

***MINNESOTA STATEWIDE
TRAUMA SYSTEM***
MINNESOTA DEPARTMENT OF HEALTH



**State Trauma Advisory Council
Education Work Group
Final Report**

March 2009

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Charge

At their June 2007 meeting the STAC approved the charge for an ad hoc education work group that will:

- Evaluate essential clinical lab skills as an element of the educational requirements of the trauma system
- Examine trends in simulated versus live tissue training
- Assess how essential training will be made available to practitioners state wide.

At the September 2007 meeting the following was added: Assess how to assist facilities that employ mid-level practitioners as the sole emergency department provider without physician backup to ensure that their quality improvement and educational needs are being adequately addressed.

These charge elements were translated into a task list and prioritized:

1. Assess national training and skills requirements related to state trauma systems and distill the clinical (lab) skills necessary for Minnesota trauma care providers
2. Distinguish the values of simulated skill labs versus live tissue skill labs with regard to current and future system needs.
3. Assess how to assist level IV trauma hospitals that employ mid-level practitioners as the sole emergency department provider without physician backup to ensure that their quality improvement and educational needs are being adequately addressed.
4. Develop a vision future Minnesota trauma educational requirements
5. Address and make recommendations regarding increasing both the number of ATLS and CALS courses offered throughout the state and the instructor pools for both

Membership

The multi-disciplinary work group membership consisted of both STAC members and trauma care professionals with a special interest or expertise in education and/or simulation training.

- Terri Bergeron, R.N.; ENA State Trauma Committee chair; pediatric trauma coordinator, Saint Mary's Hospital-Mayo Clinic
- Darrell Carter, M.D.; director and co-founder of CALS
- Tom Crowley, chief executive officer of St. Elizabeth's Hospital in Wabasha
- John Cumming, M.D.; general surgeon and ACS COT member
- Shonette Doggett; manager of education for Regions EMS
- Jane Gisslen, R.N.; STAC member and emergency department manager at Fairview Red Wing Medical Center
- Todd Joing, M.D.; emergency physician with Fairview Southdale Hospital
- Peter Lindbloom, P.A.; STAC member and director of the emergency department for Mille Lacs Health System, Onamia
- Dave Milbrandt, M.D.; emergency physician with Fairview Lakes Medical Center, Wyoming
- Kristi Moline; manager of Minnesota EMSC
- Paul Stelter, EMT-P; director of South Central Minnesota EMS Region
- Linda Vogel, R.N.; STAC member and trauma manager for St. Mary's Medical Center, Duluth
- Mike Wilcox, M.D., chair; STAC member, emergency physician and CALS instructor

Summary and Recommendations

The work group met initially in December 2007, then five more times until January 2009. What follows is a summary of their assessments and recommendations.

Task #1: Assess national training and skills requirements related to state trauma systems and distill the clinical (lab) skills necessary for Minnesota trauma care providers.

Current Status

While ATLS and TNCC represent the industry training standard nationally for physicians and nurse respectively, there does not appear to be a consistent, industry-wide training/education standard. Training requirements are not based on data or research. Rather, the standard is set by the ACS for verified trauma centers. There is little or no useful data on the subject. There appears to be a universal need for collaborative research and data collection. Since conclusive data does not appear to exist and rural providers tend to report low comfort levels with the trauma skills, the value may be in focusing on the basics and measuring provider confidence levels rather than patient outcomes.

This task was largely the result of an inquiry from the CALS program to define a set of trauma care skills that, when learned in a simulation environment, would eliminate the trauma system requirement for CALS-trained providers to complete the Benchmark Lab.

Recommendation

After significant dialogue, the work group formulated a recommendation by general consensus that the clinical (lab) skills necessary for Minnesota trauma care providers are those taught in the ATLS course. Specifically:

- Endotracheal intubation
- Esophageal intubation detector
- Endotracheal tube introducer
- Esophageal tracheal Combitube™ airway
- Intubating laryngeal mask airways (LMA)
- Cricothyrotomy
- Needle cricothyrotomy
- Needle thoracostomy for tension pneumothorax
- Chest tube insertion, adult
- Percutaneous pericardiocentesis
- Intraosseous needle placement
- Cannulation of the femoral, internal jugular and subclavian veins
- 1° & 2° trauma assessment
- X-ray assessment of chest
- CT assessment of head
- Helmet removal
- X-ray assessment of spine
- Spine immobilization/logrolling
- Leg traction splint
- X-ray assessment of skeletal injuries [Diagnostic peritoneal lavage intentionally excluded]

If these skills are incorporated into the CALS Provider Course and taught in a similar fashion to ATLS (i.e., mannequin simulator), the Benchmark Lab should no longer be required to meet the trauma education requirement for physicians and mid-levels practitioners.

Note: At the March 2008 STAC meeting the general membership approved the work group's recommendation to approve CALS integration of ATLS skills, minus DPL, into the course in place of the Benchmark Lab requirement.

Task #2: Distinguish the values of simulated skill labs versus live tissue skill labs with regard to current and future system needs.

Current Status

Little literature is available comparing simulated skill training to live tissue skill training with respect to competency and retention outcomes. Six studies evaluating simulation training were considered.¹ In general, simulated skills training is thought to be adequate for several applications. However, there may be value in encouraging providers to seek the live tissue experience at least once. The two courses currently approved to prepare physician and mid-level providers for trauma designation are ATLS and CALS (Provider Course + Benchmark Lab).

Advanced Trauma Life Support courses utilize the TraumaMan mannequin to teach certain essential trauma skills during the two-day class. Students travel to the site of the course which has always been at a level I or II trauma center.

The CALS Benchmark utilizes a live animal model to teach certain essential trauma skills. After completing the two-day Provider Course at or near their rural facility, providers travel to the Twin Cities to complete the one-day lab which is offered at two venues in Minneapolis. This live tissue lab is considerably more expensive than a mannequin lab. Four students (two of them physicians or mid-levels) can take the course per offering. It is offered only a few times per month. There is a significant back log of students waiting to experience the lab, a direct result of the trauma system educational requirements. The CALS program is planning to integrate mannequin trauma skills into the Provider Course. The program would like input from the MN ACS COT to create an experience that is similar to that of the ATLS course.

Several other simulation labs have recently emerged in the state, such as Fairview Lakes Medical Center, Regions Hospital, Hennepin Technical College and Children's Hospitals and Clinics. Some are mobile while others are fixed. They are being used for a wide range of situational training for various medical providers including physicians, nurses and EMS personnel.

Recommendation

While the live tissue experience is valuable, there is no reasonable, practical way to make it readily available to all those who need it on a regular basis. A simulated lab experience using mannequins allows for more frequent instruction and widespread distribution of the practice opportunity. While live tissue training should not be discouraged, mannequin training is associated with cost savings, portability and flexibility and should be embraced as a sufficient alternative to live tissue training.

¹ Haim Berkenstadt et al., "Evaluation of the Trauma-Man[®] Simulator for Training in Chest Drain Insertion," *European Journal of Trauma*, ISSN1439-0590, Volume 32, Number 6, December 2006.

Chapman, D.M. et al., "Emergency Thoracotomy: Comparison of Medical Student, Resident, and Faculty Performances on Written, Computer, and Animal-Model Assessments," *Acad. Emerg. Med.*, 1(4), Jul-Aug 1994, pp. 373-81.

Gardiner, Q. et al., "Technique Training: Endoscopic Percutaneous Tracheostomy," *Br J Anaesth*, 81(3), September 1998, pp. 401-3.

Liu, A., Kaufmann, C., Ritchie, T., "A Computer-Based Simulator for Diagnostic Peritoneal Lavage," *Stud. Health Technol. Inform.*, 81, 2001, pp. 279-85.

Kaufmann, C., Liu, A., "Trauma Training: Virtual Reality Applications," *Stud. Health Technol. Inform.*, 81, 2001, pp. 236-41.

Custalow, C.B. et al., "Emergency Department Resuscitative Procedures: Animal Laboratory Training Improves Procedural Competency and Speed," *Acad. Emerg. Med.*, 9(6), June 2002, pp. 575-86.

However, simulation labs cannot be effectively taught by just anyone. Simulated mannequin labs require operators who are both skilled with computers and possess a strong clinical background. These characteristics should be considered when evaluating any proposed simulation training.

Task #3: Assess how to assist level IV trauma hospitals that employ mid-level practitioners as the sole emergency department provider without physician backup to ensure that their quality improvement and educational needs are being adequately addressed.

Current Status

Several hospitals in Minnesota employ nurse practitioners and/or physician assistants as lead emergency department providers. Most have a physician backup who is available to physically respond to the emergency department if the mid-level should require assistance. Some hospitals have a physician available for consultation by telephone only. Although the number of these is unknown, it is suspected to be a minority of the hospitals, perhaps only six or seven.

Recommendation

The work group identified several means to assist mid-levels at level IV trauma hospitals including:

- Provide critical skills protocol book for the emergency room.
- Develop and distribute video of procedures.
- Schedule mobile lab visits.
- Provide opportunities to shadow providers in the busy metro centers.
- Establish regular (e.g. monthly) teleconferences or video conferences for case reviews – like HCMC’s video Stab conferences. Perhaps limit these to just the most difficult or problematic cases.
- Develop a cohort of outside providers who are competent to review cases and provide feedback. (Legal protections through a peer review declaration would need to be developed.)
- Encourage receiving hospitals to provide feedback.
- Develop a resource book for trauma program medical directors/advisors.

While all of these opportunities were considered valuable, three were thought to be high priority for not only mid-levels, but also for referring physicians:

1. Establish a means to assist hospitals with the peer review of trauma care. In facilities with few practitioners, the providers have an existing personal relationship that can hinder the necessary candid and critical peer review of cases. Referring these cases to an impartial peer reviewer would provide the valuable feedback the providers seek. This might be accomplished by utilizing self-identified, volunteer reviewers throughout the state or within an RTAC.
2. The ability to improve trauma care is hampered by the inability to receive relatively immediate feedback from tertiary care facilities about the care provided at the referring hospital and the status of the patient’s condition. Receiving providers have difficulty providing meaningful feedback in a timely manner due to the clinical demands of the case itself. This might be accomplished with a statewide standardized mechanism for providing and retrieving feedback, perhaps with the use of technology (e.g., Web). Several factors compound this problem:
 - Feedback is simply not reaching the people who benefit the most from it.
 - The content of the feedback is inconsistent from institution to institution.
 - Feedback arrives in varied formats that are inconsistent from institution to institution.
 - Feedback arrives at varied times. Some receiving facilities call shortly after the patient’s arrival. Others provide feedback upon the patient’s discharge.

Work with receiving trauma hospitals to establish a standardized and effective method for providing meaningful and useful feedback to referring facilities.

3. Develop a Q&A forum where emergency providers can pose clinical questions and receive a response from a practitioner more experienced in trauma care, either from STAC or from level Is & IIs. This might be in the form of a discussion group, Web blog or listserv.

In addition to these priorities, mid-level practitioners (and all providers) would benefit most from more education and skill development.

Establish a work group of the STAC to work toward the recommendations addressed in this section. Many members of the Education Work Group may be interested in continuing work on this project.

Task # 4: Develop a vision for future Minnesota trauma educational requirements:

- Physicians/mid-levels
- Nurses
- EMS Personnel

Current Status

No currently-available course meets all the educational needs of trauma care providers. Currently, the training requirements as established by trauma system criteria are as follows:

Physicians

Physicians who are not board-certified in emergency medicine or general surgery must successfully complete an ATLS or CALS (including the Benchmark Lab or trauma module) course every four years. CALS incorporates specific pediatric education into its curriculum while ATLS does not. Most states recognized only ATLS, but Minnesota considers CALS to be acceptable training for trauma providers as well for several reasons:

- Its curriculum emphasizes rapid assessment, emergent interventions and rapid transfer.
- CALS teaches a team approach to the resuscitation.
- It is taught on-site in the rural setting.
- The cost to the hospitals is offset by federal and state grants.
- The federal government has recently encouraged states to utilize CALS to support their trauma systems.
- The ACS made no recommendation for or against the acceptance of CALS in the Minnesota trauma system during their consultation visit in 2007.
- The availability of CALS removes an educational barrier to the realization of a truly inclusive trauma system.

Nurses

Nurses responsible for emergency and/or critical care (includes ICU nurse at level III facilities) must have successfully completed appropriate professional trauma education. This can be a system-approved course (TNCC, CALS Provider Course, ATCN, CATN) or an in-house class that addresses the following objectives:

1. Identify the common mechanisms of injury associated with blunt and penetrating trauma.
2. Describe and demonstrate the components of the primary and secondary nursing assessment of the trauma patient.
3. List appropriate interventions, based on the assessment findings, for recognized and suspected life-threatening and non-life-threatening injuries.
4. Correlate signs and symptoms to specific pathophysiological changes as they relate to potential injuries.
5. Describe the ongoing assessment and methods used to evaluate the effectiveness of the interventions.
6. Examine the facility's specific criteria and protocols for admission or transfer of the trauma patient.

TNCC is a challenging course, especially for new nurses. Its target population is emergency nurses and, thus, is not ideal for the ICU nurse. Also, certification is obtainable by registered nurses only. Although there are some opportunities for licensed practical nurses to audit the course, training options for LPNs is somewhat more limited. The CATN and ATCN classes are scarce. CALS is appropriate training for both RNs and LPNs working in all patient care settings within level III and IV trauma hospitals since the

curriculum addresses critical care, the universal approach to critically injured patients, teamwork, and the use of a rapid response team.

Educational institutions and level I or II trauma hospitals should assist hospitals that desire to train their nurses in house.

Pediatric-specific trauma education is not incorporated into TNCC, CATN, ATCN or the trauma system education objectives for nurses.

EMS Personnel

There are no trauma system training requirements for EMS personnel. There does not appear to be a standard across the nation for trauma training beyond the general requirements in the DOT curriculum.

There has been a significant decrease in the demand for BTLS and PHTLS from ambulance services statewide. Many low-volume ambulance services see mostly medical patients; much of their training is focused there. The approach to a trauma patient requires a different mind-set, preparation for which appears to be lacking. Scenario-based trauma training may be more effective than didactic instruction. EMS providers regularly get a review of what they already know but little new information.

Recommendation

1. The ACS's Rural Trauma Team Development Course (RTTDC) is new and has been offered only once in Minnesota. The RTTDC was created to assist rural hospitals with the development of their trauma teams, addressing the common problems encountered in the initial assessment and stabilization of the injured patient. The work group or STAC should audit the new RTTDC before making any recommendations regarding its role in the Minnesota trauma system. Its curriculum does not include the clinical lab skills thought by the work group to be essential for physician and mid-level providers. However, it may be a good adjunct course for all levels of trauma providers.
2. The large number of trauma care providers who need trauma training and the limited resources to provide and fund it should influence the type of education that is required. Some general opportunities identified for consideration were:
 - Provide packaged, focused educational offerings, ideally driven by state, regional and local data, for trauma care providers, EMS medical directors, trauma program medical directors, etc.
 - Consider whether needs are best met by offering training based on trauma volume (i.e., the lower the volume of trauma the greater the volume of training needed to maintain competency).
 - Incorporate EMS providers when hospitals participate in simulation training (e.g., mobile simulation labs).
 - Consider whether or not the Minnesota trauma system should develop its own trauma training course to optimize trauma educational curriculum or work with the existing training options.
 - Utilize regional organizations (e.g., RTACs, EMS/hospital regions) to offer training more widely/regularly.
 - Consider sponsoring an annual statewide conference including a simulated lab component.

Physicians

1. When considering trauma education, a distinction must be drawn between comprehensive initial training and ongoing skill competency. Do not assume that board-certified emergency medicine physicians and general surgeons do not need regular trauma-specific training to remain competent.

2. Develop a mechanism to ensure that providers receive pediatric-specific trauma training.
3. The CALS program has developed a six-disc set of CDs that visually illustrates common, emergently-performed skills available for about \$150. Level IIIs and IVs should consider making these available to their providers.
4. Promote the opportunity for family practice residents to work in a rural emergency department for four to six weeks during their training.

Nurses

1. The Pediatric Emergency Assessment, Recognition and Stabilization (PEARS) course and Emergency Nursing Pediatric Course (ENPC) are not trauma specific. It is appropriate to continue to exclude them from the list of acceptable courses.
2. Since TNCC is not well-suited to the ICU nurse, educational institutions and level I and II trauma hospitals should be encouraged to develop educational programs for nurses in level III and IV trauma hospitals that are guided by the six educational objectives in criteria or hospitals should be encouraged to explore the CALS program.
3. A pediatric-specific educational component is missing from many nursing educational offerings. Develop a mechanism to ensure that providers receive pediatric-specific trauma training.
4. There appears to be two weak links in the current trauma system nurse education requirements. First, for those who choose to provide their nurses with in-house education, there is no a curriculum standard or mechanism to demonstrate competency nor is there any system oversight of these courses. Second, there is no requirement for continuing trauma education after the initial training. Requiring a small number of trauma education hours periodically seems reasonable.

EMS Personnel

1. Require hospitals to demonstrate integration of trauma education, performance improvement and program initiatives with their local EMS providers.
2. Any recommendations to improve trauma training must be collaborative in nature. Include the EMS industry and medical directors in the development of any EMS training standard or program.
3. Requiring additional trauma training for EMS providers is likely to be poorly-received and may hinder volunteer recruitment and retention. Instead, recommend trauma training standards and develop and provide training modules for EMS medical directors to use at their discretion. These modules should be accessible via various methods. Ask the EMSRB Medical Director Standing Advisory Committee what the trauma training/educational needs are. Generally, provide resource and allow for local decision-making rather than establishing specific training requirements.
4. Encourage high-volume ambulance services (particularly those associated with level I and II trauma centers) to develop a ride-along program for rural EMS providers in order to increase rural EMS providers' exposure to trauma cases.

Task #5: Address and make recommendations regarding increasing both the number of ATLS and CALS courses offered throughout the state and the instructor pools for both.

Current Status

ATLS utilizes the TraumaMan training mannequin to teach essential trauma skills. CALS will soon use it for their trauma skills module. In an effort to offset the cost of providing this training, the trauma system has purchased five of these mannequins for use by both courses. It is estimated that the mannequin loaner program reduced the cost of providing ATLS by approximately \$50,000 in 2008.

CALS

Since the inception of the trauma system, CALS has seen a 40 percent increase in the number of provider courses to approximately 25 in the last year. The Benchmark Labs were provided approximately 65 times instead of the expected 45. Since the cost to the student is significantly offset by grant dollars, this has resulted in a funding short fall. Even the increased number of course offerings was inadequate to meet the demand. Last year CALS operated in the red.

The CALS program is developing a new trauma skills module that would incorporate the system-required trauma skills into a mobile mannequin lab, thus eliminating the requirement for providers to complete the Benchmark Lab. This module would be added to the Provider Course upon demand and will be available as a stand-alone, skills-only module that can be taken on the road. Beta testing on the new trauma module will be completed by the end of February 2009 and will likely be ready for deployment in March. While a promising endeavor, the cost of this module is expected to further increase financial demands on the CALS program.

The instructor pool remains adequate. Instructor courses continue to be offered annually.

ATLS

There are 20-25 student courses offered annually. Most are filled to their capacity of 16. Some course venues make a very limited number of spots (one or two) available for audit by mid-level practitioners. However, only physicians may become certified as ATLS providers.

Currently, ATLS is offered only at metropolitan venues. As a result, many rural providers are away from their practice for two or three days and must travel some distance to participate. However, the Minnesota ACS COT is planning to take ATLS on the road. This new initiative will make ATLS more readily accessible to rural providers. The COT has successfully procured a grant to cover the startup cost of this program as well as some of the tuition. They plan to offer the course in rural locations 12 times over four years.

Most ATLS course sites report challenges in securing an adequate instructor pool.

Recommendation

1. Pursue opportunities to support funding initiatives for both CALS and ATLS.
2. Work collaboratively with the Minnesota ACS COT to identify potential training sites for the ATLS on-the-road initiative and to support and promote the courses.
3. Encourage the CALS program to collaborate with Minnesota ACS COT on the development of the CALS trauma module and on scheduling of the courses to prevent overlap. Both organizations stand to benefit from an awareness of each others' operations.

Acronyms

ACS	American College of Surgeons
ATCN	Advanced Trauma Care for Nurses
ATLS	Advanced Trauma Life Support
BTLS	Basic Trauma Life Support
CALS	Comprehensive Advanced Life Support
CATN	Course in Advanced Trauma Nursing
COT	Committee on Trauma
DOT	Department of Transportation
EMS	Emergency Medical Services
EMSC	Emergency Medical Services for Children
EMSRB	Emergency Medical Services Regulatory Board
EMT-P	Emergency Medical Technician-Paramedic
ENA	Emergency Nurses Association
ICU	Intensive Care Unit
PHTLS	Prehospital Trauma Life Support
RTAC	Regional Trauma Advisory Committee
STAC	State Trauma Advisory Council
TNCC	Trauma Nursing Core Course