

**TRAUMA CENTER H**  
**Best Preparedness Practice**  
**Component: Operational Sustainability**

**1. Brief Description of Preparedness Practice:**

Trauma Center H is well prepared to manage sudden patient surges and the resulting impact these surges have on the Emergency Department and inpatient capacity. Multiple management systems related to surge capacity have been integrated into the hospital's daily normal operations. The efficiency of this daily practice places the hospital's processes at a significant advantage in the event there is a sudden and/or a sustained influx of patients.

**2. Need or Motive that Drove Practice Development:**

Certificate of Need Process in Relation to Population Growth

The State healthcare system functions under the Division of Facility Services (DFS) Certificate of Need (CON) process. The County has a rapidly expanding population of more than 700,000. An average of 65 persons per day is moving into the county. This rapid population growth is putting a strain on the education system as well as the health care systems. Trauma Center H recently received approval through the CON process to add 102 beds to its system, as the data clearly defined the need for additional hospital beds. Since the hospital has not been able to expand its capacity in relation to the population growth and demand until recently, the organization had to design a system to maximize its ability to manage capacity.

Development of Children's Services

In 1996, the need to develop a Children's Emergency Department (CED) was identified. This service was successfully established on the same campus as the Trauma Center, with the CED now seeing approximately 40,000 children per year. The CED and Trauma Center also include a Pediatric Intensive Care Unit. These two services are well known throughout the state and they receive a significant number of referrals. It is recognized these services must be prepared to manage an event resulting in a surge of injured and/or ill children.

Development of Stand Alone Emergency Departments

In 2005, Trauma Center H opened the State's first stand alone emergency department. There is a plan in place to open a second stand-alone emergency department in 2007 and potentially a third one shortly thereafter. It was estimated that the daily census of the first site would see an average of 14 patients per day. Almost immediately, it was recognized that the daily volume was going to be much greater. That department generally treats more than 70 patients per day and has surged to greater than 85 patients per 24 hours at least once a month. It has been found that the stand alone Emergency Department "feeds" the main Trauma Center campus. For example, in this first year, there have been approximately 2,000 interfacility critical care or basic life support transports from this center.

Level of Emergency Department Patient Acuity

The percent of Adult Emergency Department admissions to inpatient units has increased to a level of approximately 17%. This increase in acuity has brought challenges to both the ED and to inpatient units as they try to accommodate this increased admission rate.

Increased Outpatient Invasive Procedures Census

The popularity of performing outpatient procedures has increased due to managed care. The areas where these patients recover from procedures are not adequate and do not meet the increase in demand.

### Impact Summary

The result of these factors is that the bed occupancy rate is generally more than 90% at 8 am and generally reaches 100% by 12 noon.

### **3. Leadership involved in Developing Preparedness Practice:**

Since the year 2000, Trauma Center H has established many initiatives related to improving multiple processes related to surge capacity. Members of the senior executive staff have consistently led these initiatives, including many led by the Chief Operating Officer. One of our current COO's primary initiatives is redesigning the health system's surge capacity plans.

### **4. Resources Involved or Applied to Practice Development:**

#### Performance Improvement Initiatives

Over the past five years, there have been multiple task forces dedicated to performance improvement initiatives related to surge planning. One example is the Emergency Services Performance Improvement initiative (ESPI). This initiative demonstrated the impact that Emergency Department surge problems have on the entire health system, from admitting to our inpatient units. As a result, system-wide practices were changed. It is now recognized that these systems and practice changes indirectly positioned the hospital system to better handle a sudden increase in capacity.

#### Information Systems

Trauma Center H has invested in several electronic systems that have become a critical part of surge management. They include:

- *Healthmathics ED (HMED)*, which provides electronic patient tracking in each of the Trauma Center H's system's four Emergency Departments.
- *ClinTrac*, which electronically provides case management related information.
- *Bed Tracking and PreAdmit Tracking*, which tracks the status of all the hospital beds in real time. This system provides the visual of an electronic bed board tracking system. In the past year, practices were changed to coordinate admissions between the two hospitals in the Trauma Center H system, using this system.
- The hospital is actively in the process of installing a system known as *E-Notify*. This system will allow for rapid activation of key departments, such as the Emergency Department, Radiology and Laboratory, key groups of staff, such as trauma surgeons and identified Trauma Center H emergency response teams. When activated, the system will notify these individuals on all their communication devices (e-mail, voice-mail, home telephones, cellular phones, pagers, etc) until there is a response. The person who is responding can notify the system of their status and estimated time of arrival to their assignment. The system will also allow for the preassignment of individuals into the Trauma Center's incident command structure. The person coordinating the event can very quickly assess the level of staff that is responding. This notification system is considered a critical component for the management of any surge event.

In a disaster situation when the Hospital Emergency Operations Center (HEOC) needs to be established, E-Notify will be utilized to rapidly activate the teams. HMED and the Bed Tracking system will be linked in the HEOC. HMED provides the HEOC with the acuity level, number of victims and patient information, and the Bed Tracking system provides information as to the location and placement status for each patient. As these systems are used on a daily basis, the staff can quickly gather the critical disaster-related patient information.

### Human Resources

- Graduate students from the State University were contacted and participated in the statistical data analysis related to a number of the system flow projects.
- HR implemented a policy that allocates additional staffing hours and bonus shifts during periods of sustained surge. This policy has proven very effective in our ability to manage daily operations during times of high patient census.
- Departments and staff that traditionally have not had a role in disaster response have been brought into planning processes. For example, the Rehabilitation Hospital members are part of the current Surge Task Force, as it is recognized they may have staff, space and other resources that could be used in a surge event. A number of employees in business and support departments have joined the Special Operations Decontamination Team. The Grounds staff is going to be approached to join the Special Operations Logistics Team as they have a great source of vehicles that could be used to support Special Operations.
- All Task Forces and Quality Improvement Teams related to surge have been multi-disciplinary.

### Training

- Education and training was provided in all departments that have been affected by a change in practice and /or policy.
- In 2006, approximately 140 individuals have been trained in Special Operations and/or State Medical Team operations related to disaster response.
- Multiple hospital incident command courses were offered to management staff.
- In 2006, key managers were required to complete the National Incident Command System courses 100, 200 and 700 (NIMS).
- In the past two years, there have been multiple drills/events related to surge/ mass casualty incidents. These include chemical drills, emerging disease drills, and the experience of the more traditional events, such as a recent passenger train accident event.

### Supplies and Equipment

- Necessary portable equipment, forms, pharmaceuticals and medical/surgical supplies have been identified for Emergency Department Alternate Treatment sites.
- Additional cardiac monitors have been purchased for a number of Emergency Department bays.
- The monitors in the Emergency Department Observation units have been upgraded to make them capable of monitoring parameters generally associated with an intensive care unit. This provides the capability to expand the number of intensive care beds for those patients with the highest acuity levels.

### Community Relationships

- Trauma Center H trains with multiple community partners, including the other two hospital systems in the county. The coordination of resources is critical in surge events. This coordination was evident in the National Disaster Medical System (NDMS) delivery of Hurricane Katrina and Hurricane Rita evacuees to another City. Trauma Center H served as the command hospital, coordinating the communications with the county and the hospitals located within a 60-mile radius.
- Trauma Center H is the lead hospital for the Trauma System's Capital Regional Advisory Committee. This committee is currently working on a regional disaster plan that includes several county's hospitals and EMS systems.
- Trauma Center H is working with the other hospitals in the county to develop Alternate Care Facilities. The four hospitals will work together to manage the operations of these facilities in a surge event. This will be in coordination with other community partners, such as Emergency Management and Public Health.

- Trauma Center H is an active participant in community disaster planning. For example, Trauma Center H recently participated in a workshop that was focused on the development of isolation and quarantine plans.

#### Facility Options/Space

- Alternate Treatment sites have been identified on the campus. A number of these areas are departments that may be underutilized and/or may not have any utilization during non-business hours. Other areas have been identified, where services could be stopped and the space converted to an extension of the Emergency Department. One example is the Andrews Center, which normally provides a variety of educational courses. In an emergency event, this space would be converted to a treatment area for the walking wounded and/or healthy, but concerned populations.
- A system that can easily convert an Emergency Department Holding Area to negative pressure was installed at Hospital X, Trauma Center H's community hospital. Additional areas that could be converted to negative pressure are being evaluated. This information is critical in an emerging disease surge of patients that would require these types of precautions.
- Within the past year, two observation units were created. Additionally, a Certificate of Need has just been submitted for another 36-bed holding unit. This space becomes invaluable in the event of a natural or disaster surge. It is anticipated that this unit will be available in the winter of 2007.
- Construction and Design evaluate the design of new space and/or renovations in relation to the potential use of the space for disaster events.

#### Communications

- A bed availability message is sent to key individuals at 6 am everyday. This test message provides details of the current census and what is expected to manage daily operations and any surge during the course of the day.
- The Hospital's Emergency Operations Center has been equipped to provide the resources necessary to manage the communications for a surge event. For example, \$60,000 was allocated to purchase banks of telephones for use by the incident command teams as well as to manage the surge of telephone calls that can be anticipated with a real surge of patients.
- Efforts are being made to get all the hospitals in the county onto the 800 MHz radio system, the same radio system as the emergency responders.

#### Resource Information

- Important information has been gathered into a resource book for the use in the Hospital Emergency Operations Center. For example, the list of the negative pressure rooms and isolation rooms in the health care system are included in the resource book.

#### Financial Support

- Financial Services has been an integral part of the process, and has provided the financial assessments needed to support the proposed projects and/or change in practices.

#### Formation of the Trauma Center H Emergency Services Institute

- In 2004, it was recognized that there needed to be a focus on the development of the emergency management disaster program for the hospital system. The CEO/President formed the Trauma Center H Emergency Services Institute (ESI). One primary mission of the institute is to develop model programs to better prepare internal disaster operations as well as to serve as a partner in the development of community and regional disaster plans.
- ESI has a division known as Special Operations. This division has developed Trauma Center H Special Operations Teams, and has supported the State Office of EMS State Medical Assistance Team initiative. Trauma Center H Special Operations now includes Public Event Teams, Disaster Medical Teams, Decontamination Teams

and Campus Police Tactical Teams. The Capital RAC SMAT team, of which Trauma Center H is the lead hospital, has recruited and trained approximately 100 members in the past year. The goal is to activate and deploy these teams for disaster events, such as mass casualty patient surges, patient decontamination events and/or hospital crowd surges. In the fall of 2005, the Special Operations team assisted the County Emergency Management and the Public Health Department with the influx of Katrina evacuees and deployed the Capital RAC SMAT team to another state for a 52-day field hospital mission. In July of 2006, the SMAT team was deployed to provide medical support to the Tall Ships event in another state. This event served as a training exercise for the SMAT Field Hospital Team and provided support to a small community hospital during the resulting surge in patient volumes.

#### Thinking Outside the Box

##### Taking Resources to the Field

- A hospital surge may be prevented if resources are taken to the scene, rather than “the scene coming to the hospital”. Trauma Center H has placed a significant amount of equipment and supplies on mobile, environmentally-controlled trailers. This allows for the rapid deployment of necessary equipment and supplies to other Trauma Center H campuses and/or to the community, should the county’s Emergency Management request these resources at the scene of an event. It is recognized that individuals are not to be deployed to the field unless they have been specifically trained. Trauma Center H is taking many efforts to train these Special Operations and State Medical Assistance Teams.
- Trauma Center H is an active participant in the State Trauma System. In the next several months, Trauma Center H will be receiving a 50-bed field hospital. The Field Hospital will provide the space and resources that can be used in a disaster surge situation, either in the field and/or on the Trauma Center campus.

##### Early Detection Practices

- Trauma Center H actively participates in a number of systems that provide mechanisms for early detection / trends of an emerging disease, believing that early detection will greatly impact patient outcome and the extent of a surge event.
- Trauma Center H’s Adult Emergency Department served as a beta site for an electronic system that provides syndromic information to the state health department in a timely manner. This software has now been installed in most hospitals in the State.
- Trauma Center H participates in several state early notification and communication systems, such as the Health Alert Network (HANS) and State Medical Asset Resource Tracking System (SMARTS). On a daily basis, hospitals in the State enter key information into the system; within minutes the state can assess the availability of the different types of beds, pharmaceuticals and other significant equipment, such as ventilators. The HANS system was very effectively in the management of an e-coli outbreak resulting from a state fair petting zoo in 2004.
- The Trauma Center H system has developed a formal policy that defines how medical, military, security and weather alerts that are received from external agencies are disseminated to key individuals and/or groups. Again, this is in recognition that key information must be available to individuals at various levels of the organization if there is to be a coordinated effort in response to an early detection and/or surge event.
- The Emerging Disease Management Plan for the organization provides Quick Reference Guides for frontline staff, as it is anticipated that the “first suspicious case” will be detected at that level. The plan provides a mechanism for notifying an expert team, who will take steps to quickly determine if there is a threat.

## 5. Evaluation of Practice:

### Examples of Changes in Practice

#### Emergency Department Registration in a Surge Event

- In 2005, it was recognized that the manual method for registering disaster victims was very cumbersome. There was difficulty in locating patients quickly, registration took an extended period of time, patients were not easily tracked in the ED alternate care sites and there was frustration with not having real-time information. In response, disaster patient packs were redesigned, incorporating the electronic Information Service registration system into the process. Preassigned disaster medical record numbers were preloaded into the registration system. Registrars now use mobile computers and are able to perform a "Quick Registration". The revised system was tested in a mass casualty chemical drill. The changes in practice verified a great improvement in the registration of patients and in the communication and availability of this information.

#### Emergency Medical Services (EMS) Bracelets

- The County EMS and Trauma Center H have coordinated their efforts on a method to share data and to track patients. EMS will soon be placing a bar coded bracelet on their patients. Upon arrival in the Emergency Department, the bracelet number will be entered into the Emergency Department's electronic system. This will be an important factor in the event of a sudden influx of patients, as it will allow for reconciliation and tracking of patients. It will always allow for a two-way exchange of data sharing between the hospitals and the EMS databases.

#### Trauma Center H Mass Casualty Planning with the County EMS

- Trauma Center H is an active participant with the County EMS for disaster planning. The county is in the process of revising its mass casualty incident (MCI) plan. The hospital will reference that plan when revising its MCI Plan to make sure the plans are compatible. This planning proved to be invaluable in 2005 when there was a passenger train derailment in the city. EMS successfully managed the scene, which resulted in zero self-referrals from the scene to the hospital.

#### Creation of Quick Response Guides

- These easy-to-read and concise guides/checklists provide staff with a quick reference for what steps to take when responding to a surge event.

#### Establish Additional Patient Care Areas

- As the result of a recent evaluation, a decision has been made to move all non-patient care related Administrative staff members off the trauma center campus to enable the renovation of additional space for patient care.

#### Reorganization of Surge Management Activities

In the spring of 2006, the existing capacity related groups were evaluated. The newly appointed Chief Operating Officer redesigned the system. In the new initiative, groups were identified to further improve the system. This includes Disaster Related Surge: The Trauma Center H Emergency Services Institute has been assigned to work on the plans related to the type of surge that occurs as a result of a disaster related event. It is recognized that with this event, there are several potential types and components to the surges that the hospital must be prepared to manage. These include:

- The care of the acutely injured patient.
- The potential for a mass casualty event that involves the need for decontamination. The challenge is to be able to provide decontamination to large numbers of people, including both adult and pediatric populations.

- The management of a biological event/emerging disease event that requires the need for negative pressure/isolation rooms.
- The care of the well, but concerned populations.
- Management of the surge of public (crowd) that can be expected to come to the hospital campus in response to a community disaster event.
- Management of the telephone calls and other communications related to a surge event that causes a telecommunications surge. There is a Task Force currently being formed to develop the planning for the management of this resulting surge.
- There will be situations when there is the need for the creation of beds that currently do not exist. A Task Force was formed to further develop potential capacity at the Trauma Center campus. This group is assessing potential space with the goal of establishing 50 additional beds within existing nursing units during a specified period of time. It has been identified what resources will be needed to make the space an extended Emergency Department Treatment Area and/or an inpatient Acute Care space.

#### Capacity Plan Development

- Task Forces have been formed for the Trauma Center campus; the stand-alone Emergency Department and the community hospital to develop a formal surge capacity plan for each site.

#### Process Improvement

- Committees will continue to evaluate which systems can be improved to manage daily operations as well as a sudden influx of patients. For example, in March of 2006, the hospital system experienced a 127% sustained surge of patients for a number of days. This event was evaluated in detail with 50 departments from all affected system sites submitting comments and recommendations for improvement. These recommendations are currently being reviewed and evaluated across the health system.

### **6. Outcome:**

Trauma Center H is careful to follow the continuous quality improvement processes. When it is identified that a practice and/or system process needs to change, measurements are consistently established to determine if the new goals are being accomplished and sustained. When it is identified that the established measures are not being met, the process and/or practice is evaluated and adjustments are made accordingly.

### **7. Application to Daily Operations:**

- Trauma Center H's surge planning has been successful because the capacity systems and processes are incorporated into daily normal operations.
- Concern for capacity and surge are a part of Trauma Center H's normal daily culture.
- The continuous focus on improvements in the management of capacity for normal operations makes the hospital system much more prepared for the successful management of a sudden influx of patients related to an acute field event, such as a plane crash or a more sustained surge event, such as the pandemic flu.
- Literature has documented that staff are more successful in response if the processes and documents that are used in disaster and/or surge situations are familiar to them. Trauma Center H attempts to use existing systems and processes, such as the Emergency Department electronic registration, whenever possible.
- Disaster preparedness initiatives have been written into the organization's strategic plan.

- Trauma Center H recognizes the need to engage the entire healthsystem in the planning process. The Trauma Center campus takes the lead, however, it is recognized that every individual in the Trauma Center H system has the responsibility to know his or her role in responding to an emergency event.
- The Emergency Services Institute has a primary mission to develop model disaster response systems. The Institute is also responsible for the Environment of Care activities. One of the seven programs is the Emergency Management Program. The Life Safety Program, the Security Program, the Utilities Program, the Medical Equipment Program, the Hazardous Materials and Waste Program and the general Safety Program all have components related to disaster response. In the current organizational structure, these programs are all integrated in a number of activities and committees. As a result, there is a daily focus on disaster preparedness within the organization. Trauma Center H recently was commended in its Emergency Management initiatives. In the July 2006 JCAHO accreditation visit, the JCAHO survey team commented that “This team has visited many hospitals and we are most impressed by the Environment of Care Program at Trauma Center H. Trauma Center H’s dedication to emergency management validates the commitment to the community.”