

GLOBAL
EDITION



International Trauma Life Support *for Emergency Care Providers*

NINTH EDITION

Roy L. Alson, PhD, MD, FACEP, FAEMS
Kye H. Han, MBBS, FRCS, FRCES
John E. Campbell, MD, FACEP



*Ninth Edition
Global Edition*

INTERNATIONAL Trauma Life Support

for Emergency Care Providers

ROY L. ALSON, PhD, MD, FACEP, FAEMS

KYEE H. HAN, MBBS, FRCS, FRCEM

JOHN E. CAMPBELL, MD, FACEP



Pearson

Harlow, England • London • New York • Boston • San Francisco • Toronto • Sydney • Dubai • Singapore • Hong Kong
Tokyo • Seoul • Taipei • New Delhi • Cape Town • São Paulo • Mexico City • Madrid • Amsterdam • Munich • Paris • Milan

International Trauma Life Support for Emergency Care Providers, Global Edition

Table of Contents

Cover

Title Page

Copyright Page

Dedication

Table of Contents

About the Editors

Organization of This Book

Acknowledgments

Introduction to the ITLS Course

International Trauma Life Support Courses

SECTION 1 Essential Information

CHAPTER 1 Introduction to Traumatic Disease

Chapter Overview

Situational Awareness

Case Presentation

Scene Size-up

Standard Precautions

Scene Safety

Total Number of Patients

Essential Equipment and Additional Resources

Mechanism of Injury

Blunt Trauma

Penetrating Trauma

Priorities of Trauma Care

Trauma Triage Decisions

Prevention and Public Education

CHAPTER 2 Trauma Assessment and Management

Chapter Overview

Case Presentation

ITLS Primary Survey

Table of Contents

Scene Size-up

Initial Assessment

Rapid Trauma Survey or Focused Exam

ITLS Reassessment Exam

ITLS Secondary Survey

Adjuncts for Trauma Patient Assessment

Transfer of Care

CHAPTER 3 Assessment Skills

ITLS Primary SurveyCritical Information

Scene Size-up

Initial Assessment

Rapid Trauma Survey

ITLS Reassessment ExamCritical Information

Subjective Changes

Mental Status

Reassess ABCs

ITLS Secondary SurveyCritical Information

SAMPLE History

Vital Signs and Repeat Initial Assessment

Neurological Exam

Detailed Exam

Ground Rules for Teaching and Evaluation

CHAPTER 4 Hemorrhage Control and Shock

Chapter Overview

Case Presentation

Pathophysiology of Shock

Evaluation of Tachycardia

The Shock Syndromes

Management

Special Situations in Hypovolemic Shock

Obstructive Shock

Cardiogenic Shock

Current Thinking in the Treatment of Shock

CHAPTER 5 Shock and Hemorrhage Control Skills

Cannulation of the External Jugular Vein

Intraosseous Infusion

Indications

Contraindications

Recommended Sites

Potential Complications

Table of Contents

FAST Responder Intraosseous Device

Length-Based Resuscitation Tapes

Control of Life-Threatening Hemorrhage

Application of Tourniquets

Use of Hemostatic Agents

CHAPTER 6 Airway Management

Chapter Overview

Case Presentation

Anatomy and Physiology

Nasopharynx

Oropharynx

Hypopharynx

Larynx

Trachea and Bronchi

The Lungs

The Patent Airway

Observation

Suction

Airway Adjuncts

Supplemental Oxygen

Ventilation

Normal Ventilation

Positive-Pressure (Artificial) Ventilation

Compliance

Ventilation Techniques

Airway Equipment

CHAPTER 7 Airway Skills

Chapter Overview

Basic Airway Management

The Pulse Oximeter

Supraglottic Airways

Advanced Airway Management

Preparation for Intubation

Face-to-Face Intubation

Confirmation of Tube Placement

Drug-Assisted Intubation

Fiberoptic and Video Intubation

SECTION 2 Foundational Knowledge

CHAPTER 8 Thoracic Trauma

Table of Contents

Chapter Overview

Case Presentation

The Thorax

Anatomy

Pathophysiology

Emergency Care of Chest Injuries

Airway Obstruction

Flail Chest

Open Pneumothorax

Massive Hemothorax

Tension Pneumothorax

Cardiac Tamponade

Myocardial Contusion

Traumatic Aortic Rupture

Tracheal or Bronchial Tree Injury

Diaphragmatic Tears

Pulmonary Contusion

Blast Injuries

Other Chest Injuries

Impaled Objects

Traumatic Asphyxia

Simple Pneumothorax

Sternal Fractures

Simple Rib Fracture

CHAPTER 9 Thoracic Trauma Skills

Chapter Overview

Chest Decompression

Indications to Perform Chest Decompression

Performing a Chest Decompression by the Anterior Approach

Performing a Chest Decompression by the Lateral Approach

Management of Open Pneumothorax

CHAPTER 10 Spinal Trauma and Spinal Motion Restriction

Chapter Overview

Case Presentation

Evolution of Spinal Motion Restriction

Relationship to Patient Safety

Patient-Specific and Appropriate Spinal Motion Restriction

Summary of Patient-Centered Spinal Motion Restriction

The Normal Spinal Column and Cord

Spinal Column

Table of Contents

Spinal Cord

Spinal Injury

Mechanisms of Blunt Spinal Column Injury

Pathophysiology of Spinal Cord Injury

Neurogenic Shock

Assessment of the Trauma Patient

Assessing for Possible Spinal Injury

Focused Evaluation of the Spinal Cord

Management of the Trauma Patient

Minimizing Spinal Movement

Spinal Motion Restriction in the Trauma Patient

The Log Roll

Spinal Motion Restriction Devices

Complications of Spinal Motion Restriction

Airway Intervention

Special Spinal Motion Restriction Situations

CHAPTER 11 Spine Management Skills

Essential Components of Spinal Motion Restriction

Principles of SMR

Applying SMR

Patients Requiring SMR

SMR with a Short Extrication Device

Emergency Rescue and Rapid Extrication

SMR with the Long Backboard

CHAPTER 12 Head Trauma and Traumatic Brain Injury

Chapter Overview

Case Presentation

Anatomy of the Head

Pathophysiology of Head Trauma

Primary and Secondary Brain Injuries

Intracranial Pressure

Cerebral Herniation Syndrome

Head Injuries

Facial Injuries

Scalp Wounds

Skull Injuries

Brain Injuries

Evaluation of the Patient with Traumatic Brain Injury

ITLS Primary Survey

ITLS Secondary Survey

Table of Contents

ITLS Reassessment Exam

Management of the Patient with TBI

CHAPTER 13 Abdominal Trauma

Chapter Overview

Case Presentation

Anatomy of the Abdomen

Types of Abdominal Injuries

Assessment and Stabilization

Scene Size-up

Patient Assessment

Stabilization

New Trends in Managing Abdominal Trauma

CHAPTER 14 Extremity Trauma

Chapter Overview

Case Presentation

Injuries to Extremities

Fractures

Dislocations

Open Wounds

Amputations

Neurovascular Injuries

Sprains and Strains

Impaled Objects

Compartment Syndrome

Crush Injury and Crush Syndrome

Assessment and Management

Scene Size-up and History

Assessment

Management of Extremity Injuries

Management of Specific Injuries

CHAPTER 15 Extremity Trauma Skills

Traction Splints

Pelvic Stabilization Techniques

CHAPTER 16 Trauma Arrest

Chapter Overview

Case Presentation

The Unsalvageable Patient

Airway and Breathing Problems

Table of Contents

Circulatory Problems

Approach to Trauma Patients in Cardiac Arrest

General Plan of Action

Considerations in Traumatic Cardiac Arrest Management

SECTION 3 Special Populations

CHAPTER 17 Burns

Chapter Overview

Case Presentation

Anatomy and Pathophysiology

The Skin

Classifying Burns by Depth

Determining the Severity of Burns

Patient Assessment and Management

ITLS Primary Survey

ITLS Secondary Survey

Patient Management

Special Problems in Burn Management

CHAPTER 18 Pediatric Trauma

Chapter Overview

Case Presentation

Communication with the Child and Family

Parental Consent

Assessment and Care

Pediatric Equipment

Common Mechanisms of Injury

General Assessment

Rapid Trauma Survey or Focused Exam

Critical Trauma Situation

ITLS Secondary Survey

Potentially Life-Threatening Injuries

Hemorrhagic Shock

Fluid Resuscitation

Head Trauma

Chest Injury

Abdominal Injury

Spine Injury

Child Restraint Seats

CHAPTER 19 Geriatric Trauma

Chapter Overview

Table of Contents

Case Presentation

Pathophysiology of Aging

The Aging Body

Medications

Aging and Injury

Assessment and Management

ITLS Primary Survey

Reassessment Exams

CHAPTER 20 Trauma in Pregnancy

Chapter Overview

Case Presentation

Pregnancy

Fetal Development

Physiologic Changes During Pregnancy

Responses to Hypovolemia

Assessment and Management

Special Considerations

Types of Trauma

Trauma Prevention in Pregnancy

CHAPTER 21 The Impaired Patient

Chapter Overview

Case Presentation

Substance Abuse

Assessment and Management

The Uncooperative Patient

Excited Delirium

GLOSSARY

INDEX

A

B

C

D

E

F

G

H

Table of Contents

I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
Z

APPENDIX A Standard Precautions

APPENDIX B Analgesia and Pain Control for the Trauma Patient

APPENDIX C Multicasualty Incidents and Triage