Trauma Systems Development:
The Level III Center

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What is a level 3 trauma center?

- Level 3 trauma centers are often located in rural settings or areas with limited access to more advanced trauma care. Frequently, a Level 3 center is a component in a larger healthcare system that includes Level 1 and/or 2 centers.
- Level 3 centers are often the first access to care for critically injured patients. As such, a well-organized approach with an emphasis on stabilization and transfer, when indicated, is paramount
    - As verified trauma centers, Level 3 centers should have a well-defined list of injuries that can be managed within their own centers and injuries that should be transferred to a higher level of care
- Requirements vary, with some states pursuing designation from the American College of Surgeons (ACS) and others pursuing local state designation.
    - ACS requires general & orthopedic surgical availability
    - All trauma centers, including level 3 centers, should have trauma administrative personnel and structure. The minimum trauma administrative personnel consist of a trauma medical director, trauma program manager (sometimes called trauma nurse coordinator), and a trauma registrar.
    - To be a successful trauma center, hospital administrative support is essential. Hospitals typically demonstrate this with an identifiable trauma budget and a letter from the CEO stating support for the program.
    - In some locations, the level 3 trauma center may be the lead facility in a region without higher levels of care in close proximity.

- **Capabilities**
    - The emergency department (ED) is the primary site of trauma care for level 3 trauma centers. As such, full ED capabilities are required.
    - Level 3 trauma centers must be able to perform common trauma procedures, including (but not limited to) emergency airways, chest tube insertion, and IV access (peripheral, IO, central access)
    - Level 3 centers should be adept at utilizing modern resuscitation concepts, including permissive hypotension and hemostatic resuscitation. Internal education programs (including mock trauma resuscitations) and other CME-qualified educational courses (e.g. ATLS, Rural Trauma Team Development Course, etc.) can be used to ensure providers are up to date on these concepts. The Performance Improvement Program should review resuscitations to monitor for compliance.
    - A tiered activation system is required for Level 3 centers. Level 1 activation require surgeon response at the bedside within 30 minutes. Level 2 activations

are typically managed by the Emergency Department team, with general surgery or orthopedic consultations at the ED physician discretion.
    - Most trauma patients seen at level 3 trauma centers will be low acuity. However, a small subset of patients will require immediate operative intervention for hemorrhage control, including damage control procedures prior to transfer. Level 3 centers must have access to operative capabilities, imaging and blood bank services at all hours.
    - The admitting service for trauma patients may vary depending on center resources. Ideally, trauma patients are admitted to a surgical service—either orthopedics or trauma/general surgery. In some instances, a hospitalist may admit with consultations from orthopedics and trauma. Non-surgical admissions should be minimized as much as possible. The PI program should review all trauma admissions to a non-surgical service.
    - In order to perform complete trauma evaluations, 24 hour radiology capability, including CT scan, is an essential component of level 3 trauma centers.
    - Level 3 trauma centers should have ICU capabilities, including access to physicians with critical care training, for indicated patients.

- **Management of the Level 3 Trauma Program**
    - Stabilization and transfer is indicated for severely injured patients. Prior to transfer, initial evaluation and management should be performed at the Level 3 trauma center. This initial management is a strength of level 3 trauma centers relative to non-trauma centers. Key elements include:
        - Early airway management, including basic airway, advanced airway, and surgical airway management.
        - Initiation of resuscitation, with Level 3 centers well-versed in concepts of hemostatic resuscitation, early blood transfusion, balanced-ratio blood product transfusion, and permissive hypotension.
        - Access to surgical consultants for emergent stabilization.
    - Level 3 centers have the capability to admit and manage less severely injured patients. All trauma admissions should be monitored as part of the process improvement function of the trauma program.
        - Management protocols are a key part of a Level 3 program and ensure a consistent and high-quality care .
    - Level 3 trauma centers utilize well-defined activation criteria to rapidly mobilize the appropriate personnel to evaluate and treat incoming trauma patients.
    - Transfer agreements for complex trauma or subspecialty care must be present to facilitate transfer from level 3 centers to higher levels of care.

- **Level 3 Center Considerations**
    - Capabilities may vary by institution. As a surgeon taking trauma call at a level 3 center, it is important to know the capabilities of your trauma center.

        - The trauma surgeon is usually a general surgeon and formal trauma or surgical critical care training is not required.
    - On-call surgeons are not required to take 'in-house' call. There is a 30-45 minute response time requirement for the highest activation level.
    - Orthopedic surgical consultants are required for Level 3 centers. The need for other specialty consultation often drives transfer to higher levels of care.
    - State EMS trauma destination guidelines may affect patient flow. In regions with multiple trauma centers, destination guidelines will dictate which patients are transported to the Level 3 center. These are typically relatively low acuity patients or those without significant physiologic derangement. In more isolated trauma environments, the Level 3 center may be the preferred destination for trauma patients.

Level 3 Trauma Medical Director (TMD)

- The Trauma Medical Director is the leader of the Trauma Program at any trauma center, and this is especially true at level 3 trauma centers. The TMD is often the local trauma expert, usually without formal fellowship training but with a special interest in the care of the injured patient.
- The TMD is also the director of Trauma Performance Improvement and Patient Safety (PIPS) Program, including peer review. This is arguably the most important administrative role of the TMD at Level 3 trauma centers. One of the most important jobs of the TMD is to be an advocate for the trauma program and patients.
- The TMD leads the multidisciplinary trauma committee and serves as the chair of the committee.
- A key role of the TMD is to oversee and/or manage trauma physician call schedule. Additionally, an important role of the TMD is to interface with other physician colleagues including:
    - General Surgeons
    - Emergency Department
    - Orthopedics
    - Hospitalists
    - Intensivists
    - Surgical Subspecialists
    - Anesthesia
    - Radiology
- To ensure the hospital has appropriate resources and personnel to run a level 3 trauma center, the TMD will need regularly interact with hospital administration. Optimizing prehospital care is essential to ensure good outcomes for trauma patients. This will require the TMD to interact with local EMS system leadership as well.

- The Trauma Medical Director also participates in larger trauma systems at the local/regional/state level, including emergency preparedness. This also includes participation in the state Committee on Trauma.

Trauma Program Management

- The TPM at a level 3 trauma center will often serve as an administrator of the trauma program. Responsibilities of this role typically include:
    - Working with the Trauma Medical Director to establish trauma protocols, processes and systems for the execution of trauma care.
    - Work with Trauma Registrar to maintain an accurate and up-to-date registry.
    - Advocate for the trauma program to hospital administration.
    - Adhere to state trauma designation requirements.
    - Participate in local/regional/state trauma system.
- The Trauma Program Manager is a critical position at a Level 3 program. This individual oversees the process improvement program, to ensure consistent and high-quality care to injured patinets.
- The performance improvement (PI) program is the heart and soul of the trauma program. The PI program should review of all activations, admissions, transfers, and deaths to ensure optimal care of trauma patients evaluated at the trauma center. At smaller Level 3 hospitals, the PI portion of the trauma program may be integrated into the hospital-wide peer review program. This practical reality is acceptable so long as the trauma PI aspect remains a distinct part of the hospital's quality program. Key responsibilities of a PI program include:
    - Create and review management protocols, including activation criteria, transfer criteria, resuscitation protocol, admission protocols
    - Reviews trauma activations.
    - Reviews trauma admissions/transfers.
    - Reviews all deaths.
    - Review timeliness of provider & ancillary personnel (radiology, lab, etc.) response.
    - Integrates into hospital-wide mortality/peer review process.
    - Sets quality metrics for trauma patients.
    - Tracks outcomes.
    - Monitors for adherence to trauma protocols.
- The PI program at a level 3 center is typically smaller than at larger trauma centers. Smaller volumes can be beneficial in that each admission and activation can be reviewed in greater detail.

Educational Responsibilities

- Local education is the responsibility of the TMD at a level 3 center. The main focus of educational efforts should be directed at the emergency department, both physician and

nursing staff. The other areas for trauma education include: inpatient nursing staff, operating room staff, and the other general surgeons in the trauma call pool. Educational efforts can be integrated, but should also involve targeted educational opportunities.

- ATLS, TNCC and Rural Trauma Team Development Course (RTTDC) are great options for providing trauma-specific education.
- Regional educational offerings are also important. RTTDC and ATLS are excellent options if the level 3 trauma center is the only center in the region, but personalized lectures given to EMS personnel can also effective.
- Community outreach and injury prevention programs are excellent ways to educate the community at-large. These are also a requirement for trauma center designation.