Kentucky Trauma Hospital Resource Manual

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Kentucky Cabinet for Health and Family Services
Department for Public Health
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The Kentucky Trauma Advisory Committee (KyTAC)
wishes to acknowledge that we have liberally used the
excellent work of the Minnesota Trauma System
for inspiration. Many of our own thoughts and planning
seemed to parallel work that Minnesota had already done well.

So, building on the success of those who went before us,
we freely admit that we have borrowed liberally
from their excellent talents to create the starting
point for our new trauma care system.

Resource Manual

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This manual contains a description of the designation process as well as examples of sample policies and forms to help you develop your hospital's trauma program.

Trauma Hospital Designation

Verification vs. Designation

For years Kentucky had Level I trauma centers located in the population-dense areas of Louisville and Lexington, and in the rural areas of Campbellsville and Madisonville. These hospitals were evaluated by the American College of Surgeons (ACS) Committee on Trauma (also referred to as ACS COT) which verified that they met at least the minimum criteria for a trauma center established by the ACS.

In 2008 the Kentucky General Assembly passed a bill authorizing the Commissioner of Health, Kentucky Department for Public Health (KDPH), to develop a statewide trauma care system, including a process to designate hospitals as trauma centers. The law also created a Kentucky Trauma Advisory Committee (KyTAC) to work with and assist the commissioner with the development of the system. References to law can be found in Attachment AA of this manual.

The law did not specify how the system was to be configured, but the KyTAC advised the commissioner to use the ACS COT Level I, II and III standards, and has developed a set of verification criteria and processes for Level IV based on guidance in the ACS COT reference, "Resources for Optimal Care of the Injured Patient".

The term "*designation*" is an official label assigned by a political authority. Hospitals in Kentucky can *volunteer* to become part of the trauma care system, and submit for state *designation* as a trauma center at a specific level of capability. *Designated* trauma center in Kentucky must demonstrate that they meet the state's recognized criteria for a trauma hospital. The standards and process are spelled out in 902 KAR Chapter 28. Designation is for a defined period of time, and must be periodically re-verified to maintain that level of designation.

The term "*verification*" is a process of reviewing the hospital and its trauma program against established criteria. As noted above, for Levels I-III Kentucky currently recognizes the ACS COT standards and verification process. For Level IV, Kentucky has developed its own standards and verification process, based upon ACS guidance and the recommendations of the KyTAC. *Hospitals must be **verified** as having met Kentucky's recognized standards and criteria before they can be designated at a specific level.*

Level I, II and III Designation Process

The designation process in Kentucky is a voluntary program for hospitals. The KDPH currently accepts ACS level I, II or III verification as adequate evidence that a hospital meets the standards for the appropriate level.

The ACS requires a hospital which is anticipating a request for verification as a Level I, II or III trauma center to have a working, documentable trauma program in place. This will include such things as the designated personnel, training, an effective quality improvement program, educational outreach and about a year's data to document that a functioning system is in place and working effectively.

Since the facility will have a working trauma program, KDPH and the Kentucky Trauma Advisory Committee would like to be aware of the developing trauma center, to track its progress and assist as necessary. To that end, the hospitals can start the *voluntary* trauma center designation process in Kentucky by submitting a letter of intent to the *Commissioner, Kentucky Department for Public Health in advance of an anticipated ACS-COT verification site visit.* The letter shall identify their trauma care system team with contact information, their initial trauma center development plan, and the anticipated timeline for the ACS verification site visit. It should project when the facility will be able to start reporting its trauma data to the Kentucky Trauma Registry using software meeting the requirements of the 902 KAR Chapter 28.

When the hospital completes the ACS verification process, the facility will complete the *Request for Trauma Center Designation Application* as a Level I, II or III trauma center in Kentucky using the application that can be downloaded from the Kentucky Trauma Care System website. A copy of the ACS Certificate of Verification, and a copy of the verification report, will be attached to and become part of the application package.

The KyTAC will review the application package, and will make recommendations to the commissioner about the potential designation of the facility as a *Trauma Center* in the Commonwealth of Kentucky. *The length of time the Kentucky Trauma Center designation is valid is tied directly to the expiration period for the ACS verification.* Re-verification will require the facility to apply for re-designation.

If a trauma hospital experiences a change in its ability to meet the minimum required criteria at any time during the designation period, it must notify the commissioner, and subsequently the KyTAC, immediately. This element is critical to the effectiveness of the statewide trauma program because it may require other regional hospitals and local EMS providers to adjust their operating guidelines.

Level IV Designation Process

ACS does not currently have verification criteria and processes in place beyond Level III, even though its guidance discusses the concept of system development beyond Level III. The Kentucky Trauma Care System has developed criteria and standards for a Level IV designation that will be discussed further in this manual. Level IV "Criteria for State Verification" is in Attachment Z.

As with Levels I-III, the designation of Level IV trauma facilities in Kentucky is *voluntary*. KDPH empowers the Kentucky Trauma Advisory Committee to *verify* the presence of the resources and processes required and published by the KyTAC. Once verified, KyTAC will recommend to the commissioner that the facility is prepared to be recognized and designated as a Level IV *Kentucky Trauma Center*. The length of time that the designation is valid is tied directly to the expiration period for the verification. Re-verification will be required to apply for re-designation.

The hospital shall begin the process by first submitting a letter of intent to the *Commissioner, Kentucky Department for Public Health in advance of an anticipated verification site visit.* The letter should identify their trauma care system team with contact information, their initial trauma center development plan, and the anticipated timeline for the verification site visit. It should project when the facility will be able to start reporting its trauma data to the Kentucky Trauma

Registry using software meeting the requirements of 902 KAR Chapter 28. At least one year's data should be on file in the registry before a site visit is conducted.

When it appears that the key elements are in place, and the hospital feels it is ready, the hospital can either request a *consultation* visit, or can make application for a *verification* site visit and designation. **In either case, the costs for the team to perform this visit will be borne by the requesting facility.** The application will spell out required attachments, which will include (but may not be limited to) copies of the facility's Board Resolutions, trauma linkage agreements and trauma protocols as outlined in this manual. The application can be downloaded from the Kentucky Trauma Care System website.

Once complete, a copy of the verification site visit report, based on the "Criteria for State Verification" in Attachment Z, will be attached to and becomes part of the application. The KyTAC will review the complete application package, and will make recommendations to the commissioner about potential designation as a *Level IV Trauma Center* in the Commonwealth of Kentucky. The length of time the *Kentucky Trauma Center* designation is valid is tied directly to the expiration period for the verification. Re-verification will be required to apply for re-designation.

Level IV Consultation/Verification Program

The KyTAC Consultation/Verification Program is designed to assist hospitals in the evaluation and improvement of trauma care, and provide objective state review of institutional capability and performance. This is accomplished by an on-site review of the hospital by a peer review team appointed by the commissioner who has no conflict of interest with the hospital being verified, such as being on the medical staff or having a contract with the hospital or hospital system, and are experienced in the field of trauma care and trauma care system development. The team assesses commitment, readiness, resources, policies, patient care, protocols, performance improvement, and other relevant features as outlined in this manual.

Consultation: The KyTAC can provide a consultation visit to the requesting entity *if requested*. The consultation visit is performed to assess the entity's system of trauma care delivery or prepare for a verification review. The consultation visit is performed by a two-member team, one of which will be a physician and one will be a member of the KyTAC. The consultation visit will follow the same format as a verification review. The consultation visit will provide recommendations to aid the facility in attaining verification. A copy of the consultation visit report will be provided on an informational basis to the Verification Committee of the KyTAC. *A consultation visit is not required prior to verification.* Costs associated with a consultation visit are borne by the requesting facility.

Verification: Trauma center verification is the process by which the KyTAC confirms the hospital is performing as a trauma center according to the state's required criteria. A verification site visit is performed at the request of the facility. The verification process is performed by a two-person team appointed by the commissioner. The verification visit results in a report to the full KyTAC outlining the findings and, if successful, recommendation that a *Certificate of Verification* be issued. A *Certificate of Verification* is valid for the period specified in 902 KAR Chapter 28. Once a site verification process is successfully completed a re-verification visit can be requested thereafter. Costs associated with a verification site visit are borne by the requesting facility.

Re-verification: A facility that has previously been verified is eligible for re-verification if the facility applies for and schedules its visit *prior to the expiration* of the current certificate. If the facility does not schedule its re-verification visit to occur prior to the expiration there may be a lapse. If that lapse is over twelve (12) months KyTAC may recommend that the facility submit a new verification application.

Focus Review: If, during the verification or re-verification review, a hospital is found to have criteria deficiencies which at the discretion of the KyTAC are felt to be isolated and correctable, an on-site focus review may be necessary. In this case, another two-member team returns to the facility. The returning team usually consists of at least one original review member. The hospital must demonstrate that they have corrected the deficiencies before a certificate can be issued. This process is to be conducted *within six (6) months* and *not more than one (1) year* from the time of notification of the results of the initial review. The certificate of verification will be dated from the *initial* verification/re-verification visit. The costs for the team to perform this visit will be borne by the requesting facility.

If, on the other hand, the breadth and/or depth of deficiencies are extensive, the facility will generally not be eligible for a focused review. Rather, the facility can be denied verification, and will likely be required to apply for a new consultation or verification review when deficiencies are corrected. As with the original reviews, the costs for the teams to perform these visits will be borne by the requesting facility.

Re-designation: As noted above, *Kentucky Trauma Center* designations are valid for no more than the time period specified in 902 KAR Chapter 28. Trauma Centers should apply for re-designation at least three months before their expiration date. An existing designation may be provisionally extended up to 18 months if the hospital applied for re-designation in a timely manner and is either scheduled for a site visit, awaiting the results of the visit or responding to deficiencies identified during the visit.

The re-designation site visits will focus on three areas: 1) compliance with the designation criteria; 2) progress made toward strengthening the weaknesses identified during prior site visits; and 3) identifying how the system can collaboratively support the ongoing and future needs of the hospital's trauma care commitment. Specific suggestions for improvement will generally have an educational focus. The re-designation site visits are intended to be constructive, not punitive.

Hospital Organization

Before becoming designated, a formal trauma program must be established within the hospital. In addition to developing policies and protocols that address trauma team deployment, emergent transfers and performance improvement, the hospital board and medical staff must demonstrate a commitment to providing trauma care commensurate with the standards published by KyTAC and KDPH. Support for a hospital's participation in the statewide trauma care system is demonstrated when both the board of directors and the medical staff resolve to provide the resources necessary to attain and sustain designation. (*See Attachment A: Sample Hospital Board Resolution* and *Attachment B: Sample Medical Staff Resolution*.)

The hospital's trauma program will require both a trauma services medical director/advisor which is a physician who will provide clinical oversight for the program and a trauma program manager/coordinator which is usually a nurse who will be responsible for the administrative functions of the trauma program. (*See Attachment C: Sample Trauma Services Medical Director Job Description* and *Attachment D: Sample Trauma Program Manager/Coordinator Job Description*.)

The trauma program must be integrated into the hospital's organizational structure, appearing on the organizational chart. The position of the trauma program should be such that the trauma services medical director and trauma program manager/coordinator have sufficient authority to effect change across several departments. (*See Attachment E: Suggested Position of Trauma Program*.)

Trauma Team Activation

A clear procedure for assembling the team that will provide immediate resuscitation to the seriously injured patient is vital to the efficient functioning of a trauma hospital. This procedure should specify when the team must be assembled, who is to respond and how they are to be notified. The policy should build upon existing facility-specific internal operating procedures, staffing resources and established state minimum criteria. (See *Attachment F: Sample Single-Tier Trauma Team Activation Protocol* and *Attachment G: Sample Multi-Tier Trauma Team Activation Protocol*.)

Documentation of the patient's resuscitation can be easily accomplished with the use of a trauma flow sheet. A comprehensive flow sheet can also be used to easily identify data elements in the patient's chart required for trauma, and Traumatic Brain Injury (TBI) and Spinal Cord Injury (SCI) reporting (through the registry) or for performance improvement (PI) activities. (See *Attachment I: Trauma Resuscitation Record*. [Registry, TBI/SCI and PI elements are shaded to help facilitate data abstraction.])

Hospitals must work with their emergency medical services (EMS) provider(s) to establish and train with protocols designed to quickly identify seriously injured patients and route them directly to appropriate trauma center. It is expected that the hospital trauma team will be activated upon notice by EMS. It is up to the individual hospital to determine if EMS personnel will activate the team or if EMS will consult with the emergency department provider, who will then establish the need for activation. Continued work with the EMS professionals in your area will help to control over and under triaging.

Transfers

A well-functioning trauma care system is able to not only treat seriously injured trauma patients effectively and efficiently, but it is able to recognize the need to transfer patients to the trauma hospital that can best provide the resources that patient needs in a timely manner. To this end, level I, II, III and IV designations do not reflect the quality of care provided in those hospitals, but rather the resources available. Improved outcomes are closely associated with the time it takes for a facility to determine the need for and to accomplish the transfer.

Trauma center must establish procedures that direct the process for quickly and efficiently transferring a trauma patient to definitive care. Policy elements include anatomical and physiological criteria that if met, will immediately initiate transfer. (See *Attachment J: Suggested Criteria for Consideration of Transfer* and *Attachment M: Sample Trauma Transfer Protocol*.) Simple algorithmic transfer protocols can be found in Attachment K and Attachment L.

Ambulance service personnel, with the guidance of medical direction and in cooperation with their local hospitals, may establish a process to request aero medical transport to meet them at the emergency department. The establishment of a close working relationship with local EMS providers will contribute to the development of an efficient transfer process.

Transfer agreements must be established and maintained with trauma center capable of caring for patients with major trauma, severe burns and acute spinal cord injuries. An agreement with a second burn facility must also be maintained. (See *Attachment N: Transfer Agreement Examples*.) Receiving trauma center may provide the transfer agreement for the referring hospital.

Performance Improvement

Every *Kentucky Trauma Center* hospital is expected to measure, evaluate and improve its performance with respect to numerous objectives in health care from patient care standards to fiscal solvency to materials management. A successful performance improvement process is designed to identify weaknesses within an organization that prevent the organization from providing the optimal care it is capable of providing.

The process used to facilitate performance improvement may be referred to by other names, such as quality assurance or continuous quality improvement. Regardless of by what means your facility employs, it is important that there be a process in place to provide an intentional process, or loop, to continuously identify shortcomings in patient care, determine the likely cause, employ a plan to correct it, then evaluate whether or not the shortcoming has been resolved, thus “closing the loop.” A PI program will assist your facility to constantly improve itself by identifying and confronting problems within the institution. The process can be applied to virtually any element of performance within the hospital.

PI Structure

While the required PI components must be in place in a trauma hospital, the structure is left to the discretion of the facility and will depend on the facility size and available resources. It is anticipated that hospitals have an existing PI structure in place. The trauma program PI activities ideally are incorporated into that structure. The description of the PI process contained herein is not meant to be prescriptive, but illustrative. It is understood that facilities will

accomplish PI in a variety of ways. Trauma center are expected to be able to demonstrate the effectiveness of their program.

The trauma program should have a standing trauma PI team, usually made up of the trauma program manager/coordinator, the trauma services medical director and possibly the trauma program registrar. All information and reports pertaining to trauma program performance are funneled through this team. The data is then either used by the team to address system concerns or referred to one or more PI committees to address patient care concerns.

Both system and patient care-related issues can be identified via several methods.

- Chart abstraction
- Emails
- Hallway conversations
- Hospital information/database systems/registries
- Individual patient charts
- Multidisciplinary committee meetings
- Patient relations inquiries/complaints
- Personal observations
- Rounds
- Staff reports

Reports from staff can be generated via a PI tracking form. (See *Attachment O: Trauma PI Tracking Form*.)

Morbidity and Mortality Review Committee

The trauma program PI requirements include the establishment of a morbidity and mortality review committee, which is analogous to a physician peer review committee. Its purpose is to provide for review of physician performance. Membership on this committee should be physicians from several disciplines and may include non-physicians (such as nurse practioners [NPs] or physician assistants [PAs]), at the discretion of the trauma program and hospital administration. The format and activities of this committee are left largely to the discretion of the hospital. Physicians may not review their own care.

The morbidity and mortality review committee should meet regularly and review the physician care from patient charts, focusing on cases wherein problems, shortcomings, weaknesses or concerns have been identified by the trauma program PI team. If the committee members identify provider-related problems, they should recommend a corrective action plan; if they identify system-related concerns they should forward their findings to the trauma PI team.

This committee is also responsible to review all trauma deaths in the facility and classify them as non-preventable, potentially preventable or preventable. (See *Attachment P: Definitions of Trauma Death Classifications*.)

Multidisciplinary Trauma Review

Unlike the morbidity and mortality review committee, membership of the multidisciplinary trauma review committee is not limited to physician providers. The participants in this review are both clinical and non-clinical representatives from all disciplines involved in the care of the trauma patient.

Potential participants may be:

Administrators
Department managers
Emergency department nurses
Emergency department providers
EMS staff
Financial management
Floor nurses
ICU/PACU staff nurses
Laboratory technicians
Operating room nurses
Patient relations personnel
Radiologists
Radiologic Technologist
Rehabilitation professionals
Risk management staff
Social services staff
Surgeons

The trauma PI team should identify the cases for presentation to this committee. Again, the focus should be on problematic cases or educational opportunities presented by particular cases.

Filters

In addition to system problems and weakness, the team also seeks to identify occurrences of significant events. These events are represented by PI filters. Each filter reflects either an area of patient care that the trauma program would like to scrupulously observe, a standard of care that the facility has established for itself or an ideal expectation of the industry. These are essentially characteristics of system performance or patient care that automatically prompt the process of evaluating that element of the system or care of the patient to determine whether or not it met the standards defined by the industry or the hospital. The primary mechanism in which the trauma program will assess its performance is through the use of these filters.

The examples of filters listed in Table 1 should be perpetually included in the hospital's PI process.

Table 1

Audit filter	Level III	Level IV
Trauma care provided by physicians who do not meet the educational requirement of the plan (e.g., ATLS)	√	√
Trauma transfers	√	√
Trauma deaths	√	√
ED provider non-compliance with on-call response times	√	√
Trauma patients admitted to non-surgeons	√	√
General surgeon non-compliance with on-call response times	√	
Trauma care provided by NPs/PAs		√

It is anticipated that each hospital will also select its own filters to monitor. The filters will change constantly as the facility's need to evaluate various elements of the trauma program changes. Some filters may be watched for six months while others may need to be watched for years before enough cases have been through the hospital and enough data has been collected to effectively assess the system's performance.

Examples of filters commonly used include:

- Abdominal, thoracic or vascular surgery >24 hours after admission
- Absent hourly charting
- C-spine injury missed on initial evaluation
- EMS report not in patient chart
- EMS scene time >10 minutes without extrication involved
- GCS ≤8 left emergency department w/out an airway
- Glasgow Coma Scale ≤8, no endotracheal tube or surgical airway
- Head CT >2 hours after admission with GCS <14
- Laparotomy >1 hour w/ abdominal injuries and systolic blood pressure <90
- Massive blood transfusion (>3 units)
- Non-fixation of femoral diaphyseal fracture in adult
- Open fracture to OR >8 hours after admission
- Over triaged/trauma team activated unnecessarily
- Re-intubated within 24 hours of extubation
- Transferred out; length of stay >2 hours
- Under-triaged/trauma team not activated when criteria met
- Unscheduled return to the OR.

There is no ideal way to quickly and easily identify patients who are characterized by filters. Although some patients will be identified by querying the registry, most will need to be identified by abstracting the information from the patient record manually. The process of abstracting a chart may be assisted by employing the use of a trauma flow sheet to document the resuscitation. (See *Attachment I: Trauma Resuscitation Record*.) Many performance elements can be easily identified by abstracting this single record. Additionally, filters can be captured with the use of a tracking worksheet (see *Attachment Q: Trauma PI Filter Tracking Worksheet*). A worksheet is completed on every major trauma patient by abstracting the chart. If filters are identified, the chart is routed to the trauma PI team for review.

The Performance Improvement Loop

Performance improvement can be thought of as a continuous loop of activity surrounding a given issue. (See *Attachment R: Trauma PI Flowchart*.)

The three distinct phases of the PI loop are:
1) Recognition of the issue;
2) Corrective action; and
3) Evaluation of the result.

Recognition of the Issue: Enough data must be collected to identify a system or patient care issue. This may be a single occurrence of an event reported by a staff member or PI committee or it may be a recurrence of a similar or same event several times, which is discovered by chart abstraction or by a registry query.

For example: The trauma PI team routinely evaluates all trauma patients transferred. (To identify these patients, they might use the trauma registry to create an ad hoc report.) An expectation established by the hospital is that a trauma patient's condition is accurately assessed and the patient transferred to definitive care within two hours. The team discovers that 20 percent of these transfers occurred >2 hours after arrival.

The team then reviews the identified cases with the charge of determining why the patients' treatment did not meet the standard of care established by the facility. They may discover that, given the circumstances of the individual patients, the cases were managed as well as they could have been. However, the committee may identify a problem with a protocol, an individual provider or a system policy that contributed to the shortcomings.

For example:

- The committee discovers that the patients were transferred days after admission to their hometown hospitals after their conditions had stabilized. Therefore, there is no corrective action necessary.
- The committee finds that the transfers were initiated >2 hours after arrival when earlier CTs initially read by emergency department providers were reviewed by radiologists and found to reveal abnormalities requiring transfer to a facility with more resources.

Corrective Action: The problem can now be classified as disease-related, system-related or provider-related and referred, if necessary, to any another appropriate person or committee for review. Corrective action may be unnecessary or may consist of education, protocol revision, practitioner counseling, etc. The team should develop a corrective plan, consulting any in-house and out-of-hospital resources as necessary.

For example, the committee may recommend:

- Implementing a continuing education program for the emergency department providers to improve their CT scan interpretation capabilities.
- Making educational or reference resources available for interpreting CT scans to the emergency department providers.
- Employing the use of an off-site, 24-hour radiology service.

Evaluation of the Result: Once the corrective action is in place, the trauma program again collects data and the team determines whether or not the action corrected the problem. If it did, the loop is closed and the issue is resolved. If not, the committee revisits the case and repeats the PI process again.

Trauma Diversion

On rare occasions, critical resources needed to care for seriously injured patients become unavailable at one hospital due to an unusually great demand for those resources, a mechanical plant failure preventing the use of those resources or other event that renders resources unavailable or inaccessible. (More isolated hospitals that are a significant distance from their neighboring hospitals may not be able to safely divert trauma patients simply because of high patient volumes.) In such cases it is important that trauma center have a contingency plan to divert trauma patients to a nearby facility. (See *Attachment S: Sample Level III Trauma Diversion Protocol* and *Attachment T: Sample Level IV Trauma Diversion Protocol*.)

The decision to divert trauma patients should be carefully considered. It should only occur if, in the judgment of the lead medical staff person, it would be in the patient's best interest to be transported to a different facility rather than attempting to accomplish the resuscitation in an environment lacking critical resources. Trauma center should track both the number of times the

facility goes on divert and the number of patients diverted. (See *Attachment U: Trauma Divert Tracking Log*.)

Trauma Registry

The collection and use of data is of paramount importance to a successful trauma program: locally, statewide and nationally. A trauma registry is established primarily to ensure quality of care, but it has a secondary benefit of providing data for the surveillance of morbidity and mortality.

Trauma center are required to submit a number of data points to the Kentucky Trauma Registry system, and they will be periodically reported to the National Trauma Database (NTDB) system. Additionally, each hospital can design a unique data set to collect and analyze to further their PI objectives. (See Attachment V: Trauma Registry Inclusion Criteria.)

There are several commercial registries available for purchase, but the package considered must be compatible with the NTDB data dictionary, and must be able to transfer required data elements to the Kentucky Trauma Registry as required in 902 KAR Chapter 28. Trauma center utilizing their own registries must be able to submit data to the state trauma care system without duplicating data entry.

The Kentucky Injury Prevention Research Center (KIPRC), which operates the Kentucky Trauma Registry system, will be happy to advise the hospital on packages that are compatible with the system being used by the NTDB and the Kentucky Trauma Registry.

The function and purpose of the statewide trauma registry is threefold:

- To facilitate simple and accurate trauma data reporting to the state trauma program.
- To assist trauma center in identifying patients who match their filter characteristics via the report-generating features.
- To collect and report the state-required TBI/SCI data, eliminating the need to duplicate data submission.

The state trauma care system will submit your trauma data to the National Trauma Database (NTDB) on your behalf.

Technical assistance for the Kentucky Trauma Registry system is available through KIPRC.

Injury Prevention

While the vast majority of a hospital's trauma resources are committed to managing the injured patient, injury prevention cannot be ignored. A trauma hospital's injury prevention program may most effectively be incorporated into existing outreach activities. Ideally, prevention activities will be driven by epidemiological data for the community.

Technical and program assistance for injury prevention can be obtained through the *Kentucky Injury Prevention Research Center* (KIPRC).

Steps to Implementing a Prevention Activity

Recognize opportunities: Seek out existing public venues for your prevention activities such as school or church fairs and community events such as national night out.

Identify a desired outcome: The goal of the prevention activity may be to reduce the occurrence of a particular injury, raise awareness of a threat or hazard, increase knowledge of a subject or alter behaviors or attitudes.

Identify the target audience: Begin by determining what message you would like to communicate and who the recipients of that message should be. This may be driven by injury data—such as frequency, severity or location of a particular traumatic event within the community—where the audience is specific or by forum opportunity, such as a community fair, where the target audience is diverse.

Develop objectives: Describe the actions necessary to achieve the desired outcomes of the prevention activity. Consider staff and material resources needed, as well as program evaluation tools.

Develop strategies for reaching the targeted audience: Adults, adolescents and children all have different learning styles. By defining the target audience, the curriculum can be customized. For example, characters (such as Traumaroo™) appeal to children from ages 3 to 7. Children older than 7 relate well to video and slide presentations. Teenagers are most engaged when the forum allows them to voice their own viewpoints and opinions.

Obtain staff and funding for the activity: Do not limit yourself to hospital staff. Often, the goals of other community organizations coordinate well with injury prevention goals of the hospital. Consider the age and cultural dynamics of both the audience and the presenters. Sometimes coordinating the two can improve the effectiveness of the message. Trauma survivors or their family members can be powerful spokespeople. Funding may come from within the facility or from foundations, businesses, civic groups and government agencies.

Evaluate the effectiveness of the activity: Although effectiveness can be assessed by determining the number of people reached or by surveying program participants, ideally, effectiveness should be *measured* by evaluating whether or not the activity actually accomplished the desired outcome. Outcome evaluation should measure progress toward the goal of decreasing injury occurrence or changing the knowledge, attitude or behaviors of the target audience. Techniques may include data collection, surveying and direct observation.

Examples of prevention activities include:

- Bicycle helmet campaigns
- Bicycle rodeos
- Blood pressure screening
- Car seat clinics
- Domestic violence awareness
- Fall prevention
- Firearm safety
- Health fairs
- Intoxicated driving campaigns
- Posters/pamphlet publication
- Red light running campaigns

Required Equipment

Trauma center must have certain equipment capabilities for all ages of trauma patients. See *The American College of Surgeons "Resources for Optimal Care of Inured Patient" manual for Levels I thru III facilities,* and *Attachment W: Level IV Equipment Checklist* for a checklist that can be used to verify the existence of the minimum required equipment in your facility. To assist trauma center with care for children, the *American Academy of Pediatrics* has recommended the equipment and base medications listed in *Attachment X: Recommended Pediatric Equipment Capabilities Checklist*.

Individualized Consultation

If at any time you have questions about the trauma program and its requirements, contact the KyTAC program.

The KyTAC has committees that focus on key areas of trauma care system development, and would be glad to assist a facility with such things as:

- Application preview
- Assistance establishing or developing a PI or injury prevention program
- Documentation evaluation
- Examples of program policies, forms, tools
- Guidance regarding the existence or establishment of required criteria
- One-on-one consultation/guidance
- Pre-site visit consultation
- Telephone and in-person technical advice
- Web-based registry training

The KyTAC also encourages hospitals in the network "reach out" to partnering hospitals and EMS agencies in their region to provide assistance and technical support. It is part of the requirements for all levels of trauma centers to provide education and assistance to other hospitals and EMS agencies in their referral network. This is hopefully enhanced by the development of Regional Trauma Advisory Committees in the catchment areas of trauma centers at all levels.

The Kentucky trauma program is always eager to hear your feedback. If you have recommendations for resources that can be provided in this manual or elsewhere, please us.

Online Resources

Organizations
Kentucky Department for Public Health
http://chfs.ky.gov/

Kentucky Hospital Association
http://www.kyha.com/

Kentucky Board of EMS
http://kbems.kctcs.edu/

American College of Surgeons, Trauma Program
http://www.facs.org/trauma

Society of Critical Care Medicine
http://www.sccm.org/

American College of Emergency Physicians
http://www.acep.org/webportal

American Academy of Orthopedic Surgeons
http://www.aaos.org/

Trauma.org
http://www.trauma.org/

Emergency Nurses Association
http://www.ena.org/

Society of Trauma Nurses
http://www.traumanursesoc.org/

Brain Injury Association of America
http://www.biausa.org/

National Highway Traffic Safety Administration
http://www.nhtsa.gov/

Publications/Resources
ACS Trauma Publications
https://web2.facs.org/timssnet464/acspub/frontpage.cfm?product_class=trauma

Society of Critical Care Medicine Publications
http://www.sccm.org/

American Trauma Society
http://www.amtrauma.org/

Eastern Association for the Surgery of Trauma, Trauma Practice Guidelines
http://www.east.org/tpg.html

National Trauma Data Bank
http://www.facs.org/trauma/ntdb.html

American Academy of Experts in Traumatic Stress
http://www.aaets.org/

Gift from Within (Survivors of Trauma and Victimization)
http://www.giftfromwithin.org/

Pediatrics
American Academy of Pediatrics
http://www.aap.org/

Emergency Medical Services for Children (EMSC)
http://www.ems-c.org/

National Child Traumatic Stress Network
http://www.nctsn.org

Children's Safety Network
http://www.childrenssafetynetwork.org/

Prevention
Kentucky Injury Prevention and Research Center
http://www.kiprc.uky.edu/

The American Association for the Surgery of Trauma, Injury Prevention
http://www.aast.org/prevent.html

ATS Injury Prevention Programs
http://www.amtrauma.org/programs/programs.html

National Center for Injury Prevention and Control
http://www.cdc.gov/ncipc/

Helmets R Us
http://www.helmetsrus.net

BoosterSeat.gov
http://www.boosterseat.gov/

National Highway Traffic Safety Administration
http://www.nhtsa.dot.gov/

Safety Belt Safe U.S.A.
http://www.carseat.org/

Risk Watch
http://www.riskwatch.org/teacher.html

I Keep Safe (internet safety for kids)
http://ikeepsafe.org/

Attachment A: Sample Hospital Board Resolution

WHEREAS, traumatic injury is the leading cause of death for Kentuckians between the ages of 1 and 44 years; and

WHEREAS, [HOSPITAL] strives to provide optimal trauma care; and

WHEREAS, treatment at a trauma hospital that participates in a standardized system of trauma care can significantly increase the chance of survival for victims of serious trauma; and

WHEREAS, participation in the Kentucky Trauma Care System will result in an organized and timely response to patients' needs, a more immediate determination of patients' definitive care requirements, improved patient care through the development of the hospital's performance improvement program and an assurance that those caring for trauma patients are educationally prepared:

THEREFORE; BE IT RESOLVED that the board of directors of [HOSPITAL] resolve to provide the resources necessary to achieve and sustain a level [III or IV] trauma hospital designation.

IN WITNESS THEREOF, I have hereunto subscribed my name this Xst day of (month), 20XX.

_____

Chairman of the Board

Attachment B: Sample Medical Staff Resolution

WHEREAS, traumatic injury is the leading cause of death for Kentuckians between the ages of 1 and 44 years; and

WHEREAS, [HOSPITAL] strives to provide optimal trauma care; and

WHEREAS, treatment at a trauma hospital that participates in a standardized system of trauma care can significantly increase the chance of survival for victims of serious trauma; and

WHEREAS, participation in the Kentucky Trauma Care System will result in an organized and timely response to patients' needs, a more immediate determination of patients' definitive care requirements, improved patient care through the development of the hospital's performance improvement program and an assurance that those caring for trauma patients are educationally prepared:

THEREFORE; BE IT RESOLVED that the medical staff of [HOSPITAL] resolves to support the hospital's trauma program and to provide trauma care commensurate with the standards published by the Kentucky Statewide Trauma Care System for level [**X**] trauma center.

IN WITNESS THEREOF, I have hereunto subscribed my name this **X**st day of (month), 20**XX**.

_____

Chief of Staff

Attachment C
Sample Trauma Services Medical Director Job Description

Job Title: Trauma Services Medical Director

Reports to: Chief of Medical Staff

Qualifications:

1. Board certified in Family Medicine, Emergency Medicine, Internal Medicine or General Surgery.
2. Member in good standing of the hospital medical staff or emergency medicine staff.
3. Currently licensed to practice medicine in Kentucky.
4. Currently certified in Advanced Trauma Life Support (ATLS).
5. Three years clinical experience in emergency/trauma care.
6. Two years administrative experience.
7. Ability to establish and maintain effective interpersonal relationships.
8. Ability to accept and implement change.
9. Ability to problem solving make decisions.
10. Demonstrated history of positive collegial relations with colleagues, support staff, hospital-based providers, administrators and patients.

Nature and Scope: The Trauma Services Medical Director is responsible for the ongoing development, growth and oversight/authority of the Trauma Program. He/she must be able to demonstrate effective interpersonal skills and an understanding of the interdependent roles of various allied health professions. The Trauma Services Medical Director is responsible for promoting high standards of practice through development of trauma policies, protocols and practice guidelines; participating in rigorous performance improvement monitoring; resident and staff education and trauma research. He/she has authority to act on all trauma performance improvement and administrative issues and critically review trauma deaths and complications that occur within the hospital. Decisions affecting the care of trauma patients will not be made without the knowledge, input and approval of the Trauma Services Medical Director.

Principal Duties and Responsibilities:

Administration:

- Participate in the research, development and writing of trauma policies, protocols and practice guidelines.
- Implement all trauma program policies and procedures as they pertain to patient care.
- Organize, direct and integrate the trauma program with all other departments and services within the hospital.
- Promote a cooperative and collaborative working environment among the clinical disciplines involved in trauma care.
- Maintain an effective working relationship with the medical staff, trauma service staff, administration and other departments.
- Provide advice and direction in recommending privileges for the trauma service.
- Participate in trauma program marketing activities.

- Establish a physician case management process that fosters cost-effective, high quality patient care.
- Assess need for equipment, supplies, budget
- Assist the Trauma Program Manager in developing and meeting the trauma program budgetary goals.
- Oversee, participate in and develop projects that ensure the cost-effectiveness of care provided by physicians and hospital.

Program Initiatives:

- Lead efforts to develop and maintain a trauma center.
- Collaborate with the Trauma Program Manager to establish trauma program goals and objectives consistent with those of the hospital and ensure that those of the trauma program are being met.
- Develop and provide input on the development and maintenance of practice guidelines, policies and methodologies for medical/surgical trauma care.
- Participate in site review by regulatory agencies.
- Organize, direct and implement departmental practices to assure continued compliance with applicable laws including the guidelines established by the Kentucky Trauma Care System.
- Demonstrate positive interpersonal relationship with colleagues, referral MDs, hospital personnel, and patients/families in order to achieve maximum operational effectiveness and customer satisfaction.
- Assure transfer agreements in place and in good standing; maintain relationship with receiving facilities, foster collaborative relationship.
- Make appropriate referrals for specialty services and communicate regularly with referring physician as appropriate.
- Assume clinical responsibility for all trauma patients.
- Ensure that adequate attending physician availability is provided to render care to trauma patients.
- Ensure establishment of physician/surgeon call schedules for all trauma care, excluding those who do not meet educational and credentialing requirements.
- Provide trauma care leadership and consultation for emergency, surgery and intensive care unit departments.
- Participate in regional and statewide activities affecting the trauma program.
- Attend local and national meetings and conferences to remain current regarding issues relevant to the performance of duties.
- Demonstrate consistent, efficient, cost effective and quality trauma care at all times.
- Participate in trauma patient/family satisfaction projects as developed by hospital.

Performance Improvement:

- Determine and implement PI activities appropriate to the trauma program.
- Oversee the trauma PI program and participate in other quality initiatives that deal with the care of injured patients.
- Review and investigate all trauma PI inquiries in collaboration with the Trauma Program Manager and refer to the appropriate committees.
- Monitor compliance with trauma treatment guidelines, policies and protocols.
- Assure that the quality and appropriateness of patient care are monitored and evaluated and that appropriate actions based on findings are taken on a consistent basis.

- Report quality of care issues promptly to appropriate individuals, including Trauma Program Manager and hospital administration.
- Identify and correct deficiencies in trauma care policies, guidelines and protocols.
- Consult with appropriate medical staff and administration regarding quality care issues and adverse outcomes; identify areas to improve patient care.
- Assure that continuum of care is maintained.
- Identify representatives from various disciplines appropriate to participate in PI activities.
- Coordinate, schedule and facilitate the PI peer review process.
- Chair the Morbidity and Mortality Committee meeting and the Multidisciplinary Trauma Conference.
- Review all trauma-related peer review and initiate action as necessary.
- Assist the Trauma Program Manager in evaluating the effectiveness of corrective actions resulting from PI processes.
- Assume responsibility for the accuracy and validity of trauma statistics.

Clinical Education:

- Support the requirements for trauma CME by participating and assisting in the education and training of hospital personnel physicians and specialists.
- Provide education for hospital staff regarding trauma program policies and appropriate medical practices.

Community Outreach:

- Maintain relations with community organization and legislative bodies whose activities relate to trauma care and injury prevention
- Participate in hospital outreach activities as may be requested by administration.
- Develop and participate in trauma community education and injury prevention activities.
- Function as a liaison to other hospitals within the region.

Knowledge and Skill:

- Lead the hospital in program development.
- Oversee the clinical practice of medical staff.
- Analyze and interpret complicated information.
- Determines a course of action based on research, data, standards of care and general guidelines/protocols.
- Communicate effectively with a wide variety of intra- and inter-facility staff and administration using both oral and written communication.
- Possess critical thinking, analytical, teaching/coaching and research skills.

Attachment D
Sample Trauma Program Manager/Coordinator Job Description

Job Title: Trauma Program Manager

Reports to: Director of Nursing

Qualifications:
1. Bachelor's degree
2. Currently licensed as registered nurse in Kentucky.
3. Currently certified in TNCC.
4. Three years clinical experience in trauma/emergency care.
5. Ability to establish and maintain effective interpersonal relationships.
6. Ability to accept and implement change.
7. Ability to problem solving make decisions.
8. Possession of critical thinking, analytical, teaching/coaching and research skills.

Nature and scope: The Trauma Program Manager (TPM) is responsible for developing, implementing and maintaining a cost-effective system of care for trauma patients and their families throughout the continuum of care. The TPM works both independently and in collaboration with the trauma services medical director and other members of the health care team and the management staff. The TPM is self-directed and self-motivating, plans and conducts work with minimal direction, and reports the progress of work to the director of nursing.

Principal Duties and Responsibilities:
Administration:
- Support and adhere to hospital policies, procedures, philosophy and mission.
- Produce and manage the trauma program budget.
- Interpret and implement policies and procedures; make recommendations for revisions; assist with updating policies and procedures.
- Participate in the development and planning of goals and objectives related to trauma care.
- Coordinate with the trauma services medical director, hospital administration and clinicians to assess the need for policies, procedures and protocols relating to the care of trauma patients.
- Develop policies and procedures based on current literature, input from clinicians and other sources such as information from patient care evaluations.
- Represent the Trauma Program on various hospital and community committees to enhance and foster optimal trauma care management.
- Participate in the budget process: anticipate trends, future needs of the trauma program.
- Work with a broad array of department to resolve inefficiencies and reduce costs
- Supervise adherence to hospital policies and procedures and standards through observation, medical record review, staff feedbacks and other appropriate sources.
- Serves as a liaison to administration, representing the Trauma Program on various hospital and community committees to enhance and foster a fiscally sound Trauma Program.
- Monitor trauma care financial reimbursement issues.

Program Initiatives:

- Implement program initiatives.
- Monitor and maintain compliance with statewide trauma care system regulatory requirements.
- Coordinate preparation for statewide trauma care system designation site visit.
- Develop and foster collaborative relationships with all hospital departments to facilitate and support quality trauma care.
- Participate in state and regional trauma care activities
- Monitor national and statewide trends in trauma care.
- Respond to trauma team activations that occur during work hours; function in whatever role necessary to assist the team in the care of the patient.
- Serve as a resource for the hospital staff regarding trauma care issues.
- Plan and implement strategies for ongoing trauma program development and improvement.
- Monitor state and national trends in trauma care.
- Collaborate with the trauma services medical director, physicians and other health care professionals to provide clinical and system oversight for the care of trauma patients, ensuring the provision of efficient, quality, cost-effective care.

Performance Improvement:

- Assess and improve departmental performance.
- Maintain quality control programs and participates in the organization's overall quality control program.
- Monitor performance of hospital staff involved with the care of trauma patients.
- Monitor trauma patient outcomes; evaluate for trends.
- Coordinate with physicians, nurses, other in-hospital staff and outside providers to evaluate and address specific patient care issues.
- Participate in case review.
- Assist the trauma services medical director and hospital administration in the development, implementation and evaluation of a quality plan which is multi disciplinary and patient-outcomes focused.
- Serve as the coordinator for the identification, investigation, reporting and follow up of incidents and quality issues throughout the program while maintaining confidentiality.
- Monitor the trauma team's availability and compliance with policies and standards.
- Develop and monitor the trauma PI program in collaboration with the trauma services medical director.
- Coordinate and schedule the morbidity and mortality committee and multidisciplinary review meetings.
- Assist in data collection related to the trauma patient.
- Analyze registry data on the trauma patient population; identify trends for strategic planning and performance improvement.
- Manage registry data: collect, analyze and trend.
- Supervise the collecting, coding, scoring and developing of processes for validation of data entered into the registry.
- Ensure accurate data entry into the trauma registry.
- Ensure the maintenance of the trauma registry in collaboration with the trauma registrar.
- Ensure the periodic reporting of trauma data to the state trauma program.
- Facilitate the measurement of selected outcomes for the trauma patient population.

Clinical Education:

- Plan, coordinate and evaluate trauma-related educational programs for nursing staff.
- Monitor physician and nurse compliance with the educational requirements of the trauma program.
- Ensure staffs involved in the care of trauma patients meet educational requirements of the trauma program.
- Develop, coordinate and implement orientation, nursing education, and in-service programs related to care and management of trauma patients.
- Seek and pursue opportunities for internal and external trauma-related educational programs for hospital staff.

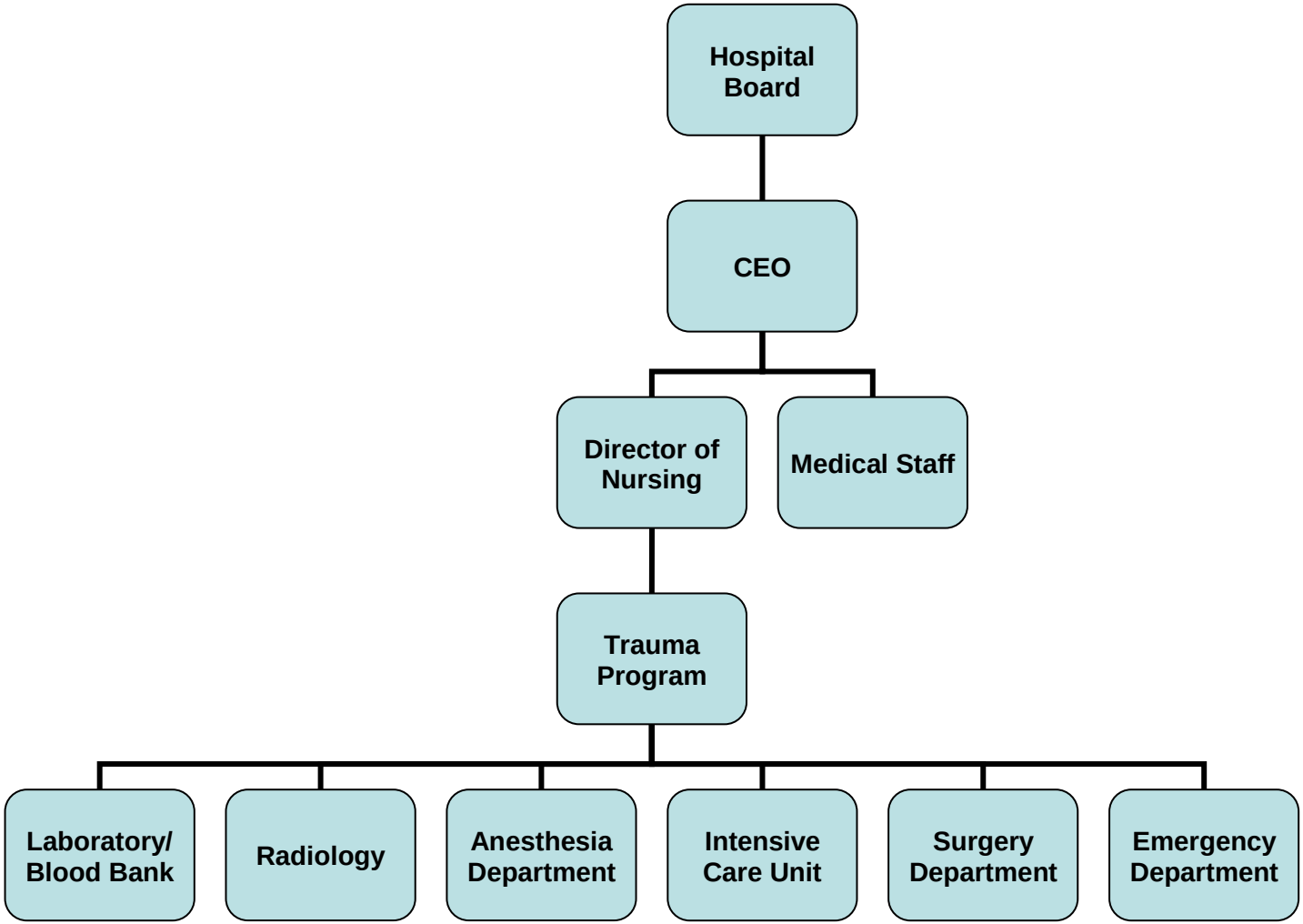
Community Outreach:

- Coordinate and oversee the development and implementation of an injury prevention program.
- Direct community trauma education and prevention programs by developing, implementing and evaluating programs for targeted populations in the community related to injury prevention and other topics identified through needs assessment of the community.
- Develop and implement strategies for communication, education and feedback for EMS systems in the catchment area.
- Identify opportunities for injury prevention programming in the local communities.
- Plan, coordinate and collaborate with community representatives to accomplish injury prevention activities.
- Evaluate the impact of injury prevention activities.
- Seek and pursue opportunities for internal and external trauma-related educational programs for hospital staff, patients, families and the community.

Knowledge and Skill:

- Analyze and interpret complicated information.
- Determine a course of action based on research, data, standards of care and general guidelines/protocols.
- Communicate effectively with a wide variety of intra- and inter-facility staff and administration using both oral and written communication.

Attachment E: Suggested Position of Trauma Program



Attachment F: Sample Single-Tier Trauma Team Activation (TTA) Protocol

Purpose:
A team must be rapidly assembled to provide for the initial evaluation and resuscitation of major trauma patients in an organized and efficient manner.

Policy:
The team is a multi-disciplinary panel of professionals assembled in an organized fashion to perform the tasks necessary to efficiently resuscitate seriously injured patients.

The activation criteria are as follows:

1) Activate trauma team upon realization that any of the following patient conditions exists, either upon arrival of the patient or notification by EMS.

   Adult or pediatric trauma patient and presenting with:

   - Altered level of consciousness: GCS ≤13 or less than A on AVPU scale
   - Respiratory distress/airway compromise, intubation:
   - Shock/diminished perfusion:
     - adult BP <90, HR>120
     - child

Age	BP	HR
≤ 6	<90	<60 or >160
2-5	<80	<60 or >180
12-24 months	<75	<70 or >180
0-12 months	<70	<80 or >180

   - Penetrating wound to the abdomen, neck, or chest
   - Severe facial injuries
   - Traumatic paralysis
   - Severe burns
   - Severe orthopedic injuries
   - Death in same passenger compartment
   - Fall >20 feet
   - Ejection from auto
   - Physician discretion

Trauma team members:

1) Emergency department provider (e.g., physician, nurse practitioner or physician assistant)
2) Two emergency department RNs
3) Nursing assistant or EMT
4) Laboratory technician
5) Radiologic Technologist
6) Health Unit Coordinator (HUC)

The individual roles of the team members are subject to change based on the needs of the patient and resources available during the resuscitation. Below is a guideline. The provider

leading the resuscitation may modify the duties of any team member if in the best interest of the patient.

Emergency Department Provider:

- Perform primary and secondary survey.
- Perform or delegate airway management.
- Perform procedures as needed such as chest tube insertion, central venous access, ultrasound exam.
- Order appropriate lab and radiographs.
- Responsible for all medications and fluids given.
- Make triage and transfer decisions.
- Determine the need for and mode of inter-facility transfer (air vs. ground) early in resuscitation course.
- Communicate directly with receiving physician at trauma hospital regarding transfer.
- Document case (complete trauma flow sheet, dictate emergency department note).
- Complete and sign patient transfer form.

Emergency Department Nurses

- Prepare trauma room before the patient arrival.
- Place X-ray trauma blocks on the gurney.
- Assist EMS with transfer from EMS gurney to trauma bed.
- Attach BP, cardiac and oximetry monitors to the patient.
- Obtain initial vital signs and report out loud to emergency department provider. (BP, HR, RR, SpO_2 and temp (Core temp if hypothermia is considered).
- Maintain and monitor all intravenous lines. Obtain fluid resuscitation orders and IV rate from emergency department provider. Report to recorder (at end of emergency department course) total IV intake and urine output.
- Set up fluid and blood warmer. Start blood transfusion as ordered.
- Remain at patient bedside throughout the emergency department course.
- Assist with equipment preparation before the patient arrives.
- Assist with transfer from the EMS gurney to the trauma bed.
- Assist in removing patient's clothing.
- Draw up and label airway drugs (succinylcholine, Etomidate, etc.). Be prepared to administer drugs as ordered by the emergency department provider.
- Obtain IV access if needed. (If primary IV is done, place 2nd IV and draw bloods).
- Inserts Foley catheter when authorized by the emergency department provider.
- Set up chest tube drainage system if needed.
- Assist emergency department provider with procedures as needed.
- Administer tetanus booster and antibiotics when ordered by emergency department provider.
- Initially document emergency department course by filling out the trauma resuscitation record.
- Record vital signs initially and every 5 minutes; make sure that provider in charge is aware of any significant changes in the patient's status.
- Accompany patient out of department for any diagnostic procedures.
- Control traffic in the trauma room; attentive to patient's privacy, e.g., keep curtains closed, keep other patients and family members away from traffic areas.
- Communicate with family.
- Escort family members to trauma room and attend them when appropriate.

Nursing Assistant or EMT

- Assist with transfer from the EMS gurney to the trauma bed.
- Assist in removing patient's clothing; covers patient immediately with warm blankets.
- Assist with intubation: provide in-line cervical spine immobilization or Sellick's maneuver as directed.
- Assist with procedures as needed.
- Assist with transport of patient to X-ray.
- Check airway equipment before the patient's arrival. (i.e., suction, laryngoscopes, ambu bag, O_2)
- Maintain oxygen; insure SpO_2 unit functions properly; assist ventilation with BVM as necessary and as directed by emergency department provider.

Laboratory Technician

- Obtain pre-labeled blood tubes from trauma room; attach ID bracelet to patient.
- Obtain syringes from IV start (by RN) or perform venipuncture to obtain blood for trauma battery.
- Determine availability of blood; bring O negative blood to trauma room immediately if requested.
- Run phase 1 and phase 2 labs, if necessary. (see below)
- Obtain urine from Foley insertion and run UA on all patients. Run urine HCG on all females in reproductive age group.
- Run ABGs.
- Insure type specific blood is available in blood bank.
- Perform ECG if requested.

Radiologic Technologist

- Respond immediately to trauma team activation page; transfer portable x-ray machine to trauma room, insure enough film plates for basic trauma radiographs (e.g., lateral c-spine, chest, pelvis).
- Place chest plate on trauma cart under backboard before patient arrives.
- Determine radiographic priorities per physician in charge.
- Ensure at least 2 additional aprons are in trauma room and available for emergency department staff.
- Develop films and immediately take them to the trauma room.
- Inquire if CT will be needed; call in/notify CT tech to prepare for emergency scan.
- Copy radiographs if patient will be transferred; ensure originals accompany the patient.

Health Unit Coordinator (HUC)

- Activate trauma team upon notification of TTA for the field; confirm all team members have arrived. Record arrival times.
- Determine if additional medical staff will be needed.
- Contact receiving trauma hospital as directed by emergency department provider.
- Assemble and copy all documentation for transport team, e.g., chart, labs, x-ray.
- Direct family members to family support person.
- Prepare patient transfer forms and obtain emergency department provider signature if patient is transferred.
- Request security to secure the helicopter landing pad.
- Meet family members; escort them to the family consultation room.

- Offer to contact others, e.g., family, friends, or clergy.
- Authorize food services to provide refreshments to family members as necessary.
- If the patient is transferred, ensure that family members have transportation and directions to receiving facility.

Procedure:

a. The emergency department nurse, emergency department provider or EMS becomes aware of a patient meeting TTA criteria and instructs the operator to call a level 1 or 2 TTA. Call a TTA upon receipt of notification that the incoming patient's condition meets the TTA criteria. Do not wait for the patient to arrive in the emergency department before activating the team.
b. The HUC pages overhead *"Level [1 or 2] Trauma Team Stat, [ETA],"* a total of 3 times.
c. Team members assemble in the emergency department immediately.
d. The emergency department provider team leader briefs the team on the condition of the patient and begins to assign duties.
e. The team leader should immediately consider the need to transfer the patient and activate the trauma transfer protocol, if indicated.

Guiding Principles:

- Transfers should not be delayed to perform laboratory studies. Trauma lab panels, if necessary, should only be performed if they are going to be acted upon locally. Lab studies might include:
  - Heme profile
  - PT/INR
  - PTT
  - Basic metabolic
  - Alcohol
  - Type and screen
  - Arterial blood gases
  - Pregnancy test (serum or urine) on all females in reproductive age group
  - UA
  - Urine tox. screen
- Personal Protective Equipment (PPE) should be worn by all personnel who work directly with the patient.
  - Gowns
  - Gloves
  - Masks to include eye shields
  - Shoe covers, surgical caps
  - Lead aprons
- Keep talking and noise to a minimum. Discuss the patient's condition only behind closed doors and after ensuring a private environment.
- Keep doors and curtains closed. Vigilantly maintain the patient's privacy. Encourage other patients and family members to stay in their cubicles during the resuscitation.
- Ensure that the patient is informed of procedures before they are performed. Continuously ascertain the patient's comfort level (e.g., pain, temperature).
- Verbally acknowledge orders; inform the source when the request has been completed; when giving orders, ensure their receipt.
- Stand in an area removed from the patient until called upon or dismissed, if not directly involved in patient care.

- Select proximal sites for peripheral IVs, when possible; they may need to be converted to rapid infusion catheters.
- Vacate the room when X-rays are being taken unless fitted with a lead apron.
- Place the patient's clothing and belongings into labeled bags as soon as possible.

Attachment G: Sample Multi-Tier Trauma Team Activation (TTA) Protocol

Purpose:
A team must be rapidly assembled to provide for the initial evaluation and resuscitation of major trauma patients in an organized and efficient manner.

Policy:
The team is a multi-disciplinary panel of professionals assembled in an organized fashion to perform the tasks necessary to efficiently resuscitate seriously injured patients.

The activation criteria are as follows:

1) Level 1 activation: Activate the Level 1 Trauma Team upon realization that any of the following conditions exist, either upon arrival of the patient or notification by EMS.

   Adult or pediatric trauma patient and presenting with:

   - Altered level of consciousness: GCS ≤8 secondary to trauma or less than V on AVPU scale.
   - Respiratory distress/airway compromise, intubation:
     - Adult RR <10 or >30
     - Child

Age	RR
≤6	<10 or >30
2-5	<10 or >40
12-24 months	<10 or >50
0-12 months	<10 or >60

   - Shock/diminished perfusion:
     - Adult BP <90, HR>120
     - Child

Age	BP	HR
≤ 6	<90	<60 or >160
2-5	<80	<60 or >180
12-24 months	<75	<70 or >180
0-12 months	<70	<80 or >180

   - Severe multiple injuries (two or more systems) or severe single system injury.
   - Cardiac or major vessel injuries.
   - Transferred patients from other hospitals receiving blood to maintain vital signs.
   - Penetrating wound to the abdomen, neck or chest.
   - Unstable pelvic fracture.
   - Severe facial injuries.
   - Physician discretion.

2) Level 2 activation: Activate the Level 2 Trauma Team upon realization that any of the following conditions exist, either upon arrival of the patient or notification by EMS.

   Adult or pediatric trauma patient and presenting with:

   - GCS >8 and <14 secondary to trauma.
   - Severe burns.

- Cardiac or respiratory disease.
- Co-morbid factors:
    - Insulin-dependent diabetes.
    - Morbid obesity.
    - Age <5 or >55 years.
- Severe orthopedic injuries.
- Injuries with complications (e.g., shock, sepsis, respiratory failure, cardiac failure).
- Traumatic paralysis.
- Death in same passenger compartment.
- Fall >20 feet.
- Ejection from auto.
- Pregnancy >20 weeks.
- Combination trauma with burns.
- Physician discretion.

For each level of activation, the trauma team members are:

1) Level 1 activation
    i) Emergency physician* (present within 15 minutes of patient's arrival)
    ii) General surgeon (present within 30 minutes of patient's arrival)
    iii) Two emergency department RNs*
    iv) Nursing supervisor
    v) Emergency department tech or EMT
    vi) Respiratory therapy
    vii) Anesthesia
    viii) Laboratory technician
    ix) Radiologic Technologist
    x) Emergency department HUC
    xi) Security
    xii) Social services or chaplain
    *Note one physician and two RNs per critical patient
2) Level 2 activation
    i) Emergency physician* (present within 15 minutes of patient's arrival)
    ii) Two emergency department RNs*
    iii) Nursing supervisor
    iv) Emergency department tech or EMT
    v) Radiologic Technologist
    vi) Laboratory technician
    vii) Emergency department HUC
    viii) Security
    *Note one physician and two RNs per critical patient

The individual roles of the team members are subject to change based on the needs of the patient and resources available during the resuscitation. Below is a guideline. The physician leading the resuscitation may modify the duties of any team member if in the best interest of the patient.

<u>Emergency physician and general surgeon</u>

- Perform primary and secondary survey.
- Perform or delegate airway management.
- Perform procedures as needed such as chest tube insertion, central venous access, ultrasound exam.

- Order appropriate lab and radiographs.
- Responsible for all medications and fluids given.
- Make triage and transfer decisions.
- Determine mode of inter-facility transfer (air vs. ground).
- Communicate directly with receiving physician at trauma hospital regarding transfer.
- Document case (complete trauma flow sheet, dictate emergency department note).
- Complete and sign patient transfer form.
- Coordinate priorities when more than one critical patient in the emergency department.

Emergency Department Nurses

- Prepare trauma room before the patient arrival.
- Place X-ray trauma blocks on the gurney.
- Assist EMS with transfer from EMS gurney to trauma bed.
- Attach BP, cardiac and oximetry monitors to the patient.
- Obtain initial vital signs and report out loud to emergency department physician and critical care nurse. (BP, HR, RR, SpO_2 and temp (core temp if hypothermia is considered).
- Maintain and monitor all intravenous lines. Obtain fluid resuscitation orders and IV rate from emergency department physician. Report to recorder total IV intake and urine output at end of emergency department course.
- Set up fluid and blood warmer. Start blood transfusion as ordered.
- Remain at patient's bedside throughout the emergency department course.
- Remove patient's clothing.
- Draw up and label airway drugs (succinylcholine, Etomidate, etc.). Be prepared to administer drugs as ordered by the emergency department physician.
- Obtain IV access if needed. (If primary IV is done, place second IV and draw bloods)
- Insert Foley catheter when authorized by the emergency department physician.
- Set up chest tube drainage system if needed.
- Assist physician with procedures as needed.
- Administer tetanus booster and antibiotics when ordered by emergency department physician.
- Initially document emergency department course by filling out the trauma resuscitation record.
- Record vital signs initially and every five minutes; make sure that physician in charge is aware of any significant changes in the patient's status.
- Accompany patient out of department for any diagnostic procedures.
- Accompany patient to ICU, report off to ICU staff.

Nursing Supervisor

- Assess staffing needs; delegate additional nursing staff as required to attend trauma patient or others in the emergency department.
- Ensure all team members are wearing appropriate protective equipment (see below).
- Monitor activities of the trauma team.
- Control traffic in the trauma room; attentive to patient's privacy, e.g., keep curtains closed, keep other patients and family members away from traffic areas.
- Assist others with equipment and procedures as needed.
- Communicate with family in collaboration with family support staff member.
- Escort family members to trauma room and attend them when appropriate.

Emergency Department Technician (or EMT)

- Assist with transfer from the EMS gurney to the trauma bed.
- Assist in removing patient's clothing; cover patient immediately with warm blankets.
- Assist with intubation: provide in line cervical spine immobilization or Sellick's maneuver as directed.
- Assist with procedures as needed.
- Assist with transport of patient to CT scanner.

Respiratory Therapist (When not available a paramedic may take the place of RT.)

- Check airway equipment before the patient's arrival (e.g., suction, laryngoscopes, Ambu bag, O_2).
- Maintain oxygen; ensure SpO_2 unit functions properly; assist ventilation with BVM as necessary and as directed by emergency department physician.
- Assist with intubation; perform Sellick's maneuver after paralytic is given; ensure that in-line cervical spine immobilization is delegated for the intubation.
- Check tube placement after intubation with esophageal detector device, attach end tidal CO_2 monitor and secure ET tube.
- Ventilate patient; set up transport ventilator if necessary.
- Monitor end tidal CO_2 and SpO_2.
- Draw ABGs if requested.

Anesthesia (CRNA or MDA)

- Initially assist with airway management as directed by physician in charge.
- Assist with vascular access (peripheral or central).
- Assist with ventilation if respiratory therapy unavailable (if RT not in house).
- Serve as team leader for an individual patient when emergency department physician unavailable.
- Place NG or OG tube as directed by physician in charge.

Laboratory Technician

- Obtain pre-labeled blood tubes from trauma room; attach ID bracelet to patient.
- Obtain syringes from IV start (by RN) or perform venipuncture to obtain blood for trauma battery.
- Determine availability of blood; bring O negative blood to trauma room immediately if requested.
- Run phase 1 and phase 2 labs (see below).
- Obtain urine from Foley insertion and run UA on all patients. Run urine HCG on all females in reproductive age group.
- Run ABGs.
- Ensure type specific blood is available in blood bank.
- Perform ECG if requested.

Radiologic Technologist

- Respond immediately to trauma team activation page; transfer portable X-ray machine to trauma room, ensure enough film plates for basic trauma radiographs (e.g., lateral c-spine, chest and pelvis).
- Place chest plate on trauma cart under backboard before patient arrives.
- Obtain radiographic priorities from physician in charge.
- Ensure at least two additional aprons are in trauma room and available for emergency department staff.
- Develop films and immediately take them to the trauma room.
- Inquire if CT will be needed; call in/notify CT tech to prepare for emergency scan.

- Copy radiographs if patient will be transferred; ensure originals accompany the patient.

Health Unit Coordinator (HUC)
- Activate trauma team upon notification of TTA; confirm all team members have arrived and record arrival times.
- Determine if additional medical staff will be needed.
- Contact receiving trauma hospital as directed by emergency department physician.
- Assemble and copy all documentation for transport team, e.g., trauma flow sheet, chart, labs, X-ray.
- Direct family members to family support person.
- Prepare patient transfer forms and obtain emergency department physician signature if patient is transferred.

Security
- Assist with procedures during resuscitation.
- Secure helicopter landing pad and assist flight crew with equipment.
- Assist with transportation of the patient to CT or helipad as needed.

Family Support Person (Social Services, Chaplain or Nursing Supervisor)
- Meet family members; escort them to the family consultation room.
- Offer to contact others, e.g., family, friends or clergy.
- For pediatric resuscitations, accompany parents into the trauma room; attend them continuously.
- Authorize food services to provide refreshments to family members as necessary.
- If the patient is transferred, ensure that family members have transportation and directions to receiving facility.
- In the case of patient's death, assist with contacting funeral service.

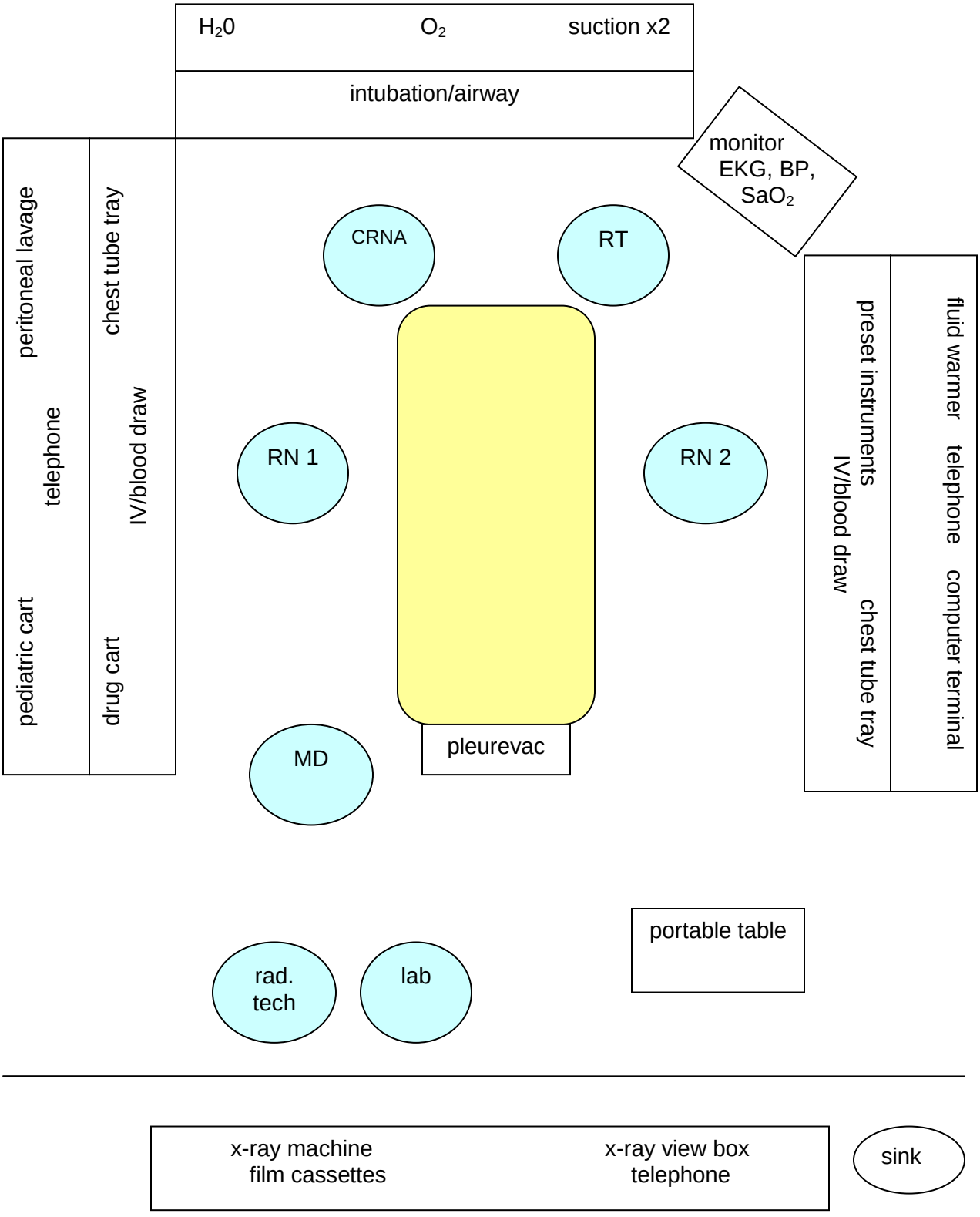
Back up physicians (non-emergency department physician called in to assist with multiple casualties)
- Assist with procedures as delegated by the physician in charge.
- Assume responsibility for additional trauma patients or other emergency department patients as directed by physician in charge.
- Inform physician in charge of findings, patient progress; consult regarding treatment/triage/transfer plans.

Procedure:
1. The emergency department nurse, emergency department physician or EMS becomes aware of a patient meeting TTA criteria and instructs hospital operator to call a level 1 or 2 TTA. Call a TTA upon receipt of notification that the incoming patient's condition meets the TTA criteria. Do not wait for the patient to arrive in the emergency department before activating the team.
2. The operator pages overhead "Level [1 or 2] Trauma Team Stat, [ETA]," a total of 3 times.
3. Team members assemble in the emergency department immediately.
4. The physician team leader briefs the team on the condition of the patient and begins to assign duties.
5. The physician team leader should immediately consider the need to transfer the patient and activate the trauma transfer protocol, if indicated.

Guiding Principles:

- Transfers should not be delayed to perform laboratory studies. Trauma lab panels, if necessary, should only be performed if they are going to be acted upon locally. Lab studies might include:
    - Heme profile
    - PT/INR
    - PTT
    - Basic metabolic
    - Alcohol
    - Type and screen
    - Arterial blood gases
    - Pregnancy test (serum or urine) on all females in reproductive age group
    - UA
    - Urine tox. screen
- Personal Protective Equipment (PPE) should be worn by all personnel who work directly with the patient.
    - Gowns
    - Gloves
    - Masks to include eye shields
    - Shoe covers, surgical caps
    - Lead aprons
- Keep talking and noise to a minimum. Discuss the patient's condition only behind closed doors and after ensuring a private environment.
- Keep doors and curtains closed. Vigilantly maintain the patient's privacy. Encourage other patients and family members to stay in their cubicles during the resuscitation.
- Ensure that the patient is informed of procedures before they are performed. Continuously ascertain the patient's comfort level (e.g., pain, temperature).
- Verbally acknowledge orders; inform the source when the request has been completed; when giving orders, ensure their receipt.
- Stand in an area removed from the patient until called upon or dismissed, if not directly involved in patient care.
- Select proximal sites for peripheral IVs, when possible; they may need to be converted to rapid infusion catheters.
- Vacate the room when X-rays are being taken unless fitted with a lead apron.
- Place the patient's clothing and belongings into labeled bags as soon as possible.

Attachment H: Sample Trauma Bay Configuration



Attachment I: Trauma Resuscitation Record

On the next four pages is a sample form, originally developed for the Minnesota Trauma System, which can be used as an internal model to capture key data elements. It is not required, and is provided only as an example for reference.

Patient Tag/Sticker

Date of Birth

Gender

Medical Record #

Patient Name

Admit Date / /

Arrival Time :

Trauma Team Notification/Arrival

Trauma Team Activated? ☐Yes ☐No Time: :

Name		Time called	Time arrived	Present upon Pt arrival?
Trauma Surgeon		:	:	☐Yes ☐No
ED Physician		:	:	☐Yes ☐No
Anesthesia		:	:	☐Yes ☐No
		:	:	☐Yes ☐No

Arrived via:
☐Ambulance
☐Helicopter
☐Police
☐Self
☐
☐Transfer from:

☐EMS report in Pt chart

Pre-hospital Interventions
Airway:
☐Oral ☐Nasal ☐Intubated ☐O_2
☐IV size _____ site _____
☐IV #2 size _____ site _____
☐Blood sugar _____ mg/dl
☐CPR ☐LBB ☐C collar ☐MAST
☐Splint type _____ location _____
Meds:
☐Morphine _____ mg ☐Versed _____mg
☐_____ _____mg

Pt. Medications
☐unknown

Past History
☐unknown
last tetanus_____
last P.O._____

Allergies
☐unknown

Mechanism of Injury

Motor Vehicle

Involved:
☐Auto
☐Light truck
☐Heavy truck
☐Motorcycle
☐ATV
☐Bicycle
☐Pedestrian
☐Watercraft
☐Sporting _____

Patient was:
☐Driver
☐Passenger-front
☐Passenger-back
☐Pedestrian struck by auto
☐Bicyclist struck by auto
☐Unknown

☐Seatbelt
☐Airbag
☐Child seat
☐Helmet

☐Ejected
☐Extrication
☐Death of another occupant

Impact:
☐Front
☐Side
☐Rear
☐Rollover
☐T-bone

Fall/Jump
Approx. height:
_____
Landing surface:
☐Grass/dirt/earth
☐Stone
☐Concrete/brick
☐Tile/wood
☐Carpet
☐Water
☐

Burn
☐Flame
☐Steam
☐Chemical
☐Radiation
☐Inhalation
☐Electrical
voltage:_____

Penetrating
☐GSW
caliber_____
distance_____
☐Stab
blade length_____
☐Self inflicted
☐Impalement

Primary Survey and Preliminary Interventions

Airway

☐Patent/talking
☐Clear
☐Partially obstructed
☐Completely obstructed
☐Breathing assisted
☐Intubated
☐EOA/Combitube

☐Jaw thrust
☐Suction
☐Foreign object removal/laryngoscopy
☐Oral airway
☐Nasal airway
☐Combitube/LMA
time: ____:____

☐Intubation ☐RSI
tube size_____
time:____:____
_____cm @ _____
#attempts:_____
☐Confirmed by:
☐End tidal CO_2
☐Aspirator
☐CXR

Breathing

☐Spontaneous
☐Labored
☐Agonal
☐No effort

Trachea:
☐Midline
☐Deviated ☐R ☐L

Chest wall symmetry:
☐Symmetrical
☐Asymmetrical

Lung sounds:
L R
☐ ☐Present
☐ ☐Clear
☐ ☐Diminished
☐ ☐Absent
☐ ☐Rales
☐ ☐Rhonchi
☐ ☐Wheezes

Assisted:
☐BVM
☐Ventilator
Vent. Rate _____

Supplemental O_2
☐Mask
☐NC
_____ l/m

Initial ED Vital Signs

Time:____:_____
BP: _____/_____
Pulse: _____/min
Resp.: _____/min
Temp.: ____ ^{0} C site_____
SaO2: _____%
Blood Glucose _____ mg/dl
Est. weight: _____ kg

A Awake and alert
V Verbal stimuli elicits response
P Painful stimuli elicits response
U Unresponsive to stimuli

Circulation

Skin:
☐Warm ☐Pink
☐Cool ☐Pale
☐Hot ☐Flushed
☐Dry ☐Ashen
☐Moist ☐Cyanotic
☐Diaphoretic

Pulse:
☐Central pulse present
☐Peripheral pulse present
☐No pulse

☐Strong
☐Thready
Capillary refill _____ sec.

IVs:

Time	Site	Size
____:____	_____	_____
____:____	_____	_____
____:____	_____	_____

☐Warm IV fluids

☐Warm blankets
☐Warming lights
☐Direct pressure bleeding control:
site_____

Disability

Glasgow Coma Scale (GCS)

Eye Opening
☐4 Spontaneous
☐3 To Verbal
☐2 To Pain
☐1 None

Verbal
☐5 Oriented
☐4 Confused
☐3 Inappropriate response
☐2 Incomprehensible
☐1 None/Intubated

Motor
☐6 Obeys
☐5 Localizes pain
☐4 Withdraws from pain
☐3 Flexor posturing
☐2 Extensor posturing
☐1 None/chemically paralyzed

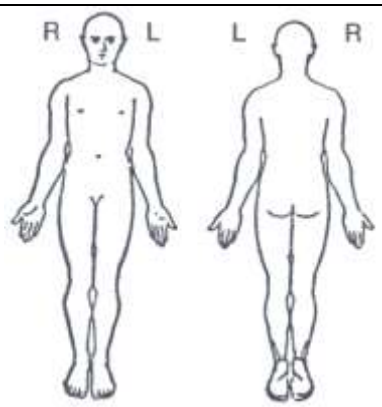
Pupils

L
☐Brisk
☐Sluggish
☐Non-reactive
_____mm

R
☐Brisk
☐Sluggish
☐Non-reactive
_____mm

MR#

Secondary Survey	
Head	☐Pain/tenderness Drainage from: ☐ears ☐nose ☐mouth
Neck	☐Pain/tenderness ☐JVD
Chest	☐Pain/tenderness ☐Dyspnea ☐ Deformity ☐ Paradoxical expansion
Abdomen	☐Pain ☐Tender ☐Rigid ☐Bowel sounds present ☐Soft ☐Guarded ☐Distended ☐Bowel sounds absent Emesis/gastrocult: ☐+ ☐-
Pelvis/Genital	☐Pain/tenderness Pelvis: ☐stable ☐unstable ☐Blood at the meatus Rectal tone: ☐present ☐absent Hemocult: ☐+ ☐-
Extremities	☐Pain/tenderness ☐CMS intact x4 ☐Moves all extremities ☐Extremities warm and pink
Back	☐Pain/tenderness ☐Deformity



Surface Trauma

Ongoing Monitoring											
Time	:	:	:	:	:	:	:	:	:	:	:
BP	/	/	/	/	/	/	/	/	/	/	/
Pulse											
Resp.											
SaO2	%	%	%	%	%	%	%	%	%	%	%
GCS											
Temp.	^{0}C	^{0}C	^{0}C	^{0}C	^{0}C	^{0}C	^{0}C	^{0}C	^{0}C	^{0}C	^{0}C
EKG											
$ETCO_2$											
Pain scale	/10	/10	/10	/10	/10	/10	/10	/10	/10	/10	/10

Medications

Drug/Procedure	Dose	Route	Time	Administered by	Response
			:		☐no change ☐improved
			:		☐no change ☐improved
			:		☐no change ☐improved
			:		☐no change ☐improved
			:		☐no change ☐improved
			:		☐no change ☐improved
			:		☐no change ☐improved
			:		☐no change ☐improved
			:		☐no change ☐improved
			:		☐no change ☐improved
			:		☐no change ☐improved
			:		☐no change ☐improved

Fluid In/Blood Products

Solution/Blood Product	Time hung	Size	Blood unit #	Time d/c'ed	Amount infused
	:	cc		:	cc
	:	cc		:	cc
	:	cc		:	cc
	:	cc		:	cc
	:	cc		:	cc
	:	cc		:	cc
	:	cc		:	cc
	:	cc		:	cc
	:	cc		:	cc
	:	cc		:	cc

MR#

Procedures			
Procedure	**Time**	**By**	**Detail**
☐Cast/splint	:		
☐Central line	:		
☐Chest tube R	:		
☐Chest tube L	:		
☐Cricothyrotomy	:		
☐Defib/Cardiovert	:		
☐Foley	:		
☐Intraosseous	:		
☐Needle thoracotomy	:		
☐OG/NGT	:		
☐RSI	:		
☐Suture	:		
☐	:		
☐	:		

Laboratory		Radiology			
Lab	**Time Ordered**	**X-ray**	**Time Ordered**	**CT**	**Time Ordered**
☐ BAC	:	☐CXR	:	☐Abdomen	:
☐CBC	:	☐Pelvis	:	☐Chest	:
☐Electrolytes	:	☐Skull	:	☐Head	:
☐Glucose	:	☐spine-Cervical	:	☐Neck	:
☐hCG	:	☐spine- Lumb/Sac	:	☐Pelvis	:
☐Hgb	:	☐spine- Thoracic	:	☐Spine	:
☐PT/INR	:	☐	:	☐	:
☐PTT	:	☐	:	☐	:
☐pH	:	☐	:	**Ultrasound**	**Time Ordered**
☐Tox. screen	:	☐	:	☐FAST exam	:
☐Type and screen	:	☐	:	☐	:
☐UA	:	☐	:	☐	:

Patient Disposition

☐**Admitted**		☐**Transferred**			
Pt left ED	:	Ordered	:	Transfer via:	Accompanying Pt:
Report called	:	Arrived	:	☐Helicopter	☐Copy of chart
Admitting service:		Pt left ED	:	_____	☐EMS report
Admitting physician:		Transferred to:		☐Ground	☐X-rays/CTs
☐**Expired in ED**	:	Referral hospital notified	:	_____	☐ Lab report
					☐RN_____

Patient Information

SSN	Address		Apt. #
Telephone Number	City	State/Province	Postal Code

Ethnicity	Race		Pay Source
☐Hispanic/Latino	☐White	☐American Indian/Alaskan Native	☐Medicare
☐Non-Hispanic/Latino	☐Black	☐Native Hawaiian/Pacific Islander	☐Uninsured
☐Unknown	☐Asian	☐Other	☐Other _____
	☐Unknown		☐Unknown

MR#

Notes

	Signatures	
[INSERT HOSPITAL NAME, ADDRESS, PHONE NUMBER]	Physician	
	Primary nurse	
	Recorder	

Attachment J: Suggested Criteria for Consideration of Transfer

Central Nervous System

- Penetrating injury/open fracture, with or without cerebrospinal fluid leak
- Depressed skull fracture
- GCS <14 or deterioration
- Spinal cord injury or major vertebral injury

Chest

- Major chest wall injury or pulmonary contusion
- Wide mediastinum or other signs suggesting great vessel injury
- Cardiac injury
- Patients who may require prolonged ventilation

Pelvis/Abdomen

- Unstable pelvic ring disruption
- Pelvic fracture with shock or other evidences of continuing hemorrhage
- Open pelvic injury
- Solid organ injury

Major Extremity Injuries

- Fracture/dislocation with loss of distal pulses
- Open long-bone fractures
- Extremity ischemia

Multiple-System Injury

- Head injury combined with face, chest, abdominal, or pelvic injury
- Burns with associated injuries
- Multiple long-bone fractures
- Injury to more than two body regions

Co-morbid Factors

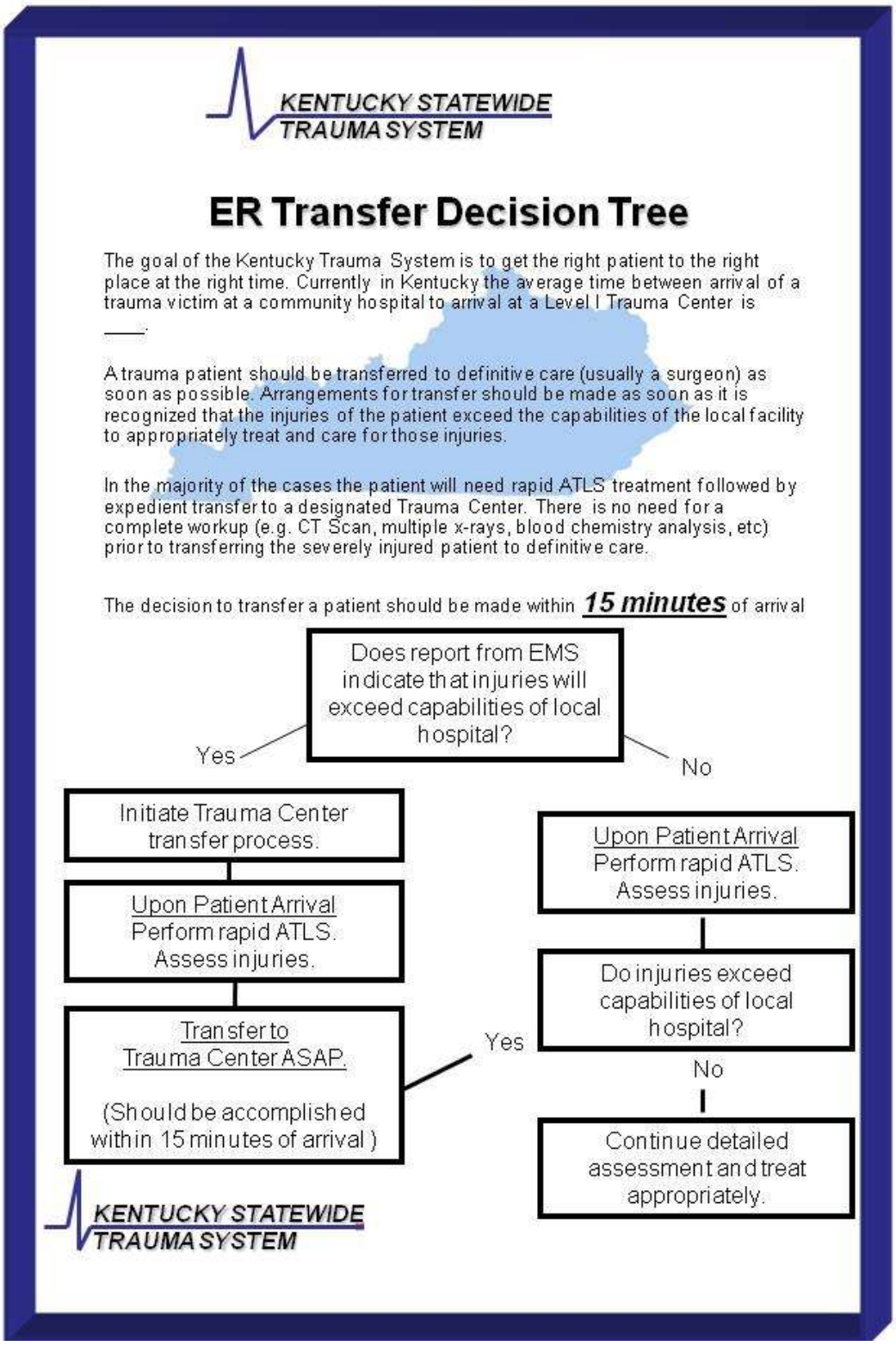
- Age >55 years
- Children ≤5 years of age
- Cardiac or respiratory disease
- Insulin-dependent diabetes, morbid obesity
- Pregnancy
- Immunosuppression

Secondary Deterioration (Late Sequelae)

- Mechanical ventilation required
- Sepsis
- Single or multiple organ system failure (deterioration in central nervous, cardiac, pulmonary, hepatic, renal, or coagulation systems)
- Major tissue necrosis

American College of Surgeons, *Resources for Optimal Care of the Injured Patient: 1999*, p. 21.

Attachment K: Quick ED Decision Trees



KENTUCKY STATEWIDE TRAUMA SYSTEM

ER Imaging Decision Tree

Victims of trauma have a high rate of repeat imaging after arrival at referral trauma centers. At least 25% of re-imaging can be avoided if optimal quality images are transferred with the patient (*Sung et al. JACR 2009*).

A critically injured trauma patient should be transferred to definitive care (usually a surgeon) as soon as possible and the decision to transfer a patient can often be made within ***15 minutes*** of arrival. In order to minimize delays in transfer, optimize outcome and minimize unnecessary reimaging of patients, the Kentucky Trauma System recommends the following priorities:

1. Perform only imaging necessary to guide emergency treatment.
2. If patients are transferred, send all imaging on CD (DICOM format) with the patient.
3. Provide name and contact number for the interpreting radiologist so that dialogue between the receiving trauma care providers and the radiologist may occur.

ATLS/RTTDC Resuscitation

Primary Survey, CXR, Pelvis X-ray

Do injuries exceed capabilities of local hospital?

Yes

Initiate Trauma Center transfer process.

Do Not Image Further Unless required for immediate treatment.

Transfer to Trauma Center ASAP.

1. Send images on CD.
2. Document name and contact # of interpreting radiologist

No

Continue ATLS assessment. Image as indicated.

Do injuries exceed capabilities of local hospital?

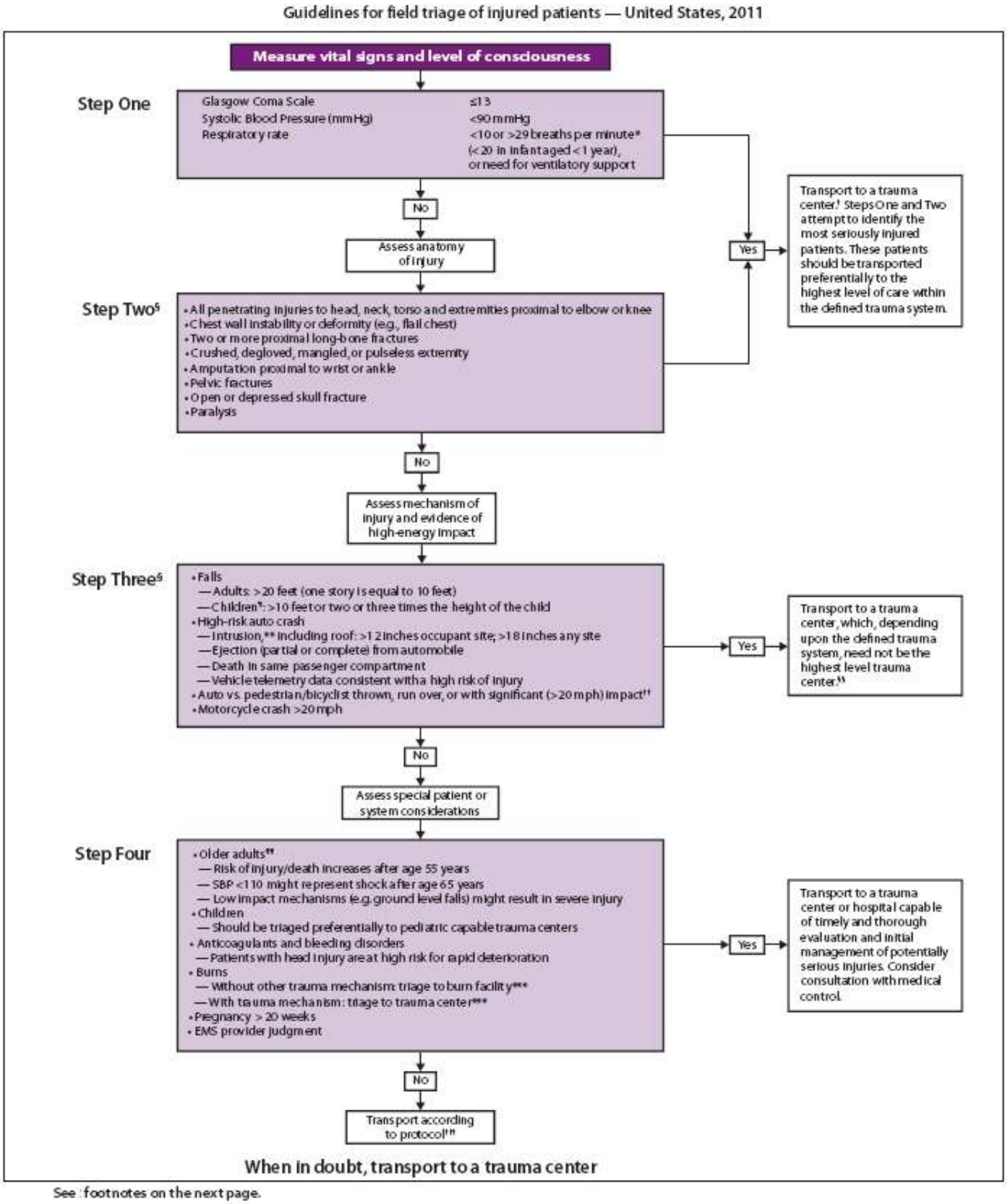
Yes

No

Continue detailed assessment and treat appropriately.

KENTUCKY STATEWIDE TRAUMA SYSTEM

Attachment L: CDC Field Triage Decision Scheme



See : footnotes on the next page.

Abbreviation: EMS = emergency medical services.

* The upper limit of respiratory rate in infants is >29 breaths per minute to maintain a higher level of overtriage for infants.

† Trauma centers are designated Level I-IV. A Level I center has the greatest amount of resources and personnel for care of the injured patient and provides regional leadership in education, research, and prevention programs. A Level II facility offers similar resources to a Level I facility, possibly differing only in continuous availability of certain subspecialties or sufficient prevention, education, and research activities for Level I designation; Level II facilities are not required to be resident or fellow education centers. A Level III center is capable of assessment, resuscitation, and emergency surgery, with severely injured patients being transferred to a Level I or II facility. A Level IV trauma center is capable of providing 24-hour physician coverage, resuscitation, and stabilization to injured patients before transfer to a facility that provides a higher level of trauma care.

§ Any injury noted in Step Two or mechanism identified in Step Three triggers a "yes" response.

¶ **Age <15 years.**

** Intrusion refers to interior compartment intrusion, as opposed to deformation which refers to exterior damage.

†† Includes pedestrians or bicyclists thrown or run over by a motor vehicle or those with estimated impact >20 mph with a motor vehicle.

§§ Local or regional protocols should be used to determine the most appropriate level of trauma center within the defined trauma care system; need not be the highest-level trauma center.

¶¶ **Age >55 years.**

*** Patients with both burns and concomitant trauma for whom the burn injury poses the greatest risk for morbidity and mortality should be transferred to a burn center. If the nonburn trauma presents a greater immediate risk, the patient may be stabilized in a trauma center and then transferred to a burn center.

††† Patients who do not meet any of the triage criteria in Steps One through Four should be transported to the most appropriate medical facility as outlined in local EMS protocols.

CDC source link: http://www.cdc.gov/mmwr/pdf/rr/rr6101.pdf

Adopted by KyTAC: January 17, 2012

Attachment M: Sample Trauma Transfer Protocol
Adult and Pediatric Transfer Protocol

Purpose:
Trauma patients who will be transferred out of this facility to a definitive care facility emergently must be identified early, assessed and treated quickly and transferred efficiently in order to provide them the best possible outcome.

Policy:
Patients to be transferred can often be identified before they arrive in the emergency department. Arrangements for emergent transfer can often begin the moment the emergency department staff is notified by EMS that they are en route with a major trauma patient. Other patients may require evaluation by the emergency department physician before the decision to transfer is made.

Once the decision to transfer has been made, it should not be delayed to obtain X rays, CT scans or laboratory results that do not immediately impact the resuscitation. At this point, the focus of the emergency department staff is on resuscitation and stabilization with the goal of minimizing the patient's length of stay in the emergency department.

Consideration should be given to whether the patient will be transferred via ground or air. Generally, seriously injured trauma patients should be transferred by air when possible. Consideration should be given to ground transport if the patient can be received by the definitive care facility sooner than if transported by air or if aero medical transfer is significantly delayed or unavailable for any reason.

Transport vehicles should be staffed by paramedics and/or nurses whenever possible. Trauma patients on whom invasive procedures have been performed or who have received medications must be transferred under the care of personnel who are adequately trained to manage their resulting condition. If necessary, a physician or nurse from this hospital may accompany the patient.

<u>The following are conditions that should immediately activate emergency transfer procedures:</u>

- Physiologic Criteria
    - * Respiratory distress or failure
    - * Children requiring endotracheal intubation and/or ventilatory support
    - * Shock, compensated or uncompensated
    - * Injuries requiring blood transfusion
- Central Nervous System
    - o Penetrating injury/open fracture with or without cerebrospinal fluid leak
    - o Depressed skull fracture
    - o GCS <11 or deteriorating mental status or lateralizing neurological signs
    - o Spinal cord injury or major vertebral injury
- Chest
    - o Major chest wall injury or pulmonary contusion
    - o Wide mediastinum or other signs suggesting great vessel injury
    - o Cardiac injury

- Pelvis/Abdomen
    - Pelvic fracture with shock or other evidence of continuing hemorrhage
    - Open pelvic injury
    - Unstable pelvic ring disruption
    - Major abdominal vascular injury
- Major Extremity Injuries
    - Fracture/dislocation with loss of distal pulses
    * Traumatic amputation with potential for reattachment
- Multiple-System Injury
    - Head injury combined with face, chest, abdominal, or pelvic injury
    - Burns with associated injuries
    * Other significant penetrating wounds to the neck, thorax, abdomen, or pelvis
    * Children requiring intensive care
- Secondary Deterioration (Late Sequelae)
    - Single or multiple organ system failure (deterioration in central nervous, cardiac, pulmonary, hepatic, renal, or coagulation systems)
    - Major tissue necrosis

<u>The following conditions should be considered for immediate transfer:</u>

- Central Nervous System
    - GCS >10 and <14
- Chest
    - Patients who may require prolonged ventilation
    - >2 unilateral rib fractures
- Abdomen
    - Solid organ injury
- Major Extremity Injuries or Fractures
    - Open long-bone fractures
    - Extremity ischemia
    - Multiple long-bone fractures
    * Children with fractures of the axial skeleton
- Multiple-System Injury
    - Injury to more than two body regions
- Co-morbid Factors
    - Age >55 years
    - Children <u>≤</u> 5 years of age
    - Cardiac or respiratory disease
    - Insulin-dependent diabetes
    - Morbid obesity
    - Pregnancy
    - Immunosuppression
- Secondary Deterioration (Late Sequelae)
    - Mechanical ventilation required
    - Sepsis

<u>Burn Criteria (Thermal or Chemical)</u>

- Electrical injury or burns (including lightning)
- Burns associated with trauma or complicating medical conditions
- Third degree burns of greater than 5% of the body surface area for any age group.

- Contact should be made with a Burn Center for children who meet any of the following criteria:
  - Second and third degree burns of greater than 10% of the body surface area for children less than ten years of age.
  - Second and third degree burns of greater than 20% of the body surface area for children over ten years of age.
  - Burns involving:
    - Signs or symptoms of inhalation injury.
    - Respiratory distress.
    - The face.
    - The ears (serious full-thickness burns or burns involving the ear canal or drums).
    - The mouth and throat.
    - Deep or excessive burns of the hands, feet, genitalia, major joints, or perineum.

Procedure:

Before patient arrival:

1. After becoming aware that a trauma patient is en route who likely will require emergent transfer, the emergency department staff activates the trauma team and notifies the emergency department physician of the likelihood of transfer. Ascertain from EMS if they have already ordered aero medical transportation.
2. The physician identifies the appropriate mode of transfer (i.e., aero medical vs. ground) and qualifications of transferring personnel.
3. Hospital contacts the appropriate aero medical and/or ground transportation, obtains ETA:
   - [INSERT CONTACT INFORMATION]
   - [INSERT CONTACT INFORMATION]
   - [INSERT CONTACT INFORMATION]

After patient arrival:

1. The physician identifies and contacts the receiving facility, and requests the receiving physician to accept the transfer. The two should discuss the current physiological status of the patient and the optimal timing of transfer.
2. Before transfer, the physician should:
   - Ensure chest tubes are placed in the presence of pneumothorax.
   - Ensure at least two IV lines are established.
   - Consider securing the airway with an endotracheal tube, LMA or surgical airway if GCS <11.
   - Consider sending additional blood, equipment and supplies (medications, fluids, etc.) that the patient may need en route if not available in the transporting vehicle.
3. The unit clerk copies all available documentation to accompany the patient:
   - EMS report
   - Resuscitation record
   - X rays, CT scans
   - Lab results

Attachment N: Transfer Agreement Example

Adult and Pediatric Transfer Agreement

This agreement is made and entered into by and between <<Name1 Hospital>> (hereinafter called <<Initials1H>>) and <<Higher Level Regional Medical Center>> (hereinafter called <<Initials RMC>>):

Whereas, both <<INITIALS1H>> and <<INITIALS RMC>> desire, by means of this Agreement, to assist physicians and the parties hereto in the treatment of trauma patients (e.g., burn, traumatic brain injuries, spinal cord injuries, multi-system injuries); and whereas the parties specifically wish to facilitate: (a) the timely transfer of patients and information necessary or useful in the care and treatment of trauma patients transferred, (b) the continuity of the care and treatment appropriate to the needs of adult and pediatric trauma patients, and (c) the utilization of knowledge and other resources of both facilities in a coordinated and cooperative manner to improve the health care of trauma patients.

IT IS, THEREFORE, AGREED by and between the parties as follows:

1. PATIENT TRANSFER: The need for transfer of a patient from <<INITIALS1H>> to <<INITIALS RMC>> shall be determined and recommended by the patient's attending physician in such physician's own medical judgment, based on the triage process for selecting an appropriate trauma center (see Triage document page). When a transfer is recommended as medically appropriate, a trauma patient at <<INITIALS1H>> shall be transferred and admitted to <<INITIALS RMC>> as promptly as possible under the circumstances, provided that beds and other appropriate resources are available. Acceptance of the patient by <<INITIALS RMC>> will be made pursuant to admission policies and procedures of <<INITIALS RMC>>.

2. <<INITIALS1H>> agrees that it shall:

    a. Notify <<INITIALS RMC>> as far in advance as possible of transfer of a trauma patient.

    b. Transfer to <<INITIALS RMC>> the personal effects, including money and valuables and information relating to same.

    c. Make every effort within its resources to stabilize the patient to avoid all immediate threats to life and limbs. If stabilization is not possible, <<INITIALS1H>> shall either establish that the transfer is the result of an informed written request of the patient or his or her surrogate or shall have obtained a written certification from a physician or other qualified medical person in consultation with a physician that the medical benefits expected from the transfer outweigh the increased risk of transfer.

    d. Affect the transfer to <<INITIALS RMC>> through qualified emergency medical personnel and appropriate transportation equipment to match the patient's acuity level, including the use of necessary and medically appropriate life support measures.

    e. Obtain informed consent for transfer from the patient, family member, or patient surrogate

3. <<INITIALS1H>> agrees to transmit with each patient at the time of transfer, or in the case of emergency, as promptly as possible thereafter, pertinent medical information and records necessary to continue the patient's treatment, a copy of the informed consent for transfer, and to provide identifying and other information.

4. <<INITIALS RMC>> agrees to state where the patient is to be delivered and agrees to
provide information about the type of resources it has available. Facility will provide directions and referral institution information to the family or patient surrogate.

5. Bills incurred with respect to services performed by either party to the Agreement shall be collected by the party rendering such services directly from the patient, third party, and neither party shall have any liability to the other for such charges.

6. This agreement shall be effective from the date of execution and shall continue in effect indefinitely. Either party may terminate this agreement on thirty (30) days notice in writing to the other party. If either party shall have its license to operate revoked by the state, this Agreement shall terminate on the date such revocation becomes effective.

7. Each party to the Agreement shall be responsible for its own acts and omissions and those of their employees and contractors and shall not be responsible for the acts and omission of the other institutions.

8. Nothing in this Agreement shall be construed as limiting the right of either to affiliate or contract with any hospital or nursing home on either a limited or general basis while this Agreement is in effect.

9. Neither party shall use the name of the other in any promotional or advertising material unless review and written approval of the intended use shall first be obtained from the party whose name is to be used.

10. This Agreement shall be governed by the laws of the State of Kentucky. Both parties agree to comply with the Emergency Medical Treatment and Active Labor Act of 1986, and the Health Insurance Portability and Accountability Act of 1996, and the rules now and hereafter promulgated.

11. This Agreement may be modified or amended from time to time by mutual Agreement of the parties, and any such modification or amendment shall be attached to and become part of the Agreement.

Date	Date
<<INITIALS RMC>> Representative	<<INITIALS1H>> President/CEO

Attachment O: Trauma PI Tracking Form

Demographics	Source of Information	Location of Issue
Date of report: Medical record #:	☐trauma program coordinator ☐nurse manager ☐staff nurse ☐physician ☐patient relations ☐rounds ☐multidisciplinary conference ☐registry ☐PI chart audit ☐	☐EMS ☐ED ☐OR ☐ICU/PACU ☐floor ☐radiology ☐lab ☐rehab ☐

Complication, problem or complaint:

Reviewed by:

Date of review:

Determination:	**Preventability:**
☐system-related ☐disease-related ☐provider-related ☐unable to determine	☐non-preventable ☐potentially preventable ☐preventable ☐unable to determine

Corrective action:

☐not necessary	☐guideline/protocol	☐resource enhancement
☐trend/track similar occurrences	☐counseling	☐privilege/credentialing review
☐education	☐peer review	☐

Explanation:

Signature:	**Date:**

Adapted from American College of Surgeons, Resources for Optimal Care of the Injured Patient: 1999, p. 72.

Attachment P: Definitions of Trauma Death Classifications

A **non-preventable** death results from an event or complication that is a sequela of a procedure, disease, illness, or injury for which reasonable and appropriate preventable steps have been taken.

For example, a gunshot wound to the head with a Glasgow Coma Scale (GCS) of 3 on arrival and subsequent death, posttraumatic pancreatitis, pneumonia, deep venous thrombosis (DVT), and so on, in patients who had appropriate preventative steps taken. Most deaths and morbidities fall into this category.

A **potentially preventable** death results from an event or complication that is a sequela of a procedure, disease, illness, or injury that has the potential to be prevented or substantially ameliorated.

For example, iatrogenic pneumothorax or wound dehiscence, wherein alternate techniques or judgments may have prevented the complication with some certainty. Such a choice is always a difficult call and requires determination from experienced trauma surgeons or a panel of physicians. An example of a potentially preventable mortality may be an elderly trauma patient with a severe head injury who develops a fatal arrhythmia from electrolyte abnormality. The arrhythmia may have been preventable, but it is unlikely that the death was; therefore, the death is deemed “potentially preventable.” A patient suffering a preventable morbidity who subsequently expires after being declared DNR (do not resuscitate) by family or advanced directive may be determined to be a potentially preventable mortality. There is no precision in these determinations; these are clinical judgments based on the best available evidence.

A **preventable death** results from an event or complication that is an expected or unexpected sequela of a procedure, disease, illness, or injury that could have been prevented or substantially ameliorated.

For example, a patient admitted with abdominal distention and shock who dies from a ruptured spleen two hours later while waiting for a surgeon. Death as a result of a missed epidural hematoma or esophageal intubation may be preventable. Preventable mortalities should be very unusual in a mature trauma care system. A missed fracture resulting from failure to examine the patient may be a preventable morbidity.

Reprinted from American College of Surgeons, *Trauma Performance Improvement Reference Manual*, January, 2002, pp. 6-7.

Attachment Q: Trauma PI Filter Tracking Worksheet

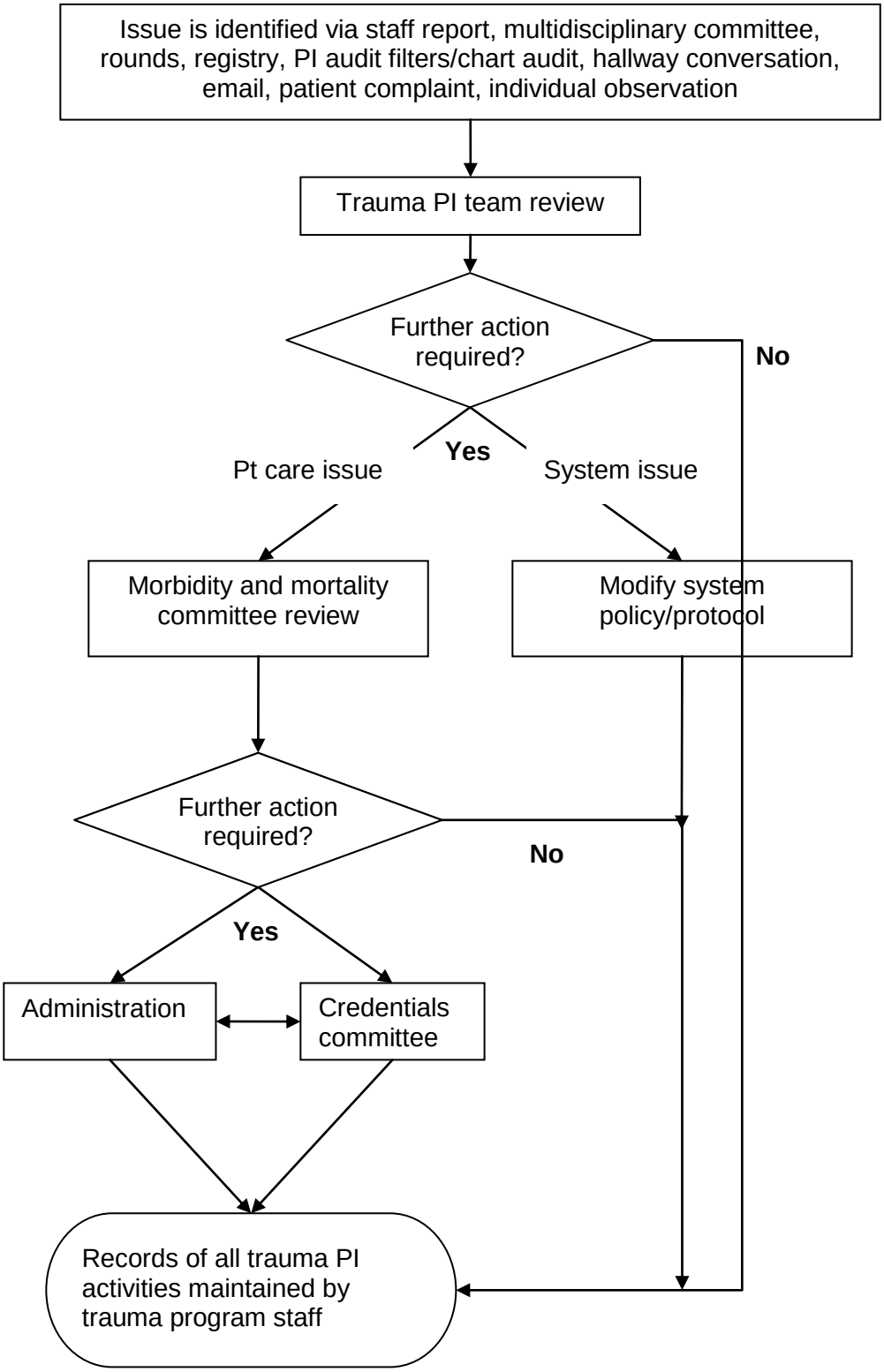
Patient name: _____ Admit date: _____

Medical record #: _____

Data Point	Yes	No	N/A
Trauma care provided by physicians who do not meet the educational requirement (e.g., ATLS)			
Transferred			
Pt died			
General surgeon arrival >30 minutes			
Admitted by non-surgeon			
Care provided by NP or PA			
Re-intubated within 24 hours of extubation			
Surgical debridement of open tibial fracture >8 hours (excluding low velocity gunshot wound)			
Open fracture to OR >8 hours after admission			
Massive blood transfusion (>3 units)			
Unscheduled return to the OR			
Over triaged/trauma team activated unnecessarily			
Under triaged/trauma team not activated when criteria met			
EMS scene time >20 minutes			
C spine injury missed on initial evaluation			
GCS <14 and head CT >2 hours after admission			
EMS report not in patient chart			
GCS ≤8 and no endotracheal tube or surgical airway			
Abdominal injuries, systolic blood pressure <90 and laparotomy >1 hour from arrival			
Abdominal, thoracic or vascular surgery after 24 hours			
Non-fixation of femoral diaphyseal fracture in adult			
Absent hourly charting			
Transfer out after 2 hours in the initial hospital			

Any chart that generated a "Yes" must be reviewed by trauma PI team.

Attachment R: Trauma PI Flowchart



Attachment S: Sample Level III Trauma Diversion Protocol

Purpose:
Occasions may arise when one or more essential hospital resources are functioning at maximum capacity or otherwise unavailable and it is in the best interests of the trauma patient to be directed to an alternative facility for care.

Policy:
The need to go on "trauma divert" is a rare situation but might occur in the following circumstances:

- The emergency department is saturated; demand for critical patient care resources exceeds availability.
- Emergency department resources are fully committed due to an external disaster/multiple-casualty event.
- Emergency department resources are unavailable due to an internal disaster or catastrophic mechanical failure.
- All available trauma surgeons are in the operating room.
- The operating room is functioning at maximum capacity; no surgical suites are expected to become available within one hour.
- General surgeons are overwhelmed with cases.
- The general surgeon is physically unable to operate.

In such rare cases the surgeon in collaboration with the emergency department physician may make the decision to divert trauma patients for a short period of time. The need to remain on divert status should be reviewed at least hourly to provide for the shortest possible time on divert.

The diversion of trauma patients only pertains to incoming ambulance patients and not to walk-in patients. A patient incoming via ambulance while on "trauma divert" will be accepted if the EMS provider and monitoring physician determine that the patient is experiencing a condition such that transport to the next closest appropriate trauma hospital could reasonably result in increased morbidity or death. "Trauma divert" status is a request to EMS personnel to transport the patient to another facility. The patient or EMS personnel may decline the request to divert provided they have been properly apprised of the potential for delayed treatment affecting the care of the patient.

Ambulance patients who have arrived on hospital property will be admitted to the emergency department and evaluated by a physician regardless of the hospital's diversion status.

Procedure:

<u>Going on divert:</u>

1. The surgeon on call and the emergency department physician will collaborate and decide on the need to go on "trauma divert." They will notify the emergency department charge nurse.

2. The charge nurse notifies the following of trauma divert status:
    a. Emergency department nursing staff
    b. ICU nursing staff

c. EMS dispatch center(s) (e.g. sheriff departments); request EMS personnel to call hospital early with patient information
d. [NEIGHBORING HOSPITAL(S)]

3. The emergency department charge nurse begins a “Trauma Divert Tracking Log.”

When contacted by EMS with information regarding a seriously injured trauma patient, the emergency department staff person taking report notifies the EMS crew that the hospital is on trauma divert and immediately puts the crew in contact with the emergency department physician. The physician will determine if the patient is to be seen in the emergency department or diverted to a nearby facility. The decision whether of not to divert must be accomplished very quickly in order to minimize the amount of time the patient spends in transit.

Going off divert:

1. The surgeon and emergency physician who initiated the closure must:
    a. Continuously evaluate the need to remain on trauma divert.
    b. Make the decision as to when the hospital is no longer on trauma divert.
    c. Notify the emergency department charge nurse when no longer on trauma divert.
2. The charge nurse notifies:
    a. Emergency department nursing staff
    b. ICU nursing staff
    c. EMS dispatch center
    d. [NEIGHBORING HOSPITAL(S)]
3. The emergency department charge nurse completes the “Trauma Divert Tracking Log” and forwards it to the trauma program manager.

Attachment T: Sample Level IV Trauma Diversion Protocol

Purpose:
Occasions may arise when one or more essential hospital resources are functioning at maximum capacity or otherwise unavailable and it is in the best interests of the trauma patient to be directed to an alternative facility for care.

Policy:
The need to go on "trauma divert" is a rare situation but might occur in the following circumstances:

- The emergency department is saturated; demand for critical patient care resources exceeds availability.
- Emergency department resources are fully committed due to an external disaster/multiple-casualty event.
- Emergency department resources are unavailable due to an internal disaster or catastrophic mechanical failure.

In such rare cases, the emergency department physician may make the decision to divert trauma patients for a short period of time. The need to remain on divert status should be reviewed at least hourly to provide for the shortest possible time on divert.

The diversion of trauma patients only pertains to incoming ambulance patients and not to walk-in patients. A patient incoming via ambulance while on "trauma divert" will be accepted if the EMS provider and monitoring physician determine that the patient is experiencing a condition such that transport to the next closest appropriate trauma hospital could reasonably result in increased morbidity or death. "Trauma divert" status is a request to EMS personnel to transport the patient to another facility. The patient or EMS personnel may decline the request to divert provided they have been properly apprised of the potential for delayed treatment affecting the care of the patient.

Ambulance patients who have arrived on hospital property will be admitted to the emergency department and evaluated by a physician regardless of the hospital's diversion status.

Procedure:

<u>Going on divert:</u>

1. The emergency department physician will decide on the need to go on "trauma divert." The physician will notify the emergency department charge nurse.
2. The XXX notifies the following of trauma divert status:
    a. Emergency department nursing staff
    a. EMS dispatch center(s) (e.g. sheriff departments); request EMS personnel to call hospital early with patient information
    b. [NEIGHBORING HOSPITAL(S)]
3. The emergency department charge nurse begins a "Trauma Divert Tracking Log."

When contacted by EMS with information regarding a seriously injured trauma patient, the emergency department staff person taking report notifies the EMS crew that the hospital is on trauma divert and immediately puts the crew in contact with the emergency department physician. The physician will determine if the patient is to be seen in the emergency department

or diverted to a nearby facility. The decision whether of not to divert must be accomplished very quickly in order to minimize the amount of time the patient spends in transit.

Going off divert:

1. The emergency physician who initiated the closure must:
    a. Continuously evaluate the need to remain on trauma divert.
    b. Make the decision as to when the hospital is no longer on trauma divert.
    c. Notify the emergency department charge nurse when no longer on trauma divert.
2. The charge nurse notifies:
    a. Emergency department nursing staff
    b. EMS dispatch center
    c. [NEIGHBORING HOSPITAL(S)]
3. The emergency department charge nurse completes the “Trauma Divert Tracking Log” and forwards it to the trauma program manager.

Attachment U: Trauma Divert Tracking Log

Complete one form each time the hospital goes on divert.

On divert
Date: _____

Time: _____
Determining physician(s):

Off divert
Date: _____

Time: _____
Determining physician(s):

Diverted patients

No patients diverted ☐

Date/Time: _____

Ambulance Service: _____

Chief Complaint: _____

Diversion destination: _____

Date/Time: _____

Ambulance Service: _____

Chief Complaint: _____

Diversion destination: _____

Date/Time: _____

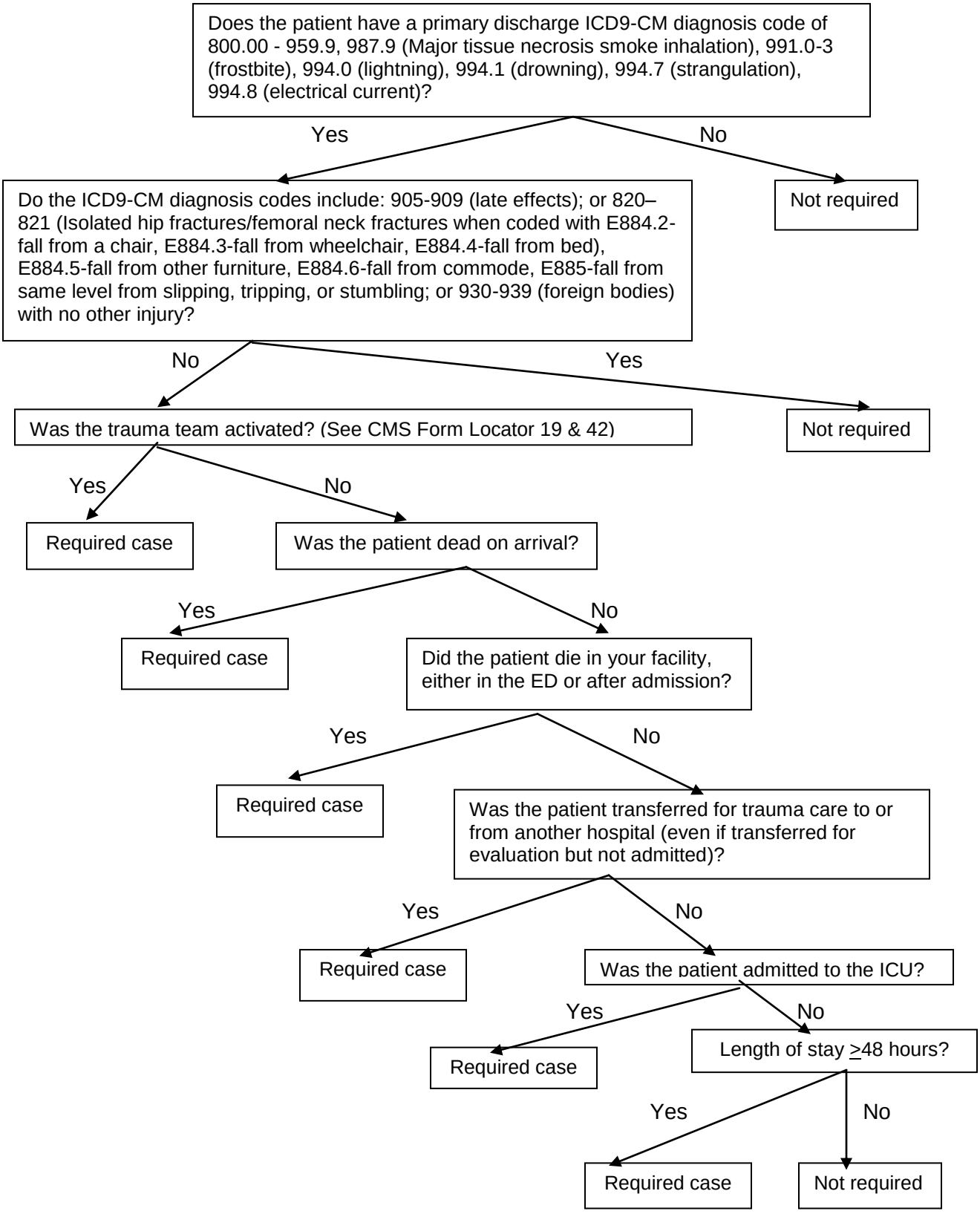
Ambulance Service: _____

Chief Complaint: _____

Diversion destination: _____

Forward this form to the trauma program manager.

Attachment V: Trauma Registry Inclusion Criteria



Attachment W: Level IV Equipment Checklist

Emergency Department Equipment	Infant	Child	Adult
Airway control and ventilation equipment	☐	☐	☐
Pulse oximetry	☐	☐	☐
Suction devices	☐	☐	☐
Electrocardiograph/oscilloscope/defibrillator	☐	☐	☐
Standard IV fluids and administration sets	☐	☐	☐
Mechanism for iv flow-rate control	☐	☐	☐
Large bore IV catheters	☐	☐	☐
Intraosseous Infusion sets	☐	☐	☐
Supplies for cricothyrotomy	☐	☐	☐
Supplies for thoracostomy	☐	☐	☐
Drugs necessary for emergency care	☐	☐	☐
Nasogastric/oral gastric tubes	☐	☐	☐
Spinal immobilization boards and c-collars	☐	☐	☐
Pediatric length-based resuscitation tape	☐	☐	
Thermal control for patients and fluids/blood	☐	☐	☐
Rapid infuser system (e.g., pressure bag)	☐	☐	☐
End-tidal CO_2 detector	☐	☐	☐
Communication with EMS	☐	☐	☐

Clinical Laboratory Services

Equipment	Infant	Child	Adult
Standard analysis of blood, urine and other body fluids including micro sampling, when appropriate	☐	☐	☐
Comprehensive blood bank or access to community blood bank	☐	☐	☐

Operating Room (if OR services available)

Equipment	Infant	Child	Adult
Thermal control for patients and fluids/blood	☐	☐	☐

Attachment X:
Recommended Pediatric Equipment Checklist

Guidelines for Equipment and Supplies for Use in Pediatric Patients in the ED[*]

Monitoring equipment

- Cardiorespiratory monitor with strip recorder
- Defibrillator with pediatric and adult paddles (4.5 cm and 8 cm) or corresponding adhesive pads
- Pediatric and adult monitor electrodes
- Pulse oximeter with sensors and probe sizes for children
- Thermometer or rectal probe[†]
- Sphygmomanometer
- Doppler blood pressure device
- Blood pressure cuffs (neonatal, infant, child, and adult arm and thigh cuffs)
- Method to monitor endotracheal tube and placement[‡]
- Stethoscope

Airway management

- Portable oxygen regulators and canisters
- Clear oxygen masks (standard and non-rebreathing—neonatal, infant, child, and adult)
- Oropharyngeal airways (sizes 0-5)
- Nasopharyngeal airways (12F through 30F)
- Bag-valve-mask resuscitator, self-inflating (450- and 1000-mL sizes)
- Nasal cannula (child and adult)
- Endotracheal tubes: uncuffed (2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, and 6.0 mm) and cuffed (6.5, 7.0, 7.5, 8.0, and 9.0 mm)
- Stylets (infant, pediatric, and adult)
- Laryngoscope handle (pediatric and adult)
- Laryngoscope blades: straight or Miller (0, 1, 2, and 3) and Macintosh (2 and 3)
- Magill forceps (pediatric and adult)
- Nasogastric/feeding tubes (5F through 18F)
- Suction catheters—flexible (6F, 8F, 10F, 12F, 14F, and 16F)
- Yankauer suction tip
- Bulb syringe
- Chest tubes (8F through 40F)[§]
- Laryngeal mask airway[‖] (sizes 1, 1.5, 2, 2.5, 3, 4, and 5)

Vascular access

- Butterfly needles (19-25 gauge)
- Catheter-over-needle devices (14-24 gauge)

- Rate limiting infusion device and tubing[§¶]
- Intraosseous needles (may be satisfied by standard bone needle aspiration needles)
- Arm boards[‖]
- Intravenous fluid and blood warmers[§]
- Umbilical vein catheters[§#] (size 5F feeding tube may be used)
- Seldinger technique vascular access kit[§]

Miscellaneous

- Infant and standard scales
- Infant formula and oral rehydrating solutions[§]
- Heating source (may be met by infrared lamps or overhead warmer)[§]
- Towel rolls, blanket rolls, or equivalent
- Pediatric restraining devices
- Resuscitation board
- Sterile linen[**]
- Length-based resuscitation tape or pre-calculated drug or equipment list based on weight

Specialized pediatric trays

- Tube thoracotomy with water seal drainage capability[§]
- Lumbar puncture
- Pediatric urinary catheters
- Obstetric pack
- Newborn kit[§]
- Umbilical vessel cannulation supplies[§]
- Venous cutdown[§]
- Needle cricothyrotomy tray
- Surgical airway kit (may include a tracheostomy tray or a surgical cricothyrotomy tray)[§]

Fracture management

- Cervical immobilization equipment[§††]
- Extremity splints[§]
- Femur splints[§]

Medical photography capability

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[*] Adapted from Committee on Pediatric Equipment and Supplies for Emergency Departments, National Emergency Medical Services for Children Resource Alliance.[9]

[‖] Suitable for hypothermic and hyperthermic measurements with temperature capability from 25°C to 44°C.

[+] May be satisfied by a disposable CO_2 detector of appropriate size for infants and children. For children 5 years or older who are $\geq$20 kg in body weight, an esophageal detection bulb or syringe may be used additionally.

[§] Equipment that is essential but may be shared with the nursery, pediatric ward, or other inpatient service and is readily available to the ED.

‖Equipment or supplies that are desirable but not essential.

¶ To regulate rate and volume.

Ensure availability of pediatric sizes within the hospital.

** Available within hospital for burn care.

ǀMany types of cervical immobilization devices are available, including wedges and collars. The type of device chosen depends on local preferences and policies and procedures. Chosen device should be stocked in sizes to fit infants, children, adolescents, and adults. Use of sandbags to meet this requirement is discouraged, because they may cause injury if the patient has to be turned.

American Academy of Pediatrics, *Care of Children in the Emergency Department: Guideline for Preparedness*: http://aappolicy.aappublications.org/cgi/content/full/pediatrics%3B107/4/777

Checklist: http://www.aap.org/visit/Checklist_ED_Prep-022210.pdf

Attachment Y:
KyTAC Recommended
Emergency Department Pediatric Medication List
(Revised: 8-31-2010)

Resuscitation Medications	Quantity
Activated Charcoal (liquid, suspension, tablet, or powder for suspension)	2
Adenosine 3 mg/ml 2 ml vial	3
Amiodarone 150mg/3ml vial	2
Atropine 1mg/ml 1 ml vial	1
Atropine Syringe 1 mg/10ml	3
Calcium Chloride 10% 1 gm/10ml vial	4
Calcium Chloride Syringe 10% 10 ml	2
Dextrose Syringe 25% 10 ml	2
Dextrose Syringe 50% 50 ml	1
Dopamine 80 mg/ml 5 ml vial	4
Epinephrine Injection 1:1000 30 ml vial	1
Epinephrine Syringe 1:10,000 10 ml	6
Glucagon (1 mg vials)	2
Magnesium Sulfate 0.5 gm/ml 2 ml vial	2
Milrinone Injection 1mg/ml 10 ml vial	**1**
Naloxone 0.4 mg/ml 1 ml vial	2
Sodium Bicarbonate 4.2% 5mEq syringe	**1**
Sodium Bicarbonate 8.4% 50mEq syringe	2
Vasopressin 20 unit/ml 1 ml vial	4

Antibiotic Medications	Quantity
Ampicillin 1 gm vial	1
Ceftriaxone (Rocephin) 2 gm vial	1
Cefotaxime 1 gm vial	1
Gentamicin 20mg/2 ml vial	2
Vancomycin 1 gm vial	1

Anticonvulsant/Sedative Medications	Quantity
Diazepam 10 mg/2ml	1
Lorazepam 2 mg/1ml vial	6
Phenobarbital 130 mg/1 ml vial	4
Fosphenytoin 500 mg/10 ml vial	1

Analgesic Medications	Quantity
Fentanyl 100 mcg/2ml	2
Morphine 4 mg tubex	4

Antiemetic Medications	Quantity
Ondansetron (Zofran) 4mg/2ml vial	1
Promethazine 25 mg/ml	1

Neuromuscular Blocker Medications	Quantity
Succinylcholine 150 mg vial	2

Diuretic Medications	Quantity
Mannitol 20% 500 ml bag	1

Steroid Medications	Quantity
Dexamethasone 4mg/ml vial	1
Methylprednisolone 500 mg vial	1

Bronchodilators Medications	Quantity
Albuterol Inhalation Solution	10
Racepinephrine Inhalation Solution	3

Attachment Z: Kentucky State Trauma Care System
Criteria for State Verification: Level IV Trauma Center

Program Component	*Description(s)*	*Specific Criteria*
Trauma Program	The board of directors, administration, medical, nursing, and ancillary staff must make a commitment to provide trauma care at the level for which the facility is seeking verification. A trauma program must be created with agreement from the board of directors, administration, and medical staff.	
Trauma Program Medical Director	The trauma services medical director should be a BC/BE physician on staff at the facility, preferably an EM physician. The job description must include his/her roles and responsibilities for trauma care, such as trauma team formation, supervision/leadership, and continuing education. The medical director must act as the medical staff liaison to administration, nursing staff, etc. and as the primary contact for that facility with other trauma centers in the region. Required to maintain certification as an ATLS© provider if not BC/BE by ABEM or AOBEM. RTTDC participation required.	ATLS Current PALS Current ACLS Current RTTDC Required
Trauma Program Manager/ Coordinator	The trauma program manager is required and this person should be an RN with trauma care experience (ICU, ED, or flight experience). Other heath care personnel with trauma care experience (EMT-P, etc) may fill this role if needed. The program manager will work with the trauma services medical director to coordinate and implement the facility's trauma care response. The job description should include time dedicated to the trauma program, separate from other duties the program manager may have at the facility.	Trauma Coordinator Required
Emergency Department Coverage	There should be 24-hour physician coverage of the emergency department. A mid-level provider (NP, PA) may serve as the trauma team leader, but a designated ED physician should be present for immediate consultation during trauma team activations. There must be a designated physician medical director of the ED.	ED Medical Director Required
Emergency Department Physicians	Preferred BC/BE, but not required. ED physicians must maintain current ATLS© Provider certification if not BC/BE by ABEM or AOBEM, and should participate in a RTTDC©, preferably at their practice facility.	ATLS Current PALS Current ACLS Current RTTDC Preferred
Surgical Staff	Orthopedic surgery, plastic surgery, and radiology staff desirable. If staff available, published call schedules are essential. If surgical services will be provided, anesthesia coverage will be essential. 15 hours of annual trauma-related CME for surgeons is required every 3 years. Participating surgical specialties must have one representative attend at least 50% of multi-disciplinary trauma conferences.	

Trauma Nursing Education	Nurses responsible for trauma care at the facility must have completed one of the professional education courses specific to trauma care (Trauma Nursing Core Course TNCC, Advanced Trauma Care for Nurses ATCN, etc). TNCC is the preferred course.	TNCC Required
Transfer Protocol	The facility must have a written protocol describing the method to rapidly and effectively transfer the trauma patient requiring a higher level of care. The protocol must address: Available ground/air transport services (with contact information), alternative transport services, receiving trauma centers/trauma surgeons contact information, what supplies/records/resources may be utilized to effect the transfer, and specific anatomic and physiologic criteria that if met, will immediately initiate transfer to definitive care. This should ideally be written with involvement of the local ground EMS provider(s) and regional air medical provider(s) to assure seamless patient care during transfer.	
Transfer Agreement	The facility must have a written agreement with a verified Level I, II and/or III trauma center, or appropriate non-verified center, regarding transfer/care of adult and pediatric trauma patients that exceeds the capabilities of the Level IV facility. Back-up transfer agreement must be obtained specifically for burn patients, in the event the primary regional receiving facility does not have the required capacity. Well defined transfer plans are essential.	Transfer Agreements Required: 1. Level I, II and/or III 2. Burn Care 3. Pediatric Care
Radiology	The facility should have a Radiologic Technologist in-house 24-hours a day for basic plain films used in the evaluation of trauma patients. In the event a technician is not in-house, a 20-minute response time from trauma team activation is required. Response times must be documented and monitored by the trauma program manager. CT and sonography capabilities desirable.	1. Rad Tech <20min for activations 2. CT desired 3. Sonography desired
Clinical Laboratory	The facility must have a Lab Technician available 24-hours a day capable of performing basic studies used in the initial evaluation of trauma patients: CBC, typing, coagulation profile, and ABG. In the event a technician is not in-house, a 20-minute response time from trauma team activation is required. Response times must be documented and monitored by the trauma program manager. Cross-matching is desired but not required. The lab (or blood bank) must have at least two units of O-negative blood available for trauma patients, to be infused at the facility or while en-route to definitive care. There should be a mechanism in place to rapidly access blood/blood products during emergency situations when the lab is not staffed. Micro-sampling is required.	<u>Required:</u> 1. Lab Tech <20min for activations 2. Standard chemistry 3. ABG 4. Hematology 5. Coags 6. Blood typing 7. Blood storage 8. Two units O- PRBC 9. Access to blood from community center <u>Desired</u> 1. Cross-matching
Respiratory Therapy	The facility must have a Respiratory Care Practitioner available 24-hours a day to respond to the ED in the event of a trauma team activation. In the event a Practitioner is not in-house, a 20-minute response time from trauma team activation is required. Other health care personnel (RN, EMT-P) can fulfill this role in the interim provided they have documented internal training and continuing education regarding the use of mechanical ventilation.	Response within 20min of activation required Available 24rs/day desired
Rehab Services	Physical therapy, occupational therapy and social services are desirable but not required.	PT, OT, SW desired.

Trauma Team Activation	The facility must have a trauma team activation protocol that addresses the following: • Members of the team and their response requirements once the team has been activated. • Criteria (based on severity, anatomy, and/or physiology of the injury) for trauma team activation and the person(s) authorized to activate the trauma team. • Physician must be present at all trauma team activations.	Presence of the ED physician at trauma activations is required.
Intensive Care Unit	If an ICU is present and trauma patients will be admitted to the ICU, involvement of a surgeon as Director or Co-Director of the ICU is desired.	Surgeon Director/ Co-Director Desired
Performance Improvement	It is required that all trauma centers have an in-house Trauma Registry and contribute to the State Trauma Registry. The facility must have a written policy outlining the performance improvement portion of the trauma program. This must include: • Person(s) responsible for performing PI reviews • Minimum cases to be reviewed: Patients requiring transfer, all trauma deaths, non-compliance of trauma team members to response time requirements, bypasses, transfers, trauma care provided by physicians not meeting minimal education requirements • Frequency of meetings • Multidisciplinary physician involvement (Program Director, Radiology, Surgeon if involved) • Attendance minimums for members (50%) • Evidence of loop closure and resolution The ultimate responsibility for concurrent or retrospective review of trauma patient care lies with the trauma services medical director and program manager. Feedback should be obtained for all transferred patient to Level I, II or III centers.	Required 1. PI Program 2. In-house Registry 3. Contribution to state registry 4. Audit of all trauma deaths 5. Morbidity review 6. Multi-disciplinary trauma conference 7. Minimum conference attendance (Emergency Medicine 50%; General Surgery 50%-if involved) 8. Audits of nursing care 9. Audit of pre-hospital trauma care 10. Review of times 11. Review of bypasses 12. Review of transfers 13. Patient care
Morbidity and Mortality Review	A mechanism must be established by which all physicians participating in trauma patient care are involved in a confidential peer review in accordance with medical staff policy. Meetings must regularly review and discuss: Results of peer review activities, problematic cases including complications, and all trauma deaths- classified as preventable, potentially preventable, or non-preventable.	
Trauma Registry	Collect data via NTDB (National Trauma Databank)-registry and submit to statewide trauma care system database within 90 days of patient discharge.	Trauma Registry Contribution to State Registry
Rural Trauma Team Development Course©	The facility should host or participate in a joint RTTDC©, as outlined by the American College of Surgeons Committee on Trauma. Participation of physicians, members of administration, nursing, ancillary support staff, and local pre-hospital providers is strongly encouraged.	RTTDC Participation

Outreach Education	Conduct of ATLS, TNCC (or equivalent) and ITLS/PHTLS courses is desirable. Conduct of trauma-related CME for physicians, nurses, pre-hospital and other personnel is desirable.	
Injury Prevention	The facility should participate in injury prevention programs. These may be organized by the facility or in cooperation with law enforcement, fire, EMS, etc. Documentation of activities should be available for review during the verification/re-verification process. Collaboration with other institutions is desired. Monitoring of progress and efficacy of the prevention program(s) is desired.	
Emergency Department Equipment	Refer to Kentucky Trauma Resource Manual.	
Operating Room	It is desirable that an operating room be available for emergency procedures within the scope of practice of the physicians on medical staff. If an operating room is available and the trauma center elects to us that facility for the surgical care of victims of trauma at ANY time, the following are required: 1. Operating room staff available within 30 minutes of notification 2. Anesthesia staff within 30 minutes of notification 3. Age specific equipment including: thermal control equipment for patients and fluids/blood products. Also DESIRABLE are endoscopes, bronchoscopes, equipment for long-bone fixation and rapid infusion equipment. 4. If orthopedic procedures are to be performed, C-arm capability is required. 5. Post-anesthetic recovery MUST contain: equipment for monitoring and resuscitation, pulse oximetry, thermal control	
Resuscitation Equipment for All Ages	Required resuscitation equipment includes: airway and ventilation, pulse oximetry, suction, ECG, defibrillator, IV administration sets, large bore vascular catheters, cricothyroidotomy, thoracostomy, emergency drugs, Broselow tape, fluid warmer, qualitative CO2 detector, EMS communication equipment Desirable resuscitation equipment includes: venous cutdown, peritoneal lavage, rapid infuser	

Attachment AA:
Kentucky Trauma Care Program Statutes
KRS 211.490 - 496

The *Statewide Trauma Care Program* statutes

- KRS 211.490 Legislative findings concerning provision of trauma care.
- KRS 211.492 Definitions for KRS 211.490 to 211.496.
- KRS 211.494 Statewide trauma care program -- Goals -- Advisory committee-Components of trauma care system -- Coordination of activities -- Confidentiality of data -- Reports -- Administrative regulations.
- KRS 211.496 Kentucky trauma care system fund -- Uses.

(Can be viewed and downloaded from: http://www.lrc.ky.gov/KRS/211-00/CHAPTER.HTM)

(Cross-Reference for KRS 211.492 (Definition of Trauma)

- KRS 311A.010 Definitions for chapter.

(Can be viewed or downloaded from: http://www.lrc.ky.gov/KRS/311A00/CHAPTER.HTM)