INTRODUCTION

The ATLS® course presents an organized and systematic approach for evaluation and treatment, promotes standards of care, and recognizes injury as a global healthcare challenge. The typical ATLS® learner is beginning a journey in emergency trauma care, frequently serving as a clinician outside of a Level 1 Trauma Center. However, clinicians practicing in an advanced center will continue to benefit from the knowledge and skills transmitted in ATLS®.

The 11th edition revision process maintained the global participation and positive direction of prior versions. Every aspect of the Course was reviewed and revised, including the manual, interactive discussion materials, skills stations curricula, Hybrid Course modules, video resources, initial assessment stations, multiple choice test questions, MyATLS® app content, and policies. All aspects were recreated to meet the needs of the ATLS® learner and to adhere to the best medical and educational evidence available while maintaining the demonstrated effective and popular Course structure.

This document contains an overview, not an exhaustive list, of changes in the Course from the 10th to 11th editions. It is designed to assist experienced ATLS® coordinators, instructors, directors, and educators in understanding the major organizational, instructional, content, and skills modifications embedded in the 11th edition.

CONTENT REORGANIZATION

1. Modification of the ATLS® mnemonic from ABCDE to xABCDE is the 11th Edition's most fundamental change. "Treat the greatest threat to life first" remains the central tenet of ATLS®. For certain patients, rapid control of exsanguinating external hemorrhage is lifesaving. Military and civilian research has validated application of this approach in appropriate clinical contexts. Therefore, the letter "x" was added at the beginning of the mnemonic.

2. A second fundamental change is in Course organization. Following thorough review, twenty-four content areas were identified. For the manual, these areas were organized into three sections: *Evaluation, Management, and Resuscitation of the Injured Patient*; *Trauma Systems and Patient Centered Care*; and *Specific Injuries and Injury Patterns - Special Considerations*.

3. The appendices were removed.

4. The 10th edition introduced an ABCDE structure for skills stations. The 11th edition expands the xABCDE structure to the manual, interactive discussions and Hybrid Course modules.

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5. Content in the 10th edition Initial Assessment and Management chapter was expanded, clarified, and divided into Initial Assessment: Primary Survey and Initial Assessment: Secondary Survey chapters.

6. Most subjects discussed in the 10th edition Thoracic Trauma chapter are included in the new Breathing and Ventilation Assessment and Management chapter with others transitioned to a new Thoracic, Abdominal and Genitourinary Trauma chapter.

7. Content from the 10th edition Shock chapter is presented and expanded in Circulation Assessment and Volume Resuscitation.

8. The 10th edition topics of Head Trauma and Spine and Spinal Cord Trauma are addressed in a combined Disability: Neurological Assessment and Management chapter.

9. Exposure and Environmental Threats in the Primary Survey moves the subjects of Hypothermia and Heat Injuries from the appendices.

10. The critical importance of team dynamics and communication is recognized with relocation from the ATLS and Trauma Team Resource Management 10th edition appendix to an expanded Section I chapter titled Resuscitation Team Function and Communication.

11. Geriatric Trauma is renamed Trauma in the Older Patient and expanded to reflect the increasing importance of injury and frailty in this vulnerable population.

12. Skills stations are organized as slide sets for coordinators and instructors to facilitate equipment organization and scenario-based learning.

13. New instructor notes for each skills station. These may be printed for instructors to use.

NEW CONTENT AREAS

The field of traumatology has expanded markedly since the inception of ATLS®. Although new content was added to the Course, an increase in length with resultant cognitive overload was avoided by attention to objectives, integration of concepts, and creation of new pre-course instructional materials.

1. Specific adaptations of Initial Assessment in penetrating trauma scenarios are discussed in *Penetrating Trauma* for the clinician who desires more education on this mechanism.

2. Important *Thoracic, Abdominal and Genitourinary Trauma* topics that were not discussed in the Initial Assessment material are reviewed in an expanded chapter.

3. Injury care extends beyond the boundaries of medical facilities and beyond physical interventions. The new *Injury Prevention* and *Trauma Systems* chapters explain how opportunities for injury prevention and trauma system development may be recognized at the time of initial assessment. Hybrid Course modules were created for both topics.

4. The topics of *Trauma Informed Care and Social Determinants of Health* are added to provide practical material on an approach to communication that recognizes individual patient dignity and leads to optimal outcomes.

5. Communication to patient's family can be challenging for a clinician. Expanded and rewritten from the 10th edition ATLS and Trauma Team Resource Management appendix, a complete chapter with instruction on *Communicating Serious News in the Acute Care Setting* is an 11th Edition addition.

6. To avoid increasing in-person course time, several new videos illustrating these concepts were created as pre-course elements.

WEAVE AND FLEX CONCEPTS

Even an introductory presentation of each topic applicable to acute trauma management would overwhelmingly increase ATLS® course length. Therefore, many topics are wrapped as a question within the discussion of an injured patient. These topics are incorporated as they occur in clinical practice. ATLS® refers to this integration of physical, communication, holistic, prevention, systems, and other aspects of clinical interaction as the weave concept. Figure 1 illustrates the weave concept.



Figure 1 Content Weave During interactive discussions, Hybrid Course modules, skill station scenario discussions and other aspects of the ATLS® Course, the concepts of xABCDE (x, control of external exsanguinating hemorrhage; A, Airway; B, Breathing; C, Circulation; D, Disability; E, Exposure and environment) are reinforced and topics of trauma systems, communicating serious news and goals of care, injury prevention, humanization (patient-centered care), disaster events, cultural appropriateness, teamwork and flexible options in practice environments are presented within a clinical story.

ATLS® clinicians' function in a wide variety of practice environments. Some facilities have seemingly unlimited continuous access to personnel, blood products, specialty care, and advanced technology. Access within other facilities is limited or never available. Various agencies regulate medical practices. In recognition of these variations in practice settings and resources, the Flex concept was developed to apply ATLS® principles to a wider variety of practice environments. Flex represents standardized flexibility and adaptability of Course content. With Flex, instructors and learners determine the optimal practical application of ATLS® material to their specific practice environment.

ATLS® learners are members of global cultures and lifestyles. For effective transfer of the life-saving knowledge, skills, and attitudes of ATLS®, every learner must be able to visualize themselves as an accepted member of the Course. Therefore, materials were chosen as best as possible for application across diverse cultures and to avoid inadvertent exclusion of any ATLS® learner.

INSTRUCTIONAL CHANGES

Pretest

A new 40 question pretest has been created. Completion is required prior to attending the in-person Course. Currently, information technology hurdles remain that prevent reporting of pretest results to individual sites. Returning the reporting function remains a high priority.

Motor Skills Instruction

For a novice learner, optimal motor skill acquisition occurs when the new technique is introduced in a stepwise or phased fashion. Separate presentation of cognitive, visual, and auditory components isolates learner focus and facilitates construction of accurate mental models. The 11th edition ATLS Instructor Course defines the steps as know (discuss anatomy, equipment, indications, etc.), see (observe the skill), hear (listen to an explanation), say (recite the steps), do (practice the skill), and review (receive feedback and correction).

Recognizing the challenge in performing all steps for every ATLS skill in the compressed timeframe of the Course and responding to instructor feedback, the 11th edition introduces several modifications.

1. Skills are defined as Cognitive or Psychomotor. Acquisition of cognitive skills is not enhanced by stepwise instruction. Therefore, stepwise instruction is not used for these skills.

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2. ATLS learners frequently have experience with several procedures, frequently basic airway maneuvers, and the full stepwise model does not need to be employed in these instances. The instructor notes in the Skills Station slides state the procedures where stepwise instruction is performed.

3. Placement of a pelvic compression / binder device is both a team and psychomotor activity. Instructors are encouraged to have learners practice team function during this procedure.

4. To facilitate time management and improve opportunities for practice, the phase shift concept was developed. Mandatory 11th edition pre-course videos shift completion of the know, see, and say phases to before the in-person portion of the Course. The instructor notes in the Skills Station slides describe where the know, see, and say phases have been completed pre-course.

5. As pre-course video review accomplishes the know, see, and hear steps, in-person Skills Station instruction may start at the say step by facilitating the learners (individually or as a group) to narrate the procedure while the instructor either performs a live demonstration or shows selected portions of the video (with the sound off). Subsequently, each learner practices the skill (do), with other learners narrating (say) if they have not yet accomplished this step. The instructor provides feedback (review).

Videos

The current **required videos** (with length in min:sec) are:

1. Initial Assessment: Primary Survey (26:34)
2. Resuscitation Team Function and Communication (10:28)
3. Stop the Bleed: Tourniquet Application (00:57)
4. Bag-Valve Mask Ventilation – One-person and Two-person (02:39)
5. Endotracheal Intubation (02:38)
6. LMA Insertion (00:53)
7. Surgical / Incisional Airway (10:01)
8. Finger and Tube Thoracostomy (09:19)
9. Intraosseous Device Insertion (03:57)
10. Pelvic Stabilization (05:48)
11. Initial Assessment: Secondary Survey (15:56)

The **optional videos** are:

1. Communicating Serious News (08:34)
2. Basic Interpretation of CXR, Pelvis X-ray, and FAST (19:14)
3. Ocular Trauma, cantholysis and eye shield (00:55)
4. Neurologic exam (02:57)
5. Surgical / Incisional Airway with cadaver model

Skills Stations Organization

Following recommendations from the coordinator's workgroup, skills stations are organized into eight one-hour blocks. Sites may modify the structure to fit local resources. Further content details are listed below in the Content Changes section. The skills stations blocks are:

1. Initial Assessment: Primary Survey and Pretest Review
2. Airway (basic, advanced, intubation and LMA options, basic pediatric airway)
3. Breathing and Surgical / Incisional Airway (combined as many sites use the same manikin)
4. Circulation (includes "x", tourniquet conversion, and pelvic binder devices)
5. Disability (one brain injury scenario and one spinal injury scenario)
6. Initial Assessment: Secondary Survey and Choice: Burn / Pregnancy / Ocular / Pediatric
7. Team Dynamics / Communication and Communicating Serious News
8. Triage / Disaster Preparedness and Adjuncts Choice

Assessment Changes

Three 40-question multiple choice tests are available for summative evaluation. Frequent psychometric analysis is being performed with question revision or replacement if indicated. U.S. and global sites are involved in test analysis.

The initial assessment evaluation scenarios have been rewritten and incorporated in the 11th edition content. New for this edition are Quick Reference guides that provide experienced instructors with easier access to scenario details and critical treatment decisions.

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Hybrid ATLS®

Hybrid ATLS® has been extremely successful since initial release. In many centers it is the primary format for ATLS® instruction. The 11th edition Hybrid Course is a complete re-imagination of on-line ATLS® learning while maintaining the current in-person course length. New interactive modules were created based on the interactive discussion materials to closely mimic an in-person course and provide an educationally equivalent experience. Module duration is more consistent. Multiple methods of interaction are used, employing current best practices in instructional design. Following standardized flexibility, optional modules were developed that deliver instruction on material in manual Sections II and III.

MyATLS® App

The MyATLS® mobile app is completely new. It was redesigned from new code with instructional design central for access to key ATLS® elements in real time. The app now provides access to chapter summaries, videos, step-by-step skill guides, medical calculators, checklists, quiz questions, flashcards, and interactive Case Scenarios. New content will be added, and existing content updated frequently. The MyATLS® app can be found in the Apple Store and Google Play by searching for "ACS MyATLS." For additional information visit www.facs.org/myatls.

CONTENT CHANGES

1 - Initial Assessment: Primary Survey

CONTENT

1. The field triage table is updated to reflect the 2021 National Guideline for the Field Triage of Injured Patients which was created based on recommendations of the National Expert Panel on Field Triage. These criteria include Red and Yellow criteria as opposed to a series of steps.
2. The impact of a patient's prior healthcare and injury encounters on effective clinician-patient communication is introduced.
3. The importance of a structured prearrival huddle and prehospital handover are stressed. Modification of the handover in critical situations is discussed.
4. The Flex concept of resource appropriate care is introduced, recognizing that specific injuries, clinician training, resources, practice environments, geographic location, and a multitude of other factors may necessitate protocol modifications.
5. Primary survey adds evaluation and management of exsanguinating external hemorrhage as the first part in the xABCDE mnemonic.
6. A new Primary Survey summary table is included.

7. The concept of applying basic airway maneuvers while initiating volume resuscitation prior to administration of RSI medications to hypotensive patients is introduced.
8. Temporary adjunctive administration of a vasopressor to counter the effects of RSI medications is introduced.
9. Blood and blood products are preferred for primary resuscitation of hemorrhagic shock.
10. A new figure was created to illustrate potential sources of hemorrhage ("four and the floor" or "the floor and four more").
11. The use of certain adjuncts as part of the primary or the secondary survey is clarified.
12. Lactate levels can be used to monitor the progress of resuscitation.
13. The S-xABCDE-BAR acronym is introduced for structuring transfer communication.
14. A process for communicating serious news in the acute trauma setting is introduced with a new figure.
15. The 3E's of injury prevention are introduced: education, engineering / environment, and enforcement.

Skills

1. A 30-minute small group skills station (combined with pre-test review).
2. A new video was created to demonstrate the Primary Survey and xABCDE's.

2 - Resuscitation Team Function and Communication

Content

1. Trauma resuscitation is one of the most challenging processes in healthcare. Team situational awareness and exceptional communication are required to prevent adverse events. Effective communication is needed within the care team, to the patient and family members, and during transfer.
2. Key concepts:
   a. Leadership and followership
   b. Attention and (situational) awareness, illustrated with a new table
   c. Verbal communication
   d. Decision-making
   e. Task management and coordination
3. Detailed information is provided to improve communication in six phases of care: preplanning, prearrival huddle, arrival handover, initial assessment, departure handover, and event debrief.
4. A "time out / all quiet" initiates arrival handovers.
5. The IMIST-AMBO tool is summarized in a new figure.

   Identify
   Mechanism

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Injuries
Signs
Treatment
Allergies
Medications
Background
Other information

6. The three "C's" (cite names, clarity of instructions, and closed loop communication) and the CUS graded assertiveness tool (concerned, uncomfortable, safety issue) for communication discussed and presented in new tables.
7. Example checklists / toolkits for intubation, departure handover, and evaluation of the pregnant trauma patient are presented.
8. The TAKE STOCK debrief tool is explained.

Take an instruction sheet
Ask "Is everyone OK?"
Know if anyone needs a break
Equipment issues?
Summarize the event
Things that went well?
Opportunities to learn?
Cold debrief necessary?
Know who is present.

Skills

1. Choose either a blunt or penetrating trauma scenario for a 30 – 35-minute skills station
2. Pre-arrival huddle
3. Arrival and departure handover (I-MIST-AMBO)
4. Graded assertiveness
5. Situational awareness and closed-loop communication

3 - The x: Control of eXsanguinating eXternal Hemorrhage

Content

1. Control of exsanguinating hemorrhage is addressed as a separate topic.

Skills

1. Practice of direct pressure and wound packing is available in the Circulation Skills Station.
2. Tourniquet application and conversion are combined with the Circulation section skills.

4 - Airway Assessment and Management

Content

1. Airway management is presented as a spectrum of basic to advanced interventions.
2. The safest airway management is achieved through individual and team training.
3. As opposed to use in elective operations, in trauma situations every airway should be considered potentially difficult. Various systems (e.g. LEMON, Mallampati, MACOCHA) are either impossible to perform or have not been validated in trauma patients.
4. The most experienced airway clinician is involved in airway management decisions and procedures.
5. Jaw thrust is preferred. Chin lift removed.
6. Figures illustrating capnography waveforms and high flow nasal cannula were added.
7. Pre- and post-intubation checklists are valuable to improve care.
8. Always plan for failure, have a back-up plan for management, and make the first attempt the best attempt at intubation.
9. The term “Rapid Sequence Intubation” (RSI) has been refined and references the rapidity of medication effects as opposed to rapidity of the procedure.
10. The RSI technique is preferred for trauma scenarios.
11. Volume resuscitation should be initiated prior to administration of RSI medications, particularly in shock scenarios.
12. Bolus dosing of vasopressors may be indicated to treat RSI medication-induced hypotension.
13. Video laryngoscopes are optimal for trauma intubations.
14. Pre-oxygenation should be performed when time allows.
15. The patient should be informed of procedures even if appearing unconscious.
16. Apneic oxygenation should be used during laryngoscopy.
17. After three intubation attempts, a change in technique or operator is recommended. BVM ventilation is performed between attempts.
18. Sustained ETCO2 detection remains the best practical indicator of successful endotracheal intubation.
19. Sustained ETCO2 detection is defined as CO2 detected on at least seven breaths.
20. A return to basic airway maneuvers and BVM ventilation may be safer than continued attempts at advanced procedures if adequate oxygenation and ventilation can be obtained with BVM ventilation.
21. A “surgical” airway may also be known as an “incisional” airway.
22. New illustrations of a surgical airway were created.
23. Surgical / incisional airway is indicated for “Can’t intubate, Can’t oxygenate” or “Can’t intubate, Can’t ventilate” situations.

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24. Once a surgical airway is indicated (can't intubate), the procedure must be completed despite challenges.
25. Needle cricothyroidotomy is recommended only for younger children / infants and is a skills station discussion. A surgical / incisional airway is preferred.

Skills

1. One-hour Skills Station with two options available for different sites and practice environments. The difference in the options is whether endotracheal intubation or LMA is the focus of practice.
2. Practice of basic airway management prior to advanced techniques.
3. Pediatric airway management combined in airway station.
4. Surgical (incisional airway) and needle airway (optional) skills are combined with Breathing Skills Station.

5 - Breathing and Ventilation Assessment and Management

Content

1. New chapter focusing on immediately and early life-threatening disorders and management.
2. Many new images, illustrations, and tables.
3. Further support for axillary site for emergency needle thoracostomy.
4. The importance of pain management in chest wall injury is emphasized.

Skills

1. One hour skills station that includes thoracostomy (finger and tube), surgical (incisional airway), and needle cricothyroidotomy (pediatric model).
2. Thoracic image interpretation may be performed either with the Breathing or the Adjuncts Skills Stations (combined with Triage and Disaster Preparedness as one station).

6 - Circulation Assessment and Volume Resuscitation

Content

1. New chapter containing most topics in the 10th edition Shock chapter.
2. New table describing classification of nonhemorrhagic shock into obstructive, cardiac, and distributive types.

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3. Table of signs and symptoms related to classes I to IV of hemorrhagic shock has been replaced. New table relates clinical parameters to degrees of hemorrhage severity on a spectrum from mild to major and includes response to resuscitation and operative hemorrhage control categories. In the table, Glascow Coma Scale score has been changed to Level of Consciousness.
4. Specific percentages of blood loss related to the classes of hemorrhage has been removed.
5. Shock Index (SI) and ETCO2 monitoring are discussed.
6. A new figure was created to illustrate potential sources of hemorrhage ("four and the floor" or "the floor and four more").
7. Blunt cardiac injury is more fully discussed in this chapter.
8. New table Clinical Factors Associated with a Pelvic Fracture.
9. Multiple new figures illustrating changes in pelvic volume and application of pelvic compression.
10. New figure illustrating Poiseuille's law.
11. New figures illustrating interosseous insertion.
12. Red cells and other blood products, including whole blood, are the ideal resuscitative fluids for hemorrhagic shock.
13. New table Clinical Abnormalities in Shock and Signs of Improved Perfusion.
14. New table Reasons for Nonresponse to Resuscitation.
15. New table summarizes Factors Associated with Variable Response to Resuscitation for pregnant, older adult, pediatric, and athletic patients.
16. Support for administration of tranexamic acid (TXA) in major hemorrhagic shock.
17. New figure illustrating mechanism of action for TXA.
18. Expanded table for Recommended Options for Reversal of Effects of Anticlotting Medications.
19. Autotransfusion is not discussed.
20. Discussion of traumatic cardiac arrest management and termination of resuscitation.

Skills

1. One hour Hemorrhage Control (Internal and External), Circulation Assessment, and Volume Resuscitation skills station with two cases to complete.
2. Application of pelvic binder / sheet and tourniquet.
3. Added tourniquet conversion discussion.
4. Insertion of interosseous device.
5. Optional insertion of rapid infusion catheter (RIC) and / or central venous catheter (CVC).
6. Optional demonstration/practice of FAST and eFAST.
7. Optional discussion of diagnostic peritoneal lavage.

7 - Disability and Neurological Assessment and Management

Content

1. Combined brain and spinal cord trauma chapter.
2. Large amount of anatomy discussion removed.
3. Many new figures, images, and tables.
4. Added cerebral autoregulation curve.
5. Fixed Monroe-Kellie figure.
6. New table regarding indications for spinal motion restriction following high energy blunt mechanisms.
7. Expanded screening criteria for blunt cerebrovascular injury.
8. Blood pressure goals for TBI and SCI management (Adults SBP ≥ 100 TBI, MAP > 90 SCI).
9. Combined effect of hypotension and hypoxia increases the risk of death by two-fold in TBI.
10. New term: critical neuroworsening. Describes a rapid deterioration of neurologic status that warrants emergent evaluation. The clinical signs are a spontaneous decrease in the GCS motor score, new decrease in pupillary reactivity, new pupillary asymmetry, bilateral dilated pupils, new focal motor deficit, and Cushing's triad (widened pulse pressure, bradycardia, and irregular respiration).
11. Stepwise management of neuroworsening:
12. Intubation, controlled ventilation
13. HOB 30-45° with neutral spine position
14. Loosen cervical collar if too snug
15. Transient hyperventilation to PaCO2 30-35
16. Optimize analgesia and sedation
17. IV bolus hyperosmolar agent
18. Normothermia
19. Early spinal decompression and stabilization may result in improved functional recovery, particularly when partial injuries are present.
20. Post-traumatic seizure prophylaxis recommended following severe (GCS score ≤ 8) and penetrating TBI.

Skills

1. TBI assessment, GCS score evaluation, and interpretation of CT scans.
2. Management of TBI and neuroworsening.
3. Detailed neurologic examination.
4. Presentation of "column based" method for evaluating spinal imaging.

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8 - Exposure and Environmental Threats in the Primary Survey

Content

1. The "E" component of the primary survey has two major goals: (1) to fully expose and inspect the patient for externally visible injuries; and (2) to identify and begin treatment for any life-threatening environmental emergencies.
2. Systemic hypothermia is a common problem in patients with hemorrhagic shock.
3. Fluid resuscitation for major burn injury (likely ≥ 20%) starts prior to final calculation of TBSA with LR at: 500 mL/hr for age ≥ 13 years; 250 mL/hr for ages 6-12 years; and 125 mL/hr for ages ≤ 5 years.

Skills

1. Part of secondary survey skills training.

9 - Thermal Injuries

Content

1. Volume resuscitation for burn injury is age-based and follows American Burn Association recommendations.
2. Calculations are over 16 hours, not 8.
3. Fluid calculations are not adjusted for time of injury or for volume administered prior to calculation.
4. Fluid rates are adjusted hourly based on urine output. Bolus fluid administration is avoided except temporarily during management of hypotension. If hypotension is present, evaluation for a non-burn injury etiology is performed.
5. Initial fluid calculation for adults is 2 mL/hr / kg / %TBSA.
6. Initial fluid calculation for all electrical injuries is 4 mL / kg / %TBSA.
7. Discuss potential thrombolytic therapy for acute frostbite with a regional referral center.
8. Demarcation of extent of cold injury may take weeks to months.

Skills

1. Elective option in block with secondary survey skills training.

10 - Musculoskeletal Injuries

Content

1. Added injured extremity index.
2. Added Gustilo-Anderson open fracture classification in antibiotic guidelines. Type 1 is a clean wound with < 1cm of length and type III is heavily contaminated with significant soft tissue damage and vascular injury.
3. Obtain x-rays of entire bone at injury site. Include joints proximal and distal.

Skills

1. Part of secondary survey skills training.

11 - Trauma in the Pediatric Patient

Content

1. No changes from 10th.
2. Blood product resuscitation recommended for hemorrhagic shock at 10 mL / kg.
3. Recommendations for pediatric equipment by age included.
4. Continue to recommend infant RSI pretreatment with atropine.
5. Surgical cricothyroidotomy continues to be discouraged for infants and younger children.
6. Needle airways do not provide adequate ventilation but may provide short term oxygenation.

Skills

1. Elective option in block with secondary survey skills training.

12 - Trauma in the Older Adult

Content

1. Added frailty index.
2. Expanded discussion of elder abuse and perpetrators.
3. Discussion of ageism as bias against individuals based on age.

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13 - Trauma in the Pregnant Patient

Content

1. CODE focused obstetrical history:

   Complications
   Obstetric history and prenatal provider
   Dating method and estimated due date
   Event details including leaking, bleeding, contractions, and fetal movement
2. Maternal Fetal Trauma Checklist provided.
3. The gravid uterus can cause IVC (inferior vena cava) compression in the supine position as early as 18 weeks of gestation. This can decrease cardiac output as much as 30%. Left uterine displacement is an important adjunct to the primary survey.
4. Placental abruption is a clinical diagnosis and may occur after any degree of injury. Most abruptions are detected within 6 hours but they can occur up to 24 hours after injury.
5. Triad for abruption: contractions, bleeding, and abdominal pain. Uterine contractions are most sensitive sign.
6. Consult obstetrics for recommendations regarding monitoring.
7. All Rh-negative pregnant patients should receive immunoglobulin within 72 hrs.
8. The term resuscitative cesarean delivery replaces perimortem cesarean delivery and is considered during maternal cardiac arrest if uterus is at or above the level of the umbilicus and spontaneous circulation does not return after 5 minutes of appropriate resuscitation, regardless of fetal cardiac activity. Early and rapid uterine evacuation (even if fetus nonviable) may have > 50% probability of maternal ROSC.

Skills

1. Elective option in block with secondary survey skills training.

14 - Initial Assessment: Secondary Survey

Content

1. Content moved from the 10th edition Initial Assessment and Management chapter to this new chapter.
2. Added tourniquet conversion.

Skills

1. Core scenario (30 min): secondary survey exam, splinting extremity, and diagnosis of compartment syndrome.
2. One (or more) elective scenario (30 min): Burn Injuries, Trauma in Pregnancy, Ocular Trauma, or Pediatrics and Injury Prevention.

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15 - Transfer to Definitive Care

Content

1. An updated transfer communication mnemonic of S-xABCDE-BAR is introduced.

   Situation
   xABCDE
   Background
   Assessment
   Recommendations
2. A checklist is provided.

Skills

1. Part of communication skills station.

16 - Trauma Systems

Content

1. Trauma Systems is an entirely new chapter.
2. A trauma system is an organized, coordinated effort in a defined geographic area that delivers the full range of care to all injured patients and is integrated with the local public health system.
3. Regionalized trauma systems should have a process for triaging patients, ensuring that a patient gets to the level of trauma care that matches their injury severity and resulting in improved outcomes.
4. A trauma system includes key elements: injury surveillance and prevention, emergency medical services, prehospital care and transportation, acute hospital care, rehabilitation, and research activities.

17 - Triage and Disaster Management

Content

1. Moved from appendices.
2. Concepts of mass triage.
3. Incident command systems reinforced.

Skills

1. New skills station with brief interactive discussion session.
2. In the same teaching block as Adjuncts Skills Station.

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3. Two scenario options: multiple MVC incident at a hospital with surgical capabilities, and mass shooting incident at a hospital without surgical capabilities.

18 - Injury Prevention

Content

1. Trauma is NOT an accident
2. Most injuries are preventable
3. Prevention efforts have been successful.
4. Specifics of prevention varies by local social drivers / determinants of health and injury.
5. The 3 E's: Education, Engineering / Environment, Enforcement.
6. Screening tools provided to identify individuals at risk

19 - Trauma Informed Care and Social Determinants of Health

Content

1. New chapter and optional video.
2. Traumatic stress affects people differently. Patients and healthcare workers are at risk for developing psychological injury from the trauma care experience.
3. A trauma-informed healthcare system works to mitigate injury for all parties involved.
4. TIC involves the four Rs: Realizing the widespread impact of trauma; Recognizing the signs and symptoms of trauma; creating a system that can Respond to trauma; and avoiding Retraumatization.
5. Trauma-informed communication demonstrates compassion and empathy for patients, families, and colleagues while avoiding preconceived judgements and sarcastic comments.

20 - Communicating Serious News in the Acute Trauma Setting

Content

1. New chapter and video.
2. Preparation is critical. Gather personnel and select location.
3. Warning – "I have serious news to share …"
4. Headline – facts and meaning.
5. ABCDE – Ask what they know, Begin with warning, Concise summary (headline), Do allow for silence, Elicit questions/End encounter.

6. Debrief with team. Share details of meeting.

Skills

1. New skills station in same block as Team Dynamics and Communication.

21 - Thoracic, Abdominal and Genitourinary Trauma

Content

1. Reorganized content.
2. Critical diagnoses not addressed during xABCDE.
3. Blunt aortic injury grading and non-operative management discussed.
4. Pneumomediastinum and esophageal injuries discussed.

22 - Penetrating Trauma

Content

1. New chapter
2. Careful exam for injuries, diagram wounds
3. Do not remove impaled objects in the Emergency Ward
4. Zones of neck described relative to potential injured structures, not as indications for OR.
5. ABC (assessment of blood consumption) score ≥ 2 for activation of MTP/MHP.
6. Early transfer recommended.

23 - Ocular Trauma

Content

1. Lateral canthotomy and cantholysis detailed descriptions and illustrations added.
2. New ocular trauma flowsheet, prioritized by time.

Skills

1. Elective option in block with secondary survey skills training.

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24 - Injury in Combat Zones and Austere Environments

Content

1. Added tourniquet pitfalls and mitigations table.
2. Tourniquets should be reassessed for replacement or conversion at the earliest opportunity.
3. ATLS Operational Environment remains a useful concept.

Adjuncts Skills Station

Skills

Three skills station options:

1. Helmet removal with FAST image review (optional FAST training)
2. Imaging review with mini scenarios
3. Thoracic image review (if not performed with Breathing Skills station)

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