years) annually require a pediatric-specific trauma PIPS program. Trauma centers admitting less than 100 pediatric trauma patients annually must review each case for timeliness and appropriateness of care	R	R		
16-7-3	All trauma patients who are diverted or transferred during the acute phase of hospitalization to another trauma center, acute care hospital, or specialty hospital (for example, burn center, reimplantation center, or pediatric trauma center) or patients requiring cardiopulmonary bypass or when specialty personnel are unavailable must be subjected to individual case review to determine the rationale for transfer, appropriateness of care, and opportunities for improvement. Follow-up from the center to which the patient was transferred should be obtained as part of the case review.	R	R	R	R
16-7-4	Instances in which the emergency department is left uncovered must be reviewed for timeliness of Emergency physician's response and appropriateness of care			R	
16-7-5	Trauma center diversion-bypass hours must be routinely monitored, documented, and reported, including the reason for initiating the diversion policy, and must not exceed 5 percent.	R	R	R	
16-7-6	All cases with neurologic injury must be monitored, and any case not transferred to higher level of care is subject to case review for timeliness of response and appropriateness of care			R	
16-7-7	<ul style="list-style-type: none"> • In-house anesthesia service (emergency department, intensive care unit, floor, and postanesthesia care unit) must be available for the care of trauma patients • Operating room delays involving trauma patients because of lack of anesthesia support services must be identified and reviewed to determine the reason for 	R	R	R	

	delay, adverse outcomes, and opportunities for improvement.				
16-7-8	Delay in operating room availability must be routinely monitored. Any case that is associated with a significant delay or adverse outcome must be reviewed for reasons for delay and opportunities for improvement.	R	R	R	
16-7-9	Response times of operating room and postanesthesia care unit personnel when responding from outside the trauma center must be routinely monitored.	R	R	R	
16-7-10	Rate of change in interpretation of radiologic studies should be categorized by RADPEER or similar criteria (describe process/scoring metric used).	R	R	R	
16-7-11	Response times of computed tomography technologist(30 minutes)/magnetic resonance imaging (60 minutes) technologist/interventional radiology team (30 minutes) when responding from outside the trauma center	R	R	R	
16-8	Transfers to a higher level of care within the institution	R	R	R	R
16-9-1	Solid organ donation rate	R	R	R	
16-9-2	The percentage of completed registry records within two months of discharge should be determined.	R	R	R	R
16-9-3	Multidisciplinary trauma peer review committee attendance	R	R	R	
16-9-4	Must admit at least 1,200 trauma patients yearly or have 240 admissions with an ISS of more than 15	R			
16-10	Sufficient mechanisms must be available to identify events for review by the trauma PIPS program	R	R	R	R
16-11	Once an event is identified, the trauma PIPS program must be able to verify and validate that event	R	R	R	R
16-12	There must be a process to address trauma program operational events	R	R	R	
16-13	Documentation (minutes) reflects the review of operational events and, when appropriate, the analysis and proposed corrective actions	R	R	R	
16-14-1	Mortality data, adverse events and problem trends, and selected cases involving multiple specialties must undergo multidisciplinary trauma peer review	R	R	R	
16-14-2	This effort may be accomplished in a variety of formats but must involve the participation and leadership of the TMD; the group of general surgeons on the call panel; and the liaisons from emergency medicine, orthopaedics, neurosurgery, anesthesia, critical care, and radiology	R	R	R	
16-15	Each member of the committee must attend at least 50 percent of all multidisciplinary trauma peer review committee meetings	R	R	R	
16-16	When general surgeons cannot attend the multidisciplinary trauma peer review meeting, the TMD	R	R	R	

	must ensure that they receive and acknowledge the receipt of critical information generated at the multidisciplinary peer review meeting to close the loop				
16-17	The multidisciplinary trauma peer review committee must systematically review mortalities, significant complications, and process variances associated with unanticipated outcomes and determine opportunities for improvement	R	R	R	
16-18	When an opportunity for improvement is identified, appropriate corrective actions to mitigate or prevent similar future adverse events must be developed, implemented, and clearly documented by the trauma PIPS program	R	R	R	
16-19	An effective performance improvement program demonstrates through clear documentation that identified opportunities for improvement lead to specific interventions that result in an alteration in conditions such that similar adverse events are less likely to occur	R	R	R	
OUTREACH AND EDUCATION					
17-1	Engage in public and professional education	R	R	R	R
17-2	Trauma centers must provide some means of referral and access to trauma center resources	R	R		
17-3	Must have continuous rotations in trauma surgery for senior residents (Clinical PGY 4–5) that are part of an Accreditation Council for Graduate Medical Education–accredited program. For pediatric Level I centers, the continuous rotation for surgical residents is extended to include clinical PGY 3	R			
17-4-1	The hospital must provide a mechanism to offer trauma-related education to nurses involved in trauma care	R	R	R	
17-4-2	Resuscitation nurses must take initial 16 hour accredited course in the care of trauma patients followed by recertification or 4 hours/year of trauma-related continuing education	R	R	R	R
17-4-3	The successful completion of ATLS® course, at least once, is required for all general surgeons, emergency physicians and midlevel providers on the trauma team	R	R	R	R
17-4-4	The TD and the liaison representative from neurosurgery, orthopaedic surgery, and emergency medicine must accrue an average of 16 hours annually, or 48 hours in 3 years, of external trauma-related CME.	R	R		
17-4-5	The liaison representative from critical care must accrue an average of 16 hours annually, or 48 hours in 3 years, of external trauma-related CME, or through an internal educational process conducted by the trauma program based on the principles of practice-based learning and the PIPS program.	R	R		

17-4-6	Other members of the general surgery, neurosurgery, orthopaedic surgery, emergency medicine and critical care specialties who take trauma call must also be knowledgeable and current in the care of injured patients.	R	R		
PREVENTION					
18-1	Trauma centers must have an organized and effective approach to injury prevention and must prioritize those efforts based on local trauma registry and epidemiologic data	R	R	R	R
18-2-1	Each trauma center must have someone in a leadership position that has injury prevention as part of his or her job description	R	R	R	R
18-2-2	This individual must be a prevention coordinator (separate from the TPM) with a job description and salary support	R			
18-3	Universal screening for alcohol use must be performed for all injured patients and must be documented	R	R	R	R
18-4	All patients who have screened positive must receive an intervention by appropriately trained staff, and this intervention must be documented	R	R		
18-5	At least two programs that address one of the major causes of injury in the community must be implemented	R	R		
18-6	A trauma center's prevention program must include and track partnerships with other community organizations	R	R		
TRAUMA RESEARCH AND SCHOLARSHIP					
19-1	A program must have 20 peer-reviewed articles published in journals included in Index Medicus or PubMed in a 3-year period at a minimum	R			
19-2	These publications must result from work related to the trauma center or the trauma system in which the trauma center participates	R			
19-3	Of the 20 articles, at least one must be authored or co-authored by members of the general surgery trauma team	R			
19-4-1	Additionally, at least one article each from three of the following disciplines is required: basic sciences, neurosurgery, emergency medicine, orthopaedics, radiology, anesthesia, vascular surgery, plastics/maxillofacial surgery, critical care, cardiothoracic surgery, rehabilitation, and nursing	R			
19-4-2	A pediatric Level I center's research requirement is equivalent to that of adult Level 1 trauma centers	R			
19-4-3	In combined Level I adult and Level I pediatric centers, half of the research requirement must be pediatric research	R			

19-7	<p>In the alternate method, a Level I program must have the following: a) A program must have 10 peer-reviewed articles published in journals included in Index Medicus or PubMed in a 3-year period. These articles must result from work related to the trauma center or the trauma system in which the trauma center participates. Of the 10 articles, at least one must be authored or co-authored by members of the general surgery trauma team, and at least one article each from three of the following disciplines is required: basic sciences as related to injury, neurosurgery, emergency medicine, orthopaedics, radiology, anesthesia, vascular surgery, plastics/ maxillofacial surgery, critical care, cardiothoracic surgery, rehabilitation, and nursing. Trauma-related articles authored by members of other disciplines or work done in collaboration with other trauma centers and participation in multicenter investigations may be included in the remainder.</p> <p>b) Of the following seven trauma-related scholarly activities, four must be demonstrated:</p> <ul style="list-style-type: none"> • Evidence of leadership in major trauma organizations, which includes membership in trauma committees of any of the regional or national trauma organizations. • Demonstrated peer-reviewed funding for trauma research from a recognized government or private agency or organization. • Evidence of dissemination of knowledge that includes review articles, book chapters, technical documents, Web-based publications, videos, editorial comments, training manuals, and trauma-related educational materials or multicenter protocol development. • Display of scholarly application of knowledge as evidenced by case reports or reports of clinical series in journals included in MEDLINE. • Participation as a visiting professor or invited lecturer at national or regional trauma conferences. • Support of resident participation in mentoring scholarly activity, including laboratory experiences; clinical trials; resident trauma paper competitions at the state, regional, or national level; and other resident trauma presentations. • Mentorship of fellows, as evidenced by the development or maintenance of a recognized trauma, critical care, or acute care surgery fellowship 	R			
19-8	<p>The administration must demonstrate support for the research program by, for example, providing basic laboratory space, sophisticated research equipment, advanced information systems, biostatistical support, salary support for basic and translational scientists, or seed grants for less experienced faculty</p>	R			

DISASTER PLANNING AND MANAGEMENT					
20-1	Trauma centers must meet the disaster-related requirements of OAR 333-515-0030	R	R	R	R
20-2	A surgeon or delegate from the trauma panel must be a member of the hospital's disaster committee	R	R	R	
20-3	Hospital drills that test the individual hospital's disaster plan must be conducted at least twice a year, including actual plan activations that can substitute for drills	R	R	R	R
20-4	All trauma centers must have a hospital disaster plan described in the hospital's policy and procedure manual or equivalent	R	R	R	R
SOLID ORGAN PROCUREMENT ACTIVITIES					
21-1	The trauma center must have an established relationship with a recognized OPO	R	R	R	
21-2-1	A written policy must be in place for triggering notification of the regional OPO	R	R	R	
21-2-2	Must review its solid organ donation rate annually	R	R	R	
21-3	Written protocols defining the clinical criteria and confirmatory tests for the diagnosis of brain death are required	R	R	R	R