

Advanced Trauma Life Support (ATLS) Protocols in Indonesia: A Technical Guide to the 10th Edition Standards

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Trauma remains a leading cause of mortality and morbidity globally, particularly among the productive age population. In Indonesia, the management of traumatic injuries has undergone significant evolution, driven largely by the standardization provided by the **Advanced Trauma Life Support (ATLS)** program. Developed by the American College of Surgeons Committee on Trauma (ACS-COT) and disseminated in Indonesia through rigorous training programs, ATLS provides a systematic, concise approach to the care of the trauma patient. This article serves as an in-depth technical analysis of ATLS protocols, specifically focusing on the transition between the 9th and 10th editions, the clinical frameworks utilized in the Indonesian medical landscape, and the procedural execution required for life-saving interventions.

The Theoretical Framework of ATLS: The Golden Hour and the ABCDE Approach

The fundamental philosophy of ATLS is predicated on the concept of the **"Golden Hour"**—the critical window following a traumatic injury during which timely medical intervention significantly increases the probability of survival. The core of this methodology is the **Primary Survey**, a prioritized sequence of assessment and intervention designed to identify and treat the most immediate threats to life first. This is famously summarized by the mnemonic **ABCDE**: Airway, Breathing, Circulation, Disability, and Exposure.

Unlike traditional diagnostic approaches that seek a definitive diagnosis before treatment, the ATLS framework mandates that clinicians treat life-threatening conditions as they are identified. This is a shift from *diagnosis-based medicine* to *intervention-based emergency care*. In Indonesia, where pre-hospital care and transport times can vary significantly between urban centers like Jakarta and rural provinces, the adherence to these protocols is vital for optimizing patient outcomes.

The Evolution from 9th to 10th Edition

The transition from the **ATLS 9th Edition** (which was widely utilized in Indonesian training modules circa 2016) to the **10th Edition** brought about several critical updates based on evidence-based medicine and updated clinical trials. Key changes include a more nuanced approach to fluid resuscitation, the inclusion of the **Glasgow Coma Scale (GCS)** updated motor score components, and the integration of **Tranexamic Acid (TXA)** in the management of hemorrhagic shock.

Detailed Technical Analysis of the Primary Survey

The Primary Survey is not merely a checklist but a dynamic process that must be repeated whenever the patient's status deteriorates. Below is a technical breakdown of the individual components and the physiological principles underlying them.

1. Airway Management with Cervical Spine Protection

The priority is to ensure a patent airway. In the trauma setting, this must be done while assuming a cervical spine injury is present until proven otherwise. This necessitates the use of the **jaw-thrust maneuver** instead of the head-

tilt/chin-lift and the maintenance of **manual in-line stabilization (MILS)** during intubation. Technical considerations include:

- Assessment: Verbal response assessment (a speaking patient likely has a patent airway).
- Intervention: Suctioning of secretions, removal of foreign bodies, and insertion of an oropharyngeal or nasopharyngeal airway.
- Definitive Airway: Indicators for endotracheal intubation include GCS "d 8, severe maxillofacial fractures, or signs of impending airway obstruction (e.g., inhalation injury).

2. Breathing and Ventilation

Airway patency does not guarantee adequate ventilation. Clinicians must assess the lungs, chest wall, and diaphragm. Key pathologies to identify include **Tension Pneumothorax**, **Open Pneumothorax**, and **Massive Hemothorax**.

Condition	Clinical Signs	Immediate Technical Intervention
Tension Pneumothorax	Deviated trachea, absent breath sounds, hyper-resonance, hypotension.	Needle decompression (5th intercostal space, mid-axillary line) followed by tube thoracostomy.
Open Pneumothorax	"Sucking" chest wound, respiratory distress.	Three-sided occlusive dressing.
Massive Hemothorax	Dullness to percussion, shock, absent breath sounds.	Tube thoracostomy (32-36 Fr) and volume restoration.

3. Circulation and Hemorrhage Control

Shock in trauma is considered hemorrhagic until proven otherwise. The 10th edition emphasizes **balanced resuscitation**. The historical practice of administering 2 liters of isotonic crystalloids has been replaced by a more conservative 1-liter bolus (for adults) to avoid **dilutional coagulopathy** and **trauma-induced coagulopathy (TIC)**.

The technical evaluation of circulation involves assessing skin color, pulse (rate and quality), and level of consciousness. The **Shock Index (HR/SBP)** is often used as a more sensitive indicator of occult shock than blood pressure alone. Furthermore, the use of the **FAST (Focused Assessment with Sonography for Trauma)** exam is critical in identifying internal sources of hemorrhage in the peritoneal, pericardial, or pleural spaces.

Comparison of Trauma and Cardiac Life Support Standards

Medical professionals in Indonesia often undergo a triad of certifications: **ACLS (Advanced Cardiovascular Life Support)**, **BCLS (Basic Cardiac Life Support)**, and **ATLS**. While they share some systemic commonalities, their technical focuses differ significantly.

Feature	ATLS (Advanced Trauma)	ACLS (Advanced Cardiac)	BCLS (Basic Cardiac)
Primary Objective	Identify/Treat life-threatening trauma.	Manage cardiac arrest/arrhythmias.	Basic CPR and AED usage.
Core Sequence	ABCDE (Simultaneous if team-based).	CAB (Circulation, Airway, Breathing).	CAB.
Key Technology	FAST Scan, Chest Tubes, X-ray.	ECG, Defibrillator, Capnography.	AED.

Technical Mechanisms of Shock Classification

A critical component of the ATLS 10th edition curriculum is the classification of hemorrhagic shock, which assists clinicians in estimating blood loss based on physiological parameters. This allows for the calibration of the **Massive Transfusion Protocol (MTP)**.

Shock Class Matrix (Adults)

- Class I (Loss <15%): Minimal physiological change. HR <100. Normal BP.
- Class II (Loss 15-30%): Tachycardia (HR 100-120), narrowed pulse pressure. Tachypnea.
- Class III (Loss 31-40%): Significant hypotension, marked tachycardia (HR >120), altered mental status.

Requires blood products.

- Class IV (Loss >40%): Immediate life-threat. HR >140. Minimal urine output. Cold, pale skin. Immediate MTP required.

Procedural Field Guide: The Secondary Survey

The Secondary Survey begins only after the Primary Survey is completed, resuscitative efforts are underway, and the patient shows normalization of vital functions. This is a **head-to-toe** evaluation and includes a detailed medical history using the **AMPLE** mnemonic:

1. A: Allergies.
2. M: Medications currently taken.
3. P: Past medical history/Pregnancy.
4. L: Last meal (Time of ingestion).
5. E: Events/Environment related to the injury.

During this phase, technical adjuncts such as CT scans, retrograde urethrography, and detailed neurological exams are performed. In Indonesia's clinical practice, this phase often determines the necessity of transfer from a Type C or D hospital to a Type A referral center with neurosurgical or cardiothoracic capabilities.

Case Study: Polytrauma Management in an Urban Setting

Consider a 32-year-old male involved in a high-velocity motor vehicle accident in Jakarta. Upon arrival at the emergency department (ED):

- Initial Assessment: Airway patent, but patient is tachypneic (RR 28) and tachycardic (HR 125). GCS is 13 (E3, V4, M6).
- Primary Survey: Decreased breath sounds on the right. FAST scan shows free fluid in the Morison's pouch (perihepatic space).

- Intervention: Right-sided chest tube is placed, evacuating 300cc of blood. A 1L bolus of warmed Ringer's Lactate is initiated.
- Complication: Patient remains hypotensive (BP 85/50). In accordance with ATLS 10th edition guidelines, the team activates the Massive Transfusion Protocol (MTP), ordering a 1:1:1 ratio of Packed Red Blood Cells (PRBCs), Fresh Frozen Plasma (FFP), and Platelets.
- Result: Stabilized for emergency laparotomy to address a splenic laceration.

This case illustrates the application of the **ATLS Technical Workflow**: identifying the breathing issue (pneumo/hemothorax) and the circulation issue (intra-abdominal bleed) and escalating from crystalloids to blood products when the patient is a "non-responder" or "transient responder."

Implementation Challenges and Troubleshooting in the Indonesian Context

While the ATLS framework is robust, several operational challenges exist within the Indonesian archipelago that require technical adaptability:

- Logistical Constraints: The availability of blood products in remote regions. Solution: Utilization of Fresh Whole Blood in extreme emergencies or Permissive Hypotension (keeping SBP ~90mmHg) until surgical intervention is possible.
- Communication Gaps: Handovers from pre-hospital (AGD 118) to hospital staff. Solution: Standardized SBAR (Situation, Background, Assessment, Recommendation) reporting integrated with ATLS findings.
- Equipment Maintenance: Troubleshooting malfunctioning ventilators or suction units. Clinical staff must be proficient in manual ventilation techniques (Bag-Valve-Mask) and manual airway clearing.

Advanced Formula for Trauma Assessment: The Revised Trauma Score (RTS)

The RTS is a physiological scoring system used for triage and to predict outcome. It is calculated based on three parameters: GCS, Systolic Blood Pressure (SBP), and Respiratory Rate (RR).

Formula: $RTS = 0.9368 \text{ GCS_v} + 0.7326 \text{ SBP_v} + 0.2908 \text{ RR_v}$

Where $_v$ is the coded value (0-4) for each range. Higher scores indicate better prognosis. Technical writers and researchers in Indonesia use these metrics to audit hospital performance and trauma system efficacy.

Synthesizing the ATLS Framework

The Advanced Trauma Life Support program represents more than just a set of instructions; it is a standardized language for trauma care that transcends borders. For Indonesian medical practitioners—from those attending the 2016 Jakarta ATLS sessions to those studying the latest 10th edition Indonesian translations—the core mission remains the prevention of preventable deaths. By mastering the technical nuances of the Primary and Secondary Surveys, understanding the physiological shifts in shock, and implementing evidence-based resuscitation strategies, clinicians provide the best possible chance for patient recovery.

As trauma systems in Indonesia continue to mature, the integration of ATLS with local resources and advanced surgical capabilities will remain the cornerstone of emergency medicine. The transition from the 9th to the 10th edition signifies an ongoing commitment to scientific rigor, ensuring that the "Golden Hour" is utilized with maximum technical efficiency and clinical precision.

Baca Juga (Artikel Terkait)

- [Comprehensive Haematology Curriculum: A Framework for Medical Education and Specialty Training](http://alaskawriters.com/haematology-curriculum-medical-education-framework.pdf)

URL: <http://alaskawriters.com/haematology-curriculum-medical-education-framework.pdf>

- [The Definitive Guide to the AHA ACLS Instructor Manual: Technical Standards and Pedagogical Frameworks](http://alaskawriters.com/comprehensive-guide-aha-acls-instructor-manual-training-standards.pdf)

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