



A survey team from the American College of Surgeons came to Denver from May 17-20, 2009, to conduct a consultative review of Colorado's trauma system.

## ACS Recommendations

### 1. Injury Epidemiology

- a. Develop a relationship with the new school of public health and identify injury epidemiology projects for graduate students to increase the depth and breadth of injury data that can be analyzed. *(page 13)*
- b. Actively recruit other agencies, academic centers, institutions, the Colorado Injury Control Research Center, the Rocky Mountain injury institute, etc. to expand the injury epidemiology capabilities. *(page 13)*
- c. Continue the partnership with the Department of Transportation and share the trauma registry and MATRIX data so that data linkage with other important databases occurs routinely. *(page 13)*
- d. Move toward development of trauma datasets (trauma registry and MATRIX) that are population-based. *(page 13)*
- e. Expand the focus of the trauma system's injury epidemiology to report on trauma patient outcomes for selected priority injury mechanisms in the state's injury strategic plan. *(page 13)*
- i. Relate these patient outcomes to the functioning of the trauma system
- f. Modify the definition of trauma deaths for monitoring and reporting to exclude poisonings and drowning so that findings correspond to the patients treated by trauma centers *(page 14)*

### 2. Indicators as a Tool for System Assessment

- a. Convene a group of 30-40 key stakeholders identified from trauma directors, trauma managers, rehabilitation personnel, prehospital personnel, select Regional Emergency Medical and Trauma Advisory Committee (RETAC) representatives, public health, public safety, emergency preparedness, and others and conduct a facilitated BIS evaluation. *(page 16)*
- b. Incorporate the findings of the benchmarks, indicators and scoring (BIS) assessment into the formal trauma system plan. *(page 16)*
  - i. Identify trauma system priorities and establish targets for change in key indicators, based upon the initial BIS scoring.
- c. Conduct repeated measures of key indicators to mark trauma system development progress over time. *(page 16)*
- d. Report progress to the trauma community, media, and legislators. *(page 16)*

### **3. Statutory Authority and Administrative Rules**

- a. Revise the statute to authorize limits on level and location of trauma centers commensurate with patient needs. *(pages 8, 20)*
- b. Assure the protection of the data and the trauma quality improvement process at local, regional, and state levels. *(pages 8, 20)*
  - i. The EMTS Section should establish administrative rules or take any other necessary action.
  - ii. Seize the opportunity to incorporate protection for the multidisciplinary performance improvement peer review process during the review of the sunseting Medical Practice Act.

2

- c. Consolidate all regulatory oversight of emergency medical services (EMS) and trauma system functions within the Colorado Department of Public Health and Environment through the EMTS Section. *(pages 8, 20)*
  - i. This includes responsibilities and authorities currently assigned to the Board of Medical Examiners, Department of Public Safety, and Colorado counties.
- d. Enforce 100% submission of EMS data by EMS agencies to the EMTS data collection system. *(page 20)*
  - i. Promote collaboration between the EMTS Section and counties to achieve compliance.
- e. Dedicate a portion of the new grant funds for trauma system development. *(page 20)*
  - i. Priority focus areas include a statewide needs assessment, development of a trauma system plan, a quality improvement process, and a preventable mortality study.
- f. Assure all hospitals being designated as trauma centers at levels I, II, and III meet the established criteria without waivers. *(page 20)*
- g. Assure compliance with the triage and transfer criteria for trauma patients on a continual basis and adjust the rule as necessary. *(page 20)*

### **4. System Leadership**

- a. Create a Multidisciplinary Trauma Advisory Committee (MTAC) of State Emergency Medical and Trauma Advisory Committee (SEMTAC) to assist SEMTAC in addressing trauma system issues. *(pages 8, 23)*
- b. Task the MTAC to oversee all clinical components of the trauma system, including quality improvement and compliance with clinical care guidelines (e.g., trauma triage, interfacility transfer). *(page 23)*
- c. Assure that SEMTAC supports the Lead agency's efforts in dealing with trauma system issues (e.g. monitoring each phase of trauma care, the trauma center designation process, etc.) *(page 23)*
- d. Provide guidance to the Regional Emergency Medical and Trauma Advisory Committees (RETACs), through the SEMTAC, regarding priority trauma system issues or projects. *(page 23)*
- e. Specify priority tasks in the RETAC contract in support of state trauma system development and hold them accountable for the accomplishment of those

priorities. (page 23)

f. Establish an infrastructure for RETACs to collaborate and regularly communicate with each other for exchange of programmatic issues, best clinical practices, prevention programs etc. (page 23)

g. Fulfill the state mandate for system-wide quality improvement and positively influence public policy, through a collaborative effort involving the lead agency, with support of SEMTAC, and in concert with RETACs and other community leaders. (page 23)

### **5. Coalition Building and Community Support**

a. Ensure the involvement of the State American College of Surgeons Committee on Trauma and trauma center leadership in the Multidisciplinary Trauma Advisory Committee functions and activities. (page 25)

3

b. Encourage trauma stakeholders to continue outreach to elected officials to increase the number of legislative champions. (page 25)

c. Expand the trauma stakeholders to include representation from mental health, rehabilitation, community organizations, the media, and the public. (page 26)

### **6. Lead Agency**

a. Employ a 1.0 FTE physician state medical director to oversee the clinical aspects of the trauma and EMS system. (pages 8, 29)

i. This position will require expertise in both trauma and EMS clinical care.

b. Consolidate all regulatory oversight of EMS and trauma system functions within the EMTS Section. (page 29)

i. This includes responsibilities and authorities of the Board of Medical Examiners, Department of Public Safety, and Colorado counties.

c. Enforce trauma system standards across the State in both hospital and prehospital phases of care. (page 29)

d. Reassess the roles and responsibilities of the EMTS Section personnel in light of the opportunity provided by the statewide trauma system needs assessment and planning initiative. (page 29)

i. Consider realigning the responsibilities of various positions to improve the coordination and management of new planning and implementation activities.

### **7. Trauma System Plan**

a. Perform a *patient-focused* in-depth statewide *needs assessment study* to determine the appropriate level and geographic location of trauma centers for the state. (pages 8, 34)

b. Develop a plan for statewide trauma system implementation based on the needs assessment study, using the authority of the existing enabling legislation. (pages 8, 34)

i. Use the Health Resources and Services Administration's Model Trauma System Planning and Evaluation document as a guideline for system development.

c. Evaluate and consider refining Colorado's definition of an "inclusive system."

(pages 9, 34)

- i. Modify rules and regulations to assure optimal patient outcomes and a model of value-based medical care
- d. Utilize the Multidisciplinary Trauma Advisory Committee to complete a trauma system plan. (page 35)
- e. Develop and enforce standardized protocols, triage, transfer guidelines and care plans. (page 35)
- f. Set up monitoring and tracking data collection based on patient outcomes. (page 35)
- g. Create incentives and establish goals to reduce the number of trauma centers that do not meet criteria at the time of the redesignation application. (page 35)
- h. Set a timeline and deadline to implementation of the state trauma system plan. (page 35)

4

## **8. System Integration**

- a. Ensure that during the creation of a trauma plan the integration with EMS, mental health, social services, rehabilitation, emergency preparedness (MCI), and public health occurs. (page 38)
- i. Consult the HRSA *Model Trauma System Planning and Evaluation* document, “Phases of a Pre-Planned Trauma Care Continuum” (page 8) for guidance on optimal trauma system integration for patient care.
- b. Utilize the new SEMTAC Multidisciplinary Trauma Advisory Committee (MTAC) to ensure trauma system integration with all emergency preparedness activities. (page 38)
- c. Consider including representation from other time-sensitive clinical conditions and system responses, such as stroke and ST elevation myocardial infarction (STEMI) when developing the trauma system plan. (page 38)

## **9. Financing**

- a. Create a statewide picture of the costs and revenues associated with the provision of trauma care. (page 41)
- i. Add financial data to the required reporting from trauma centers.
- b. Provide an annual public report of the costs and benefits of the trauma system and trauma care in Colorado. (page 41)
- c. Develop trauma system plan priorities and commit appropriate financial resources for the plan implementation. (page 41)
- d. Solve the secondary transfer billing problem so that ambulance services can recover at least a portion of their operating costs for patient transfers. (page 41)
- e. Require all EMS agencies to charge for care and transportation at rates reflecting the cost of providing the service. (page 41)
- i. This should be a prerequisite to applying for grants through SEMTAC.
- f. Enhance the relationship between the State’s emergency preparedness program and a trauma system to ensure that Assistant Secretary for Preparedness and Response (ASPR) grant funds help support trauma system development. (page 42)

g. Pursue appropriate federal funding streams to support trauma system development. (page 42)

#### **10. Prevention and Outreach**

a. Complete development of the injury prevention website to make prevention program resources more accessible to injury partners. (page 45)

b. Integrate tertiary injury prevention into the planning of injury control priorities for the state. (page 45)

c. Enhance communication and collaboration between the Injury Community Planning Group, trauma centers, and other partnering organizations to foster commitment for use of evidence-based injury prevention strategies recommended in the strategic plan. (page 45)

#### **11. Emergency Medical Services**

a. Transfer the responsibility for licensing EMS agencies and ground ambulances from county commissioners to the EMTS Section. (page 52)

5

b. Allow national accreditation of EMS agencies (Commission on Accreditation of Ambulance Services-CAAS) for eligibility for Colorado ground ambulance licensure. (page 52)

c. Monitor and assure appropriate local EMS medical director performance. (page 52)

d. Standardize the pediatric age criteria (less than 15 years) for EMS protocols and triage and transport destination determination. (page 52)

e. Require standardized education for EMS dispatchers. (page 52)

f. Consider obtaining a NEMSIS-compliant (gold) commercial information system that allows for the selection of clinically relevant data elements. (page 53)

g. Eliminate the discrepancy between EMS provider capabilities and the needs of the critically ill patient who requires transport between facilities. (page 53)

i. Implement rules, develop a standardized curriculum, develop advanced EMTParamedic certification, or whatever means is necessary to improve the quality of critical care transport for injured patients.

#### **12. Definitive Care Facilities**

a. Perform a *patient-focused* in-depth statewide *needs assessment study* to determine the appropriate level, number, and geographic location of trauma centers for the state. (pages 9, 59)

b. Preserve the exemplary state-wide commitment to care of the injured patient, and assure that this commitment is guided by an inclusive, patient focused, trauma system plan (i.e. appropriate number, level and location of trauma centers). (page 59)

c. Develop a request for proposal process to identify potential level I and II trauma centers for the state. (page 59)

i. Define the expectation of similar clinical care with expanded outreach, education, and clinical support expected of the level I trauma centers.

d. Assist rural facilities with limited resources to achieve designation. (page 59)

- i. Provide outreach and support (by the State and level I and II trauma centers), grants, and other interventions.
- ii. Continue to collaborate with the Colorado Rural Health Center.
- e. Focus pediatric trauma care at the regional pediatric trauma center (RPTC) as a regional resource. *(page 59)*

### **13. System Coordination and Patient Flow**

- a. Establish a statewide central communications system to coordinate and secure expeditious transports and interfacility transfers with one call. *(pages 9, 63)*
- b. Utilize new technology to support communications for consultations and transfer arrangements. *(page 63)*
  - i. Wireless/Telemedicine
- c. Develop a mechanism and routinely monitor compliance with triage and transfer guideline rules. *(page 63)*
- d. Utilize the current national standards to update and modify the prehospital triage and hospital transfer guidelines. The Centers for Disease Control and the American College of Surgeons have established revised guidelines. *(page 63)*
- e. Ensure compliance with all specialty care transfer guidelines (traumatic brain injury, spinal cord injury, burns, pediatrics). *(page 63)*
- 6
- f. Establish operational rules for critical care transport. *(page 63)*
- g. Establish statewide EMS protocols that take into account variances due to time, distance, and personnel resources in rural areas of Colorado. *(page 63)*
- h. Secure funding to provide additional Rural Trauma Team Development Course (RTTDC), in conjunction with the Colorado Rural Health Center, to rural areas to encourage the appropriate stabilization and transfer of trauma patients. *(page 64)*
- i. Create a system of seamless patient transport across county lines to the appropriate facilities under regionalized medical direction. *(page 64)*

### **14. Rehabilitation**

- a. Collect data elements related to rehabilitation and utilize these data to inform the trauma system. *(page 67)*
- b. Assure rehabilitation representation on the Multidisciplinary Trauma Advisory Committee. *(page 67)*
- c. Assure rehabilitation specialist involvement in the systemwide needs assessment. *(page 67)*
- d. Develop process improvements regarding difficult placement issues, e.g., ventilator dependent patients and unfunded patients. *(page 67)*

### **15. Disaster Preparedness**

- a. Assure that input from the State Emergency Medicine and Trauma Advisory Committee (SEMTAC) and Regional Emergency Medicine and Trauma Advisory Committees (RETACs) is incorporated into state, regional, and local

disaster plans and activities. (page 70)

b. Mandate dialog between Emergency Preparedness and Response Division (EPRD) and the new Multidisciplinary Trauma Advisory Committee (MTAC) to optimize trauma system improvements for disaster response. (page 70)

### **16. System-wide Evaluation and Quality Assurance**

a. Develop a statewide trauma system performance improvement plan (PI) in collaboration with trauma system constituents within the next 12 months. (pages 9, 74)

i. Consider using a contractor for development of the plan

ii. Query other states for a template.

b. Assure the protection of the data and the trauma performance improvement process at local, regional, and state levels. (page 74)

i. The EMTS Section should establish administrative rules or take any other necessary action.

ii. Seize the opportunity to incorporate protection for the multidisciplinary performance improvement peer review process during the review of the sunseting Medical Practice Act.

c. Hire a trauma program specialist with clinical expertise to educate and assist the RETACS and small rural facilities with the PI process. (page 74)

i. Ensure regional plans for PI are integrated into the state process.

d. Establish system PI audit filters and measures that address process and outcomes. (page 75)

e. Provide educational opportunities to orient and train all trauma system stakeholders on the recommendation of issues to be investigated. (page 75)

7

f. Ensure the data collected from hospitals and EMS is complete, validated, consistent, and comprehensive to effectively conduct system PI. (page 75)

g. Establish regional medical directors within the RETACS to support the implementation of regional PI. (page 75)

h. Provide access to data for the RETACs to facilitate regional PI under the leadership of the regional medical director. (page 75)

i. Monitor the triage and transfer guidelines and protocols for compliance routinely. Require plans of correction to address deviations, and trend deviations to determine a need for change in the protocol or guideline. (page 75)

j. Ensure that the evaluation of the state trauma system is ultimately inclusive of the entire continuum of care (dispatch, prehospital, emergency department, trauma care, and rehabilitation) to fully assess impact of trauma care on mortality, as well as morbidity. (page 75)

k. Build upon the best practice models of PI being promoted within individual RETACs and existing outreach programs. (page 75)

### **17. Trauma Management Information Systems**

a. Collect trauma registry data from all hospitals in order to conduct a complete and comprehensive assessment of trauma care in Colorado. (pages 9, 78)

i. Select a minimum dataset for trauma participating facilities at lower level designations or without designation in addition to the dataset

already collected from hospital discharge.

- ii. Continue development of a web-based portal for data entry.
- b. Assure the protection of the data and the trauma performance improvement process at local, regional, and state levels. *(page 78)*
  - i. The EMTS Section should establish administrative rules or take any other necessary action.
  - ii. Seize the opportunity to incorporate protection for the multidisciplinary performance improvement peer review process during the review of the sunseting Medical Practice Act.
- c. Work with other states using Clinical Data Management (CDM) software (e.g. Utah, Ohio, and North Dakota) to encourage the development of a CDM statelevel capture and reporting module with routine reporting features included. *(page 79)*
- d. Convene the trauma managers and trauma directors to define the key data reports that need to be run on a quarterly and annual basis. *(page 79)*
  - i. Provide those report parameters to CDM (see previous recommendation).
  - ii. Develop SAS Statistics routines that will allow the regular generation of the data reports until the CDM module is developed.
- e. Produce and distribute reports on a quarterly and annual basis to all data contributing facilities and to personnel and committees charged with system oversight and quality improvement. *(page 79)*
- f. Conduct a cost/benefit analysis and, if indicated, use a portion of the initial year's Highway User's Tax grant program funds, to purchase an "off the shelf",  
8  
NEMSIS compliant (Gold Level) program with multiple options for data input at the provider level and robust reporting at the state level. *(page 79)*
- g. Develop a unique patient identification system to allow for patient tracking through all aspects of the trauma system from initial contact with EMS to disposition at rehabilitation. *(page 79)*

## **18. Research**

- a. Appoint a task group under the aegis of the Multidisciplinary Trauma Advisory Committee to develop a state trauma system research agenda that will encourage the systematic and scientific examination of all elements of trauma system performance. *(page 83)*
- b. Improve the accuracy and validity of the Colorado Trauma Registry and MATRIX data sets, or their successors, to support systems research. *(page 83)*
- c. Partner with appropriate academic institutions and research agencies that can provide resources (personnel, research design knowledge, and financial support) to assist in the completion of the trauma system research agenda. *(page 83)*
- d. Conduct a statewide preventable mortality study that reports preventable, potentially preventable, and opportunities for improvement (regardless of preventability) across the system and all phases of care. *(page 83)*

19. **Focus Question 1:** Does Colorado have too many level I/II trauma centers along the Front Range?

- a. Complete an in-depth statewide assessment of patient needs and resources available.
- b. Obtain a revised statute or regulations permitting a limitation in the number of designated trauma centers based on the need of patients rather than institutional commitment.
- c. Develop a request for proposals (RFP) to identify potential level I and II trauma centers for the state. Clearly define the expectations of similar clinical care with expanded outreach, education, and clinical support expected of the level I trauma center or only level II trauma center in the region.
  - i. Base the designation process on creating optimal health care value (quality/cost) and avoid expensive duplication and non-productive competition.

20. **Focus Question 2:** How do we simplify regulatory oversight of the care delivered by prehospital personnel?

- a. Seek input from SEMTAC regarding a consolidated model of EMS regulation.
- b. Convene a meeting of representatives from the counties, the Board of Medical Examiners and the Department of Public Safety to explore barriers and opportunities for a consolidated model of EMS regulation.
- c. Seek legislative and rule change for the consolidated model if agreement is reached with other agencies and groups.
- d. Plan the transition to the consolidated model if legislation and rule change is successful.

21. **Focus Question 3:** What activities and/or policies can Colorado consider to keep rural trauma centers interested/willing/able to stay in the trauma system and remain designated?

9

- a. Ensure that level I, II, and III trauma centers provide outreach education to level IV and V trauma centers and EMS agencies according to routine referral and transport patterns.
- b. Establish Memoranda of Understanding between level I, II and III facilities and level IV and V facilities to provide education, conduct performance improvement, and repatriate patients back to their communities.
- c. Attend the Colorado Hospital Association meetings to educate the chief executive officers of rural hospitals about the benefits of trauma system participation and to gain input regarding rural EMS and trauma issues.
- d. Clearly define roles and responsibilities of level IV and V trauma centers in the state trauma system plan.
- e. Conduct a cost benefit analysis for level IV and V trauma centers including possible revenue generated from UB04 trauma team activations.
- f. Allow hospitals applying for level IV and V trauma center designation to seek

funding from the EMT and FLEX grant programs for resources needed to meet criteria.

g. Encourage further implementation and utilization of telemedicine to increase accessibility of rural providers to education and patient consultation.

h. Engage community support through media campaigns.

i. Allow level IV and V trauma centers to apply for EMTS grant funds to support injury prevention programs within their communities.

j. Secure funding to provide prehospital trauma education (e.g. Prehospital Trauma Life Support and Basic Trauma Life Support) and RTTDC in rural communities.

k. Ensure representation of rural providers on all task forces, workgroups, and committees pertaining to trauma system development.

**22. Focus Question 4:** What should the leaders of the EMTS system throughout Colorado be doing today to ensure appropriate succession planning at all levels of the system?

a. Support the development of an institutional memory by electronically archiving all documents of historical significance to EMS and trauma system development in Colorado and, as appropriate, nationally.

b. Create a mentor/mentee matching system with appropriate access to resources and support to offset the mentors' time.

c. Ensure that new staff and other newly appointed leaders are provided with a specific historical orientation to trauma and EMS system development in Colorado. The overview provided the first night of the TSC visit serves as an excellent starting point for this task.

**23. Focus Question 5:** How can the Colorado EMTS system more effectively transport critically ill patients from outlying facilities across vast distances to the Level I or II care that the patient needs?

a. Develop an advanced practice EMT-Paramedic training program.

i. Compile a list of commonly required procedures and assessments required for interfacility transport of patients with severe injuries.

10

ii. Identify an EMS training academy with access to appropriate faculty and a simulation laboratory to teach the performance of essential advance practice skills.

iii. Develop a curriculum covering either the entire spectrum of essential skills or a modular format to support a menu driven list of enhancements.

iv. Develop a process to evaluate the competence of newly trained advance practice EMT-Paramedics prior to certification.

v. Identify a source of funding for provider training.

b. Develop a performance improvement program to monitor the care of seriously injured patients provided by advance practice EMT-Paramedics during long

transports.

c. Develop a mechanism for “on call” or “stand by” resources to provide personnel

and an ambulance for the performance of critical care interfacility transports.

d. Consider mechanisms (e.g., US Senate Bill 1066) to optimize funding for rural and frontier ambulance services and to provide for “surge” or “flex” capacity to perform long distance transfers between remote primary hospitals and distant tertiary centers