Advanced Trauma Life Support

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Advanced Trauma Life Support (ATLS) is a training program for doctors and Advanced Practice/Critical Care Paramedics in the management of acute trauma cases, developed by the American College of Surgeons. The program has been adopted worldwide in over 40 countries,[1] sometimes under the name of Early Management of Severe Trauma (EMST), especially outside North America. Its goal is to teach a simplified and standardized approach to trauma patients. Originally designed for emergency situations where only one doctor and one nurse are present, ATLS is now widely accepted as the standard of care for initial assessment and treatment in trauma centers. The premise of the ATLS program is to treat the greatest threat to life first. It also advocates that the lack of a definitive diagnosis and a detailed history should not slow the application of indicated treatment for life-threatening injury, with the most time-critical interventions performed early. However, there is mixed evidence to show that ATLS improves patient outcomes.[2][3][4][5][6]

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Primary Survey

The first and key part of the assessment of patients presenting with trauma is called the primary survey. During this time, life-threatening injuries are identified and simultaneously resuscitation is begun. A simple mnemonic, ABCDE, is used as a memory aid for the order in which problems should be addressed.

A Airway Maintenance with Cervical Spine Protection
B Breathing and Ventilation
C Circulation with Hemorrhage Control
D Disability (Neurologic Evaluation)
E Exposure and Environment

A - Airway Management

Assess the airway. If the patient is able to talk, the airway is likely to be clear. If the patient is unconscious, he/she may not be able to maintain his/her own airway. The airway can be opened using a chin lift or jaw thrust. Airway adjuncts may be required. If the airway is blocked (e.g., by blood or vomit), the fluid must be cleaned out of the patient’s mouth.

B - Breathing and Ventilation

The chest must be examined by inspection, palpation, percussion and auscultation. Subcutaneous emphysema and tracheal deviation must be identified if present. Life-threatening chest injuries, including tension pneumothorax, open pneumothorax, flail chest and massive hemithorax must be identified and rapidly treated. Flail chest, penetrating injuries and bruising can be recognised by inspection.

C - Circulation with Hemorrhage Control

Hemorrhage is the predominant cause of preventable post-injury deaths. Hypotension following injury must be assumed to be due to blood loss until proven otherwise. Hypovolemic shock is caused by significant blood loss. Two large-bore intravenous lines are established and crystalloid solution given. If the patient does not respond to this, type-specific blood, or O-negative if this is not available, should be given. External bleeding is controlled by direct pressure. Occult blood loss may be into the chest, abdomen, pelvis or from the long bones. Chest or pelvic bleeding may be identified on X-ray. Bleeding into the peritoneum may be diagnosed on ultrasound (FAST scan), CT (if stable) or diagnostic peritoneal lavage.
D - Disability (Neurologic Evaluation)

During the primary survey a basic neurological assessment is made, known by the mnemonic AVPU (alert, verbal stimuli response, painful stimuli response, or unresponsive). A more detailed and rapid neurological evaluation is performed at the end of the primary survey. This establishes the patient’s level of consciousness, pupil size and reaction, lateralizing signs, and spinal cord injury level.

The Glasgow Coma Scale is a quick method to determine the level of consciousness, and is predictive of patient outcome. If not done in the primary survey, it should be performed as part of the more detailed neurologic examination in the secondary survey. An altered level of consciousness indicates the need for immediate reevaluation of the patient's oxygenation, ventilation, and perfusion status. Hypoglycemia and drugs, including alcohol, may influence the level of consciousness. If these are excluded, changes in the level of consciousness should be considered to be due to traumatic brain injury until proven otherwise.

E - Exposure / Environmental control

The patient should be completely undressed, usually by cutting off the garments. It is imperative to cover the patient with warm blankets to prevent hypothermia in the emergency department. Intravenous fluids should be warmed and a warm environment maintained. Patient privacy should be maintained by closing curtains.

Secondary Survey

When the primary survey is completed, resuscitation efforts are well established, and the vital signs are normalizing, the secondary survey can begin.

The secondary survey is a head-to-toe evaluation of the trauma patient, including a complete history and physical examination, including the reassessment of all vital signs. Each region of the body must be fully examined. X-rays indicated by examination are obtained.

If at any time during the secondary survey the patient deteriorates, another primary survey is carried out as a potential life threat may be present.

The person should be removed from the hard spine board and placed on a firm mattress as soon as reasonably feasible as the spine board can rapidly cause skin breakdown and pain while a firm mattress provides equivalent stability for potential spinal fractures.[7]

Alternatives to ATLS

Anaesthesia Trauma and Critical Care (ATACC) is an international trauma course based in the United Kingdom. It is an advanced trauma course and represents the next level for trauma care and trauma patient management post ATLS certification. Accredited by two Royal Colleges and numerous emergency services, the course runs numerous times per year for candidates drawn from all areas of medicine and trauma care. [8]

History

ATLS has its origins in the United States in 1976, when orthopaedic surgeon Dr. James K. Styner, piloting a light aircraft, crashed his plane into a field in Nebraska. His wife was killed instantly and three of his four children sustained critical injuries. He carried out the initial triage of his children at the crash site. Dr. Styner had to flag down a car to transport him to the nearest hospital; upon arrival, he found it closed. Even once the hospital was opened and a doctor called in, he found that the emergency care provided at the small regional hospital where they were treated was inadequate and inappropriate.[9]

Upon returning to work, he set about developing a system for saving lives in medical trauma situations. Styner and his colleague Paul ‘Skip’ Collicott, with assistance from Advanced Cardiac Life Support personnel and the Lincoln Medical Education Foundation, produced the initial ATLS course which was held in 1978. In 1980, the American College of Surgeons Committee on Trauma adopted ATLS and began US and international dissemination of the course. Styner himself recently recertified as an ATLS instructor, teaching his Instructor Candidate course in the UK and then in the Netherlands.

Since its inception, ATLS has become the standard for trauma care in American emergency departments and advanced paramedical services. Since emergency physicians, paramedics and other advanced practitioners use ATLS as their model for trauma care it makes sense that programs for other providers caring for trauma would be designed to interface well with ATLS. The Society of Trauma Nurses has developed the Advanced Trauma Care for Nurses (ATCN) course for Registered Nurses. ATCN meets concurrently with ATLS and shares some of the lecture portions. This approach allows for medical and nursing care to be well coordinated with one another as both the medical and nursing care providers have been trained in essentially the same model of care. Similarly, the National Association of Emergency Medical Technicians has developed the Prehospital Trauma Life Support (PHTLS) course for basic Emergency Medical Technicians (EMTs). This course is based around ATLS and allows the PHTLS-trained EMs to work alongside paramedics and to transition smoothly into the care provided by the ATLS and ATCN-trained providers in the hospital.

See also

- Trauma team
- Basic Life Support
- Advanced Life Support
- Advanced Cardiac Life Support
Pediatric Advanced Life Support
Definitive Surgical Trauma Skills
ABC (medicine)
List of emergency medicine courses

References
1. a ^ Bouillon, B., Kanz, K.G., Lackner, C.K., Mutschler, W., & Sturm, J. The importance of Advanced Trauma Life Support (ATLS) in the emergency room [Article in German]. Unfallchirurg. 107(10), 844-850.
7. ^ Amal Mattu; Deepi Goyal; Barrett, Jeffrey W.; Joshua Broder; DeAngelis, Michael; Peter Deblieux; Gus M. Garmel; Richard Harrigan; David Karas; Anita L. Italian; David Manthey (2007). Emergency medicine: avoiding the pitfalls and improving the outcomes. Malden, Mass: Blackwell Pub./BMJ Books. pp. 60. ISBN 1-4051-4166-2.
8. ^ Anaesthesia Trauma and Critical Care (http://www.atacc.net)

Further reading

External links
Advanced Trauma Care for Nurses (http://www.traumanurses.org/education/atcn)
Definitive Surgical Trauma Skills (http://www.rcseng.ac.uk/education/courses/surgical_truma.html)
About ATLS (http://www.facs.org/trauma/atls/about.html)

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