Coordinator and Instructor Guide
International Trauma Life Support
for Emergency Care Providers
Seventh Edition

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Mission Statement of the ITLS Organization

International Trauma Life Support, Inc. is a global organization dedicated to preventing death

and disability from trauma through education and emergency trauma care.

Preface

The Alabama Chapter of the American College of Emergency Physicians (ACEP) developed the Basic Trauma Life Support (BTLS) course in 1982. The decision to develop such a course was based on the need for good "hands-on" continuing education courses for EMTs and other EMS personnel. BTLS has since changed its name to International Trauma Life Support (ITLS) and become accepted internationally as the standard training course for prehospital trauma care and now is not only taught as a continuing education course but also used in many EMT training programs.

This instructor and coordinator guide is designed to help you conduct an organized ITLS course. ITLS courses are monitored and certified by local ITLS chapters. Student texts and slides are available to be used with this manual. The ITLS course is usually conducted over a two-day period, but if time is available, this material can be better taught over a longer period, such as during EMT training. Information about how to schedule a certified course in your area can be obtained by contacting the ITLS office:

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Overview of Provider ITLS Courses

Trauma is one of the leading causes of death and disability, not only in the United States but also all over the world.[1] During the course of a year, almost 1 in every 4 U.S. citizens is injured and 1 in 20 is disabled to some degree. Many of these patients require surgical intervention or other advanced capabilities available only in the hospital. For these patients, the difference between recovery and death is often measured in minutes. Thus, the care provided by rescuers, both pre-hospital and hospital, is crucial.

The primary purpose of the ITLS course is to provide students with the fundamental knowledge and experience necessary to get the trauma patient to the emergency department in the best possible condition. The ITLS course focuses on the skills necessary to recognize mechanisms of injury; perform an organized, time-efficient assessment; prioritize and perform critical interventions; and appropriately package and transport the trauma patient. A major focus of the course is the identification of conditions that require immediate transport ("load and go") in order to save the patient. The ITLS course is designed to teach basic level (EMT-Bs and first responders); and advanced level (paramedics, advanced EMTs, nurses, etc.) EMS providers. Life-saving techniques are taught or reviewed in practical exercises. Newly developed equipment is provided, when possible, to allow the students to become familiar with state-of-the-art techniques and equipment.

Although the course is designed for the prehospital phase of EMS, it is also useful to medical

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students, emergency medicine residents, registered nurses, nurse practitioners, and physician assistants interested in trauma care. Not only will the lectures and most of the skills be useful, but they will also provide a unique view of the world in which EMTs must function, which is very different from the "cozy confines" of the emergency department.

COURSE SYNOPSIS

The two-day format for ITLS courses is considered the most practical, even though it limits lecture time and requires precise timing of practice stations. Most students and faculty simply do not have more than 2 days available to attend courses. Where there are no time constraints, you may take more time with both the lectures and the skill stations and thus enhance learning the material. An excellent way to do this is to teach the course over 2-and-a-half days, in the evenings twice a week, or over a college semester. Sample schedules are included later in this chapter.

LECTURES

Coordination of the lectures is of utmost importance. The lectures set the stage for the course, and equipment malfunction or speaker delays detract from the remainder of the course. The lecture assignments may be divided among the instructors or handled by one instructor as desired. The course director or coordinator should take into consideration each person's ability to lecture. It is important that the instructors are assigned and have the PowerPoint slide presentation at least 2 weeks before the course. It is advisable that each instructor be given the questions pertaining to his or her lecture that will appear on the written examination. It is also important for

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the course director to be available in the event that an instructor is late or does not show up. The course coordinator or director must get the lecturers started and finished on time. Chapter objectives and key lecture points can be found in Chapter 6.

Many ITLS provider course are considered "combined" courses with both basic and advanced level students. Basic and advanced courses may also be taught separately.

Advanced ITLS

The first 22 chapters of the student manual are considered "core" material and should be covered in all courses. All appendix material is now included in the student section of the online Resource Central and is optional. The optional material should *not* be covered in a 2-day or 2-and-a-half-day course (there is too much material to cover). If you are teaching ITLS as part of the curriculum of an advanced EMT or paramedic course, it is reasonable to include the optional material in Resource Central.. The students must be notified in advance if any optional material is to be covered.

Basic ITLS

Chapters 1–4, Chapter 5: Basic Airway Management, Chapters 6, 8, 10–20, and 22 are considered core material and should be covered in all basic courses. (Chapter 5: Advanced Airway Management and Chapters 7, 9, and 21 are for the advanced course.) The appendix material in the student section of the Rescource Central is optional and should *not* be covered in a 2-day or 2-and-a-half-day course (there is too much material to cover). If you are teaching ITLS as part of the curriculum of an EMT course, it is reasonable to include the basic-level appendix information in Resource Central. The students must be notified in advance if any op-

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tional material is to be covered.

SKILL STATIONS

Skill stations are the heart of the ITLS course and are a key component to student success. The skill stations should complement lectures and not repeat information already presented.

Skill station objectives, equipment lists, and teaching outlines can be found in Chapter 6 of this Coordinator and Instructor Guide. The skill stations are:

1. Basic and Advanced Airway Management

2. Short SMR Devices/Emergency Rescue and Rapid Extrication

3. Traction Splints

4. Helmet Management/Log Roll/Long Backboard

5. Chest Decompression/Fluid Resuscitation

6. Patient Assessment and Management

Advanced ITLS

Skill Stations 1–6 are core skills for the advanced course. There are two Patient Assessment and Management skill stations during the skill station rotations. During the first rotation, students observe a detailed demonstration of patient assessment and review the ground rules of practice and testing. Students should understand the specific steps of the assessment and the implications

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for management after the first rotation. During the second rotation, students practice patient assessment using a scenario (see Chapter 6, Skill Station 6).

You are not expected to teach all types of traction splints. Teach the traction splint in common use in your area. In the chest decompression station, it is recommended that you teach the anterior chest technique. Both external jugular vein cannulation and intraosseous infusion are core skills, but some ITLS chapters do not teach external jugular vein cannulation if the students are already skilled in the procedure.

All skills contained in Resource Central are optional but may be taught if time permits. The students must be notified in advance if any optional material is to be covered.

Basic ITLS

Skill Stations 1–4 and 6 are core skills for the basic course. (Skill Station 5: Chest Decompression/Fluid Resuscitation is taught only in the advanced course.) There are two Patient Assessment and Management skill stations during the skill station rotations. During the first rotation, students observe a detailed demonstration of patient assessment and review the ground rules of practice and testing. Students should understand the specific steps of the assessment and the implications for management after the first rotation. During the second rotation, students practice patient assessment using a scenario (see Chapter 6, Skill Station 6).

You are not expected to teach all types of traction splints. Teach the traction splint in common use in your area.

All the optional skills in Resource Central are considered advanced skills and should not be taught in the basic course.

Skill Station Rotations

The students must be assigned to groups for skill station rotations. An easy way to do this is to divide them into the same number of groups as there are skill stations (see the tentative schedules later in this chapter) and assign a number for each group for the skill station rotations. It does not matter if all of the groups do not have the same number of students.

> **EXAMPLE:** If there are 24 students and 7 skill stations, you would have four groups of three students and three groups of four students.

> **EXAMPLE:** If there are 20 students and 6 skill stations, you would have four groups of three students and two groups of four students.

An easy way to do this is to point out "1, 2, 3, 4, 5, 6, 7 [to the number of skill stations], Group One; 1, 2, 3, . . . , Group Two," and so on, while the students are still seated. Tell them to report to the skill station that is the same as their group number. In other words, Group One goes to Station 1, Group Two to Station 2, and so on. Explain to the students that, when the timekeeper announces, "CHANGE STATIONS," each group will rotate up one number. For example, Group One goes to Station 2, Group Two goes to Station 3, and so on. Also explain that when rotating from the station with the highest number, that group goes to Station 1. (See the tentative schedules later in the chapter.)

Some combined courses (basic and advanced providers) mingle the students and simply have the basic providers go through all of the skill stations with the advanced providers (getting a break during the advanced portion of the skill stations).

Most course coordinators wait to assign groups until the students have arrived for class. If

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groups are assigned before class begins, you may have to rearrange groups if some of the students do not show up.

PATIENT ASSESSMENT SCENARIO PRACTICE AND TESTING

The patient assessment scenario stations are the heart of the course. They integrate the students' professional experience, the lectures, and the skill stations. They are the stage for the hands-on learning of ITLS. You may choose from the patient assessment scenarios in Chapter 4, or you may make up your own scenarios. If you make up your own scenarios, please send copies to ITLS as we may want to include them in the next *Coordinator and Instructor Guide.* A Scenario Development Sheet is included at the end of Chapter 4 to assist you in completing new scenarios.

Because the Glasgow coma scale (GCS) score is now used in patient assessment, you must provide a copy of the GCS for the students to use when they practice and test (they are not expected to memorize it). A copy of the GCS is included in the Forms section of Chapter 9. You may photocopy it and provide copies to your students for use during patient assessment.

The number of scenarios that you use will depend on the number of students in the course. You need at least one scenario station for each three students. You will never have fewer than six scenarios, as you need that many for a group of three (three practices, three tests). You will almost always need an extra scenario station for retests, but this can be put together at the end of the day if you are short of instructors. It is strongly recommended that you have two instructors for each patient assessment test station, one to interact with the students and one to fill out the grade sheet. If you mingle basic and advanced students, the instructor must indicate the student's

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level of training (basic or advanced) on the grade sheet and conduct the practice and test according to the appropriate level.

When your students are ready to be assigned for rotation of their practice and testing scenarios, they need to be divided into groups of three.

EXAMPLE: If there are 24 students, you would have eight groups of three students. With the students still seated, point out "1, 2, 3, Group One; 1, 2, 3, Group Two," and so on. Tell them to report to the patient assessment station that is the same as their group number. In other words, Group One goes to Station 1, Group Two to Station 2, and so on. Explain to the students that when the timekeeper announces, "CHANGE STATIONS," each group will rotate up one number. For example, Group One goes to Station 2, Group Two goes to Station 3, and so on. Also explain that when rotating from the station with the highest number, that group goes to Station 1.

If your head count leaves you with two students in the last group, they can rotate as a group of two. If your head count leaves you with one student in the last group, take that student and one student from another group and make two groups of two. A group of four students will not allow your stations to rotate smoothly. The groups of two students will rotate to the third practice station. One of the students will practice twice. This allows the group of two to participate in three practice stations, the same as the other groups. When they move to the fourth station, it will be a test as it is for everyone else. However, after both students test, they will be finished.

Each scenario station should have three rotations for practice at 20 minutes per rotation, and three rotations for testing at 10 minutes per rotation. These times may vary according to your discretion.

By using this system, your rotations will be smooth with very little coordinating, and nothing needs to be written down. Students who do not show up for the course will not affect your rotations. Enough copies of grade sheets must be made so that each station will have enough for all the teams that practice and test. A grade sheet is filled out for each team (specifically, the team leader) that practices or tests in a station.

It is strongly recommended that all groups rotate through the patient assessment testing stations at the same time. However, if there is an insufficient number of faculty members to conduct concurrent stations for each group, some course coordinators have allowed half of the groups to take the written exam while the other half take the patient assessment test. If you must use this type of rotation, it is very important to keep the two groups of students separated so there is no exchange of test information (written or practical) between the two groups.

EXAMPLES OF COURSE TIMETABLES

The classic ITLS course schedule has had lectures in the morning and skills in the afternoon for 2 days. It was originally done this way to follow the example of the ATLS and ACLS courses. The schedule was designed to give the students a break after 4 hours of lectures. The problem with this is that you are teaching skills that will not be covered in a lecture until the second day. Several ITLS chapters have modified the schedule so that all of the lectures are taught the first day, all of the skill stations are taught the second morning, and the second afternoon is spent in testing. Many of the students find this more acceptable in spite of facing 8 hours of lectures on the first day. This schedule also allows you to have fewer instructors the first day. ITLS has taken no stand on this issue, and you may choose whichever schedule works best for you. Samples

of both schedules are provided. ITLS may also be offered in a case-based approach. Schedules are available from the ITLS office.

TRADITIONAL SAMPLE COURSE TIMETABLES

(ADVANCED PROVIDERS)

Sample Course Timetable: Advanced Two-Day Course, Lectures Both Days

First Day

Sign-In and Collection of Pretests	30 min
Welcome and Introduction	5 min
Standard Precautions	10 min
Scene Size-Up	30 min
Patient Assessment and Management, and Trauma Arrest	45 min
Patient Assessment Demonstration or DVD	15 min
Break	15 min
Airway Management	30 min
Shock Evaluation and Management	30 min
Lunch and Faculty Meeting	60 min
Thoracic and Abdominal Trauma	30 min

Head and Spinal Trauma	30 min
Extremity Trauma	30 min
Skill Stations (30 minutes each)	210 min

1. Basic and Advanced Airway Management

2. Short SMR Devices/Emergency Rescue and Rapid Extrication

3. Traction Splints

4. Helmet Management/Log Roll/Long Backboard

5. Chest Decompression/Fluid Resuscitation

6. Patient Assessment and Management

7. Patient Assessment and Management

Faculty Meeting	30 min

Second Day

Burns	45 min
Trauma in Pregnancy	30 min
Trauma in Children	45 min
Break	15 min
Trauma in the Elderly	25 min
Patients Under the Influence	20 min

Patient Assessment Scenarios	60 min
Lunch and Faculty Meeting	60 min
Patient Assessment Scenarios	90 min
Practical and Written Examination	120 min
Faculty Meeting	30 min
Results to Students	

Sample Course Timetable: Advanced Two-Day Course, Lectures First Day

First Day

Sign-In and Collection of Pretests	30 min
Welcome and Introduction	15 min
Standard Precautions	10 min
Scene Size-Up	30 min
Patient Assessment and Management, and Trauma Arrest	45 min
Patient Assessment Demonstration or DVD	15 min
Break	15 min
Trauma in Pregnancy/Elderly Trauma	45 min
Shock Evaluation and Management	30 min

Trauma in Children	45 min
Lunch	60 min
Thoracic Trauma	30 min
Head Trauma	30 min
Airway Management	30 min
Abdominal/Extremity Trauma	45 min
Break	15 min
Burns	45 min
Spinal Trauma	30 min
Patients Under the Influence	20 min
Patient Assessment Demonstration or DVD	15 min
Faculty Meeting	30 min

Second Day

Patient Assessment Demo, Questions and Answers	30 min
Skill Stations (30 minutes each)	210 min

1. Basic and Advanced Airway Management

2. Short SMR Devices/Emergency Rescue and Rapid Extrication

3. Traction Splints

Campbell/Coordinator and Instructor Guide for *International Trauma Life Support, 7/e*

4. Helmet Management/Log Roll/Long Backboard

5. Chest Decompression/Fluid Resuscitation

6. Patient Assessment and Management

7. Patient Assessment and Management

Lunch	60 min
Written Test	30 min
Practice and Testing Scenario Stations	120 min
Faculty Meeting	30 min
Results to Students	

Sample Course Timetable: Advanced Two-and-a-Half-Day Course

First Evening

Faculty Meeting	15 min
Sign-In and Collection of Pretests	30 min
Welcome and Introduction	15 min
Scene Size-Up	30 min
Patient Assessment and Management, and Trauma Arrest	45 min
Patient Assessment Demonstration or DVD	15 min

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Break   15 min

Patient Assessment Practice   90 min

The students should be divided into groups of six. There should be enough stations set up (4 for a class of 24 or 6 for a class of 36) for each group to watch one patient assessment demonstration and then divide into two groups of three to practice patient assessment.

Second Day

Sign-In and Coffee   30 min

Airway Management   30 min

Thoracic Trauma/Shock Evaluation and Management   60 min

Spinal Trauma   30 min

Break   15 min

Head Trauma   30 min

Abdominal/Extremity Trauma   45 min

Burns   30 min

Lunch and Faculty Meeting   60 min

Skill Stations (30 minutes each)   150 min

1. Basic and Advanced Airway Management

2. Short SMR Devices/Emergency Rescue and Rapid Extrication

3. Traction Splints

4. Helmet Management/Log Roll/Long Backboard

5. Chest Decompression/Fluid Resuscitation

Faculty Meeting   30 min

Third Day

Sign-In and Coffee   30 min

Trauma in Pregnancy/Elderly Trauma   30 min

Trauma in Children   30 min

Patients Under the Influence   20 min

Standard Precautions   15 min

Break and Faculty Meeting   15 min

Patient Assessment Practice and Testing   90 min

Lunch   60 min

Written Test   30 min

Continue Patient Assessment Practice and Testing

Faculty Meeting   30 min

Results to the Students

TRADITIONAL SAMPLE COURSE TIMETABLES (BASIC PROVIDERS)

Sample Course Timetable: Basic Two-Day Course, Lectures Both Days

First Day

Sign-In and Collection of Pretests	30 min
Welcome and Introduction	5 min
Standard Precautions	10 min
Scene Size-Up	30 min
Patient Assessment and Management	45 min
Patient Assessment Demonstration or DVD	15 min
Break	15 min
Airway Management	30 min
Shock Evaluation and Management	30 min
Lunch and Faculty Meeting	60 min
Thoracic and Abdominal Trauma	30 min
Head and Spinal Trauma	30 min
Extremity Trauma	30 min
Skill Stations (30 minutes each)	180 min

1. Basic Airway Management

2. Short SMR Devices/Emergency Rescue and Rapid Extrication

3. Traction Splints

4. Helmet Management/Log Roll/Long Backboard

5. Patient Assessment and Management

6. Patient Assessment and Management

Faculty Meeting   30 min

Second Day

Burns   45 min

Trauma in Pregnancy   30 min

Trauma in Children   45 min

Break   15 min

Trauma in the Elderly   25 min

Patients Under the Influence   15 min

Patient Assessment Scenarios   60 min

Lunch and Faculty Meeting   60 min

Patient Assessment Scenarios   90 min

Practical and Written Examination   120 min

Faculty Meeting   30 min

Results to Students

Sample Course Timetable: Basic Two-Day Course, Lectures First Day

First Day

Sign-In and Collection of Pretests	30 min
Welcome and Introduction	15 min
Scene Size-Up	30 min
Standard Precautions	10 min
Patient Assessment and Management	45 min
Patient Assessment Demonstration or DVD	15 min
Break	15 min
Trauma in Pregnancy/Elderly Trauma	45 min
Shock Evaluation and Management	30 min
Trauma in Children	45 min
Lunch	60 min
Head Trauma	30 min
Airway Management	30 min
Thoracic Trauma	30 min

Abdominal/Extremity Trauma	45 min
Break	15 min
Burns	45 min
Spinal Trauma	30 min
Patients Under the Influence	15 min
Faculty Meeting	30 min

Second Day

Patient Assessment Demo	
Questions and Answers	30 min
Skill Stations (30 minutes each)	180 min

1. Basic Airway Management

2. Short SMR Devices/Emergency Rescue and Rapid Extrication

3. Traction Splints

4. Helmet Management/Log Roll/Long Backboard

5. Patient Assessment and Management

6. Patient Assessment and Management

Lunch	60 min
Written Test	30 min

Practice and Testing Scenario Stations	120 min
Faculty Meeting	30 min
Results to Students	

Sample Course Timetable: Basic Two-and-a-Half-Day Course

First Evening

Faculty Meeting	15 min
Sign-In and Collection of Pretests	30 min
Welcome and Introduction	15 min
Scene Size-Up	30 min
Patient Assessment and Management	45 min
Patient Assessment Demonstration or DVD	15 min
Break	15 min
Patient Assessment Practice	90 min

The students should be divided into groups of six. There should be enough stations set up (4 for a class of 24 or 6 for a class of 36) for each group to watch one patient assessment demonstration and then divide into two groups of three to practice patient assessment.

Second Day

Sign-In and Coffee	30 min
Airway Management	30 min
Thoracic Trauma	30 min
Shock Evaluation and Management	30 min
Spinal Cord Trauma	30 min
Break	15 min
Head Trauma	30 min
Abdominal/Extremity Trauma	45 min
Burns	30 min
Lunch and Faculty Meeting	60 min
Skill Stations (30 minutes each)	120 min

1. Basic Airway Management

2. Short SMR Devices/Emergency Rescue and Rapid Extrication

3. Traction Splints

4. Helmet Management/Log Roll/Long Backboard

Faculty Meeting	30 min

Third Day

Sign-In and Coffee	30 min
Trauma in Pregnancy/Elderly Trauma	30 min
Trauma in Children	30 min
Patients Under the Influence	15 min
Standard Precautions	15 min
Break and Faculty Meeting	15 min
Patient Assessment Practice and Testing	90 min
Lunch	60 min
Written Test	30 min
Continue Patient Assessment Practice and Testing	
Faculty Meeting	30 min
Results to the Students	

FACULTY MEETINGS

Precourse

This meeting has traditionally taken place after dinner the night before the course but may just as well be done early in the morning during course registration. This meeting serves several important functions:

1. Orient the faculty to each other and to the site.

2. Orient the faculty to the particular student composition (EMT-Bs, first responders, paramedics, registered nurses, medical students, medical residents, etc.).

3. Update the final changes in the agenda and remind faculty of the importance of adhering to scheduled lecture times.

4. Update the latest ITLS innovations and directives from the affiliate faculty present.

5. Review the goals and objectives of an ITLS course (see Chapter 2).

6. Remind faculty that the discussion of students that takes place in the faculty meetings is to be kept in the meetings.

7. Review both the Coordinator and Instructor Guide and the student manual to ensure consistency among instructors for the entire course.

8. Review available equipment and its distribution.

9. Review any skill station revisions, and local procedures or protocols that might directly impact the station.

10. Identify last-minute faculty no-shows and forgotten lecture slide sets.

11. Encourage faculty to have a meeting at lunch each day to discuss the afternoon's practical stations.

Before Skill Station Rotations

This should be a brief meeting to review teaching techniques and objectives of the skill stations.

Specifically stress that skill stations are not for lectures but for demonstration and hands-on

training. Emphasize that each session must begin and end on time.

Before Assessment Scenario Practice and Testing

The most frequent student complaint in course critiques has been inconsistency among the faculty members' teaching and testing assessment scenarios. This meeting should review the following sections in both the student manual and the instructor guide:

1. Ground rules for team practice and testing (Chapter 3 in the student manual).

2. Breakdown of performance criteria (see Chapter 2in the instructor guide).

3. How to fill out the grade sheet (specifically notes to be taken relative to student performance and critical identifying data).

4. Pass/fail criteria (see Chapter 2 in the instructor guide).

5. Retest policy (see Chapter 2 in the instructor guide).

6. Emphasize need to orient models to the scenarios.

7. Reminder that the purpose of the faculty is to help the student learn at least enough to pass. Every effort must be made to identify weaknesses and assist the student in correcting them.

Postcourse

This meeting is to determine each student's final grade. When grading is completed, the faculty should be encouraged to critique the course and offer constructive suggestions for future courses.

Each student's written test scores and patient assessment scores (both practice and test) should be collated with the student's photo (optional) and considered by the faculty.

If a student fails the patient assessment station, the faculty may consider the student's practice grade to see whether a marginal increase in the grade is warranted. The same is true if the student is a possible instructor candidate. The scenario practice grade cannot be used to lower a passing grade. In other words, faculty members should consider practice scores only if they are considering raising the student's grade. Because patient assessment is a somewhat subjective score, there are always some changes (and a lot of lively discussions) at the faculty meeting. The grade sheets of students who fail, especially if they fail the retest, should include careful documentation of why they failed. Students should always be allowed to review the information missed on written tests and patient assessment grade sheets after the faculty meeting. Thus, be very careful in your documentation.

Faculty Critique

This is usually the last time that the faculty will be together until another ITLS course. Now is the time to collect comments from the faculty about the course and the teaching material. How can they be improved? ITLS is always interested in ways to improve the text, slides, and instructor guide. All comments and suggestions are appreciated and carefully considered for changes in future editions. The future development of ITLS depends on continued constructive criticism by students and faculty.

Endnote

1. Peden M., K. McGee, E. Krug (eds.). 2002. *Injury: A Leading Cause of the Global Burden of Disease, 2000.* Geneva, Switzerland: World Health Organization.

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Administrative Considerations

FREQUENTLY ASKED QUESTIONS

What Is the Mission of the ITLS Organization?

ITLS is a global organization dedicated to preventing death and disability from trauma through education and emergency trauma care.

What Are the Goals and Objectives of the Basic and Advanced ITLS Courses?

1. Teach fundamental hands-on trauma care.

2. Teach a target audience of advanced EMTs, paramedics, and registered nurses for the advanced course and a target audience of EMT-Bs and first responders for the basic course.

3. Maintain quality assurance so that the same fundamentals are consistently taught chapter to chapter and yet allow for regional differences.

4. Keep the course current.

5. Keep the course short enough to be taught over two days.

6. Strive to make teaching and learning ITLS simple and practical.

7. Keep the course conservative and noncontroversial so that the principles taught reflect the current standard of care.

Who Can Teach the Course?

Certified ITLS courses must be taught by ITLS instructors. To become an ITLS instructor, one must attend a certified ITLS course, score at least 86% on the written exam, and score "excellent" on patient assessment skills test (chapters may choose to use additional criteria). After successful completion of an instructor course, the instructor candidate must be monitored or take an instructor preceptorship (this varies from chapter to chapter). Basic ITLS instructors can teach only basic ITLS courses. Advanced ITLS instructors can teach basic or advanced ITLS courses. Physicians who are Board certified in emergency medicine, or who are ATLS providers, or who actively participate in and teach trauma care may take the instructor course or preceptorship without taking the full provider course.

In unusual circumstances a physician or other EMS provider (EMT, nurse, nurse practitioner, or physician assistant) who has not taken the instructor course may help teach an ITLS course. However, this may be done only with the permission of the chapter ITLS medical director or ITLS committee. These requirements are necessary to maintain the high quality of certified courses.

Can ITLS Courses be Conducted in Areas That Do Not Have an ITLS Chapter?

ITLS courses may be taught in areas where there is no ITLS chapter or training centre. All the chapter courses must be approved by the International office at least 60 days prior to the course. Applications are available on the ITLS Web site at www.itrauma.org or by calling ITLS at 1-888-495-ITLS (outside U.S.: +1-630-495-6442).

Who Can Take the Course?

The advanced course material requires the ability to start intravenous fluids and to perform advanced airway management. Advanced airway management is defined as the use of a blind insertion airway device, or endotracheal tube. This limits the full course to advanced EMTs, paramedics, medical students, medical residents, registered nurses, nurse practitioners, and physician's assistants. The basic course is for EMS personnel who cannot perform advanced procedures (basic EMTs, first responders, and licensed practical nurses). ITLS does not advocate or condone teaching students to perform skills outside their scope of practice.

What is the ITLS Student Text Policy?

ITLS requires that each student have a copy of the appropriate ITLS course book. Students should receive their book at least 30 days before the course date for adequate time to prepare for the course.

How Many Students Can Be Taught in a Course?

The number of students that can be taught in a course is limited by the availability of faculty, equipment, and classroom space for lecture, skill stations, and patient assessment testing stations. ITLS mandates that a student to faculty ratio be no more than 6:1. Because so much of the teaching is almost one to one, large classes cannot be taught. Most classes range from 24 to 36 students; however, if enough instructors are available, as many as 50 students may be taught.

How Many Instructors Are Required to Teach a Course?

See the Selecting Faculty in the Precourse Planning section of this chapter.

What Must Be Taught in an ITLS Course?

See Lectures and Skill Stations in Chapter 1.

What Constitutes Course Completion?

A student may become an ITLS provider by attending the lectures and skill stations and by passing the written and practical examinations. ITLS providers will receive a card and/or certificate from the ITLS chapter confirming that they have satisfactorily completed the course. Certification is good for 3 years or whatever length is deemed appropriate by the chapter. Such certification does not guarantee future performance, nor is it a form of licensure of any kind. Students who fail either the written or the practical examination after retesting will be given documentation of attendance so they may receive continuing education credit.

Students who successfully complete the written examination but are unable to pass the practical skills may receive a certificate of course completion, but not an ITLS card.

Recertification may be obtained by repeating the provider course or by taking an ITLS recertification course.

What is the ITLS Student Card Policy?

Students should receive ITLS cards as expeditiously as possible. Chapters need to ensure that students receive cards within 30 days of course completion when all fees have been paid.

All chapters must use ITLS-issued certification cards, either printed cards or those downloadable from the ITLS course management system (CMS). No other certification cards may be used. Chapters may, however, modify the course completion certificate for their unique needs.

What Are the Performance Criteria?

Performance criteria for the patient assessment test include the following:

Inadequate Rating

1. Disorganized assessment exams

2. Prolonged on-scene times in the setting of load-and-go situations

3. Critical actions missed (such as not stabilizing the neck)

4. Fatal errors made (such as poor cervical-spine management)

5. Causes death of the patient

Adequate Rating

1. Reasonable organization of assessment exams

2. Accurate identification of load-and-go situations

3. Abbreviated on-scene times for load-and-go situations

4. Performs all critical actions

5. No fatal errors made

Good Rating

1. Organized exams and solid overall performance

2. Interacts well with patient and team members

3. Performs all critical actions

4. Abbreviated on-scene times for load-and-go situations

5. Correctly performs or oversees performance of all critical interventions

Excellent Rating

1. Excellent organization of assessment exams

2. Excellent patient care

3. Interacts well with patient and team members

4. Directs the team well; displays leadership

5. Performs all critical actions

6. Abbreviated on-scene times for load-and-go situations

7. Demonstrates clear understanding of prehospital trauma assessment and management

8. Cooperative and supportive in the learning environment

9. Conveys attitude of interest and desire to help teach trauma assessment and management

What Are the Pass/Fail Criteria?

Students must attend the lectures and skill stations and obtain at least 74% on the written exam

and at least "adequate" on the patient assessment test.

What Is the Retest Policy?

Students who fail only the patient assessment skills test will usually be retested on the same day (time permitting) or given the opportunity to retest within 6 weeks. It is strongly recommended that there be two evaluators for a patient assessment retest. If possible, the evaluator who initially rated the student as "inadequate" should not conduct the retest. Students may not retest in order to raise a passing grade.

Students who fail only the written test may not retake it immediately but will be given an opportunity to retest after having had time to review the material and study identified areas of weakness. The retest will be scheduled within 6 weeks. Students who pass the retest will pass the course. Students who fail the retest *may* be provided an opportunity to retake the course at no charge or for a reduced charge. Students may not retest in order to raise a passing grade.

Students who fail both the written and the patient assessment test will be asked to repeat the course.

What Does Certification Mean?

Certification as an ITLS provider or instructor means that the individual has passed an ITLS course taught by ITLS instructors under the sponsorship of the ITLS organization. It does not certify future performance, nor does it confer licensure of any kind.

How Does an ITLS Provider or Instructor Maintain Certification?

ITLS providers may maintain their certification by taking an ITLS provider or recertification course every 3 years or whatever length is deemed appropriate by the chapter.

ITLS instructors may maintain their instructor certification by teaching at least one ITLS course (instructor or provider) per year for the years of certification and attending instructor updates or refresher courses as deemed necessary by the chapter advisory committee. The chapter advisory committee may develop additional criteria. (See Refresher Course for Instructors in Chapter 7.)

Where Do I Get the Pretest and Posttest?

Your ITLS chapter will provide the pretest and posttest when a certified course is scheduled. This practice ensures that your students will receive the most current version of the tests. This also aids exam security.

PRECOURSE PLANNING

Scheduling a Certified ITLS Course

Certified courses must be scheduled through the ITLS organization in your chapter. If you do not know how to contact this organization in your area, you may obtain information by calling or writing:

Ginny Kennedy Palys

Executive Director

International Trauma Life Support

3000 Woodcreek Drive, Suite 200

Downers Grove, IL 60515 U.S.A.

Phone inside U.S.: 1-888-495-ITLS

Phone outside U.S.: +1-630-495-6442

Fax: +1-630-495-6404

Email: info@itrauma.org

Internet: http://www.itrauma.org

The ITLS online bookstore contains the student manual and other ITLS products. ITLS instructor resources are available in the instructor section of the online Resource Central. More information is available from the ITLS office.

Selecting a Course Coordinator

The course coordinator is the key to a successful program. This position requires someone who is organized and motivated because there is a considerable amount of work involved over several months. See Chapter 8 for the qualifications of a course coordinator.

Teamwork and communication are the keys to a successful ITLS course. The course coordinator must have a smooth working relationship and open communications with the course director and affiliate faculty, because it is teamwork that determines successful outcome. Together they must select the site and the faculty for the course. These selections are made on the basis of availability and the time frame in which they are working. Usually, 3 months are needed for the development of a course from beginning to end, with the last 2 weeks being the most intense.

Selecting a Course Medical Director

The course medical director, or at least one of two codirectors, must be a physician ITLS instruc-

tor. A physician who is not already an instructor may codirect a course with a physician ITLS instructor. It is best if the course medical director is also a local physician. A local physician is better able to appropriately integrate the material into the local prehospital and emergency department systems. A physician ITLS instructor is best prepared to present the material effectively in the manner in which it was designed. The medical director must take overall responsibility for the quality of the course.

Responsibilities include being involved in the planning, scheduling, and actual teaching of the course. The course medical director must also see that the schedule allows adequate time for lectures and skill stations, including ensuring that lecturers stay within the given time frame. If any instructor is not present during the allotted time, the medical director should be able to fill in. The medical director may delegate some or all of these responsibilities to the affiliate faculty. The course medical director will chair the faculty meeting at the end of the course. If questions arise concerning grading, the vote of the majority of the faculty will prevail. The medical director will vote only in the case of a tie.

Selecting Faculty

The faculty for a certified ITLS course must consist of a course medical director, course coordinator, and enough instructors to teach the number of students registered. It is advisable to have a multidisciplinary faculty involved with the course to provide a balanced presentation of the trauma team concept. You must have at least one affiliate faculty at a course.

The number of instructors needed depends on the number of students: The patient assessment testing is one-on-one and requires many instructors in order to keep the length of the course

within reason. The number of instructors used in the lectures varies. Most courses divide the lectures among the instructors, but one instructor can do all of them, if necessary.

Using the classic 2-day sample schedule in Chapter 1 and the recommended minimum faculty in Chapter 6, in addition to the course coordinator and course medical director, an advanced course would require nine faculty on the first day, and a basic course would require eight faculty on the first day. Using these same criteria, an advanced course with 21 students would require at least seven faculty on the second day, whereas an advanced class of 36 students would require at least 12 instructors on the second day for efficiency. A basic course with 21 students would require at least seven faculty on the second day, and a basic class of 36 students would require at least 12 instructors on the second day for efficiency. Obviously, the more patient assessment test stations you have, the more quickly the day will proceed; but it is strongly recommended that you have two instructors for each patient assessment test station, one to interact with the students and one to fill out the grade sheet.

One of the advantages of having all of the skill stations and testing done the second day is that fewer instructors are needed the first day.

When selecting instructors, remember that some people are good at lectures, others are good at practical skills teaching, and a few are good at both. Try to make assignments that correspond to the instructors' abilities. Local faculty should be used whenever possible. The greatest cost involved in an ITLS course is the cost for out-of-town instructors. Many instructors serve without pay, but out-of-town instructors will usually expect to have their travel expenses paid. Although it is preferred to have the same instructors for both days, it is not absolutely necessary, as some faculty have only one day available.

In unusual circumstances a physician or other EMS provider (EMT, registered nurse, nurse practitioner, or physician assistant) who has not taken the instructor course may help teach an ITLS course. However, this may be done only with the permission of the chapter ITLS medical director or committee. This requirement is necessary to maintain the high quality of the certified courses.

Instructors should all be consistent in their teaching methods. There are two ways to promote consistency. One way is to cover all of the normal inconsistencies in the instructor meeting prior to the course. The other is to monitor each lecture and skill station to catch inconsistencies.

During the selection of instructors, you must ensure that at least four of your instructors are very good at patient assessment demonstrations. One way to ensure this is to have those particular instructors demonstrate their skills to the coordinator prior to the course.

Selecting Models

Most ITLS courses use live models for skills stations and testing. Mannequins and patient simulators may also be used.

Because both acting ability and hard work are required of the models, use your best judgment when selecting them. They will be required to submit to being examined, handled, extricated, splinted, and strapped for several hours. Whenever possible, they should be compensated for their efforts. However, some students enjoy the opportunity and may be able to get school credit for serving as a model. Models should be advised in advance of the course that they will always have their chests examined. All models should be furnished with old clothes or asked to wear clothes that they do not mind having ruined (it is a good idea to have clothes made up with

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VELCRO fasteners so they can be pulled apart for exam and then easily stuck back together). Females should be advised to wear bathing suits or other suitable attire under their clothes. Because the models will learn a lot about trauma care, EMTs or EMT students may be used for this role. Students enrolled in the ITLS course should not be used for models except for minor skills such as traction splinting or helmet removal. The weight and age of a model should be a consideration. Models that are too heavy may cause injuries to your students, and models that are too young may have too short an attention span to last through a scenario.

Selecting the Site

Selection of the appropriate site is the responsibility of the course coordinator and medical director. They should inspect the facility to determine the adequacy of the following:

1. Large lecture room to accommodate both students and faculty. The standard ratio for a classroom is one person per 15 square feet. In other words, a 750-square-foot classroom would comfortably fit 50 people.

2. An adequate number of tables and chairs for students and faculty.

3. Find out how many windows are in the classroom. If there are windows, they will need to have shades so the slides projected on a screen can be seen.

4. The room should be adequately ventilated, heated and cooled.

5. Sufficient number of rooms or spaces to accommodate students, faculty, and equipment for skill stations. You will need at least one room or space for each skill station. Plan carefully; some stations require more space due to the amount of equipment. Some stations will require tables, whereas others will require an open space. These rooms must be available prior to the

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start of skill stations to allow equipment to be set up.

Note: These rooms or spaces should be close enough to each other to allow timely rotations, but far enough from each other so that activity in one station does not distract students in another station. Careful selection of rooms can help prevent students from meandering through the halls of the building and pausing to socialize.

6. Sufficient number of rooms or spaces with open space to accommodate students, faculty, and equipment for patient assessment scenarios. You will need at least one room or space for each group of three students. These rooms must be available prior to the start of skill stations to allow equipment to be set up.

Note: These rooms or spaces should be close enough to each other to allow timely rotations, but far enough from each other so that activity in one station does not distract students in another station. Careful selection of rooms can help prevent students from meandering through the halls of the building and pausing to socialize.

7. A room or space that can be secured that is large enough to gather and store equipment while it is not being used in skill stations.

8. On-site or nearby meals to allow students and faculty to return to class on time after lunch. If meals will not be on-site, directions to local restaurants should be available for students and faculty.

9. Privacy, which will prevent distractions to the students and shock to the casual passersby.

ITLS courses have been adequately taught in hotels, churches, community colleges, hospitals, scout camps, and EMS training facilities.

If you are teaching at a facility with which you are not familiar, you should inspect the site, if possible. Be sure that students and faculty get a map of the location with their precourse materials. You will also need the name of a responsible contact person for the facility.

Equipment

Whenever possible, equipment used in the course should match equipment regularly used by the students taking the course. For example, when teaching IO insertion, it is better to use the actual product the students regularly use than teach them on a device they may never see.

Equipment should be assessed and inventoried 2 to 3 weeks prior to the course. When borrowing equipment, the equipment manager (see Delegating Tasks, later in this chapter) should use a detailed checklist to see that *all* equipment is properly identified as to ownership and condition. Both before and after the course, it is advantageous to have staging areas, where equipment is grouped by source. These areas should have limited access and should be used to inventory and label equipment carefully. Any borrowed equipment should be returned cleaned and in good repair. This step is often neglected at the close of the course because of the fatigue and the natural urge to "wrap it up and go home." The equipment list is lengthy, and a great deal of time is required for determining needs and inventory. Equipment needs will vary from course to course, depending on the number of students and the patient assessment situations chosen. There is an equipment list with each skill station. A master equipment list follows, although there is always some variation in equipment needs depending on the assessment scenarios chosen. Though not listed, a large coffeepot is an essential item.

The following are common sources for equipment:

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1. Regional EMS offices

2. Local EMT training departments

3. Hospitals

4. Prehospital provider services

Master Equipment List

The amount of equipment needed for the second day of the course will depend on how many patient assessment scenario stations are being used. To determine your equipment needs, list the total of the equipment that is required for the patient assessment scenario stations you intend to include in the course. Check this list against the amount of equipment needed for the first day. You will usually need more backboards, oxygen masks, bag-valve devices, blood pressure (BP) cuffs, stethoscopes, and trauma boxes. Assess and inventory the complete equipment list 2 to 3 weeks prior to the course.

   The following master equipment list is itemized by category. It covers equipment needed for the core skill stations the first day but not the patient assessment scenarios (each has its own equipment list) the second day. In addition, if you are teaching optional skills, you will need the equipment for those stations. The equipment required for these stations can be found in the optional skill station information in Chapter 9.

Station	Item	Quantity
Skill Station 1—Basic and Advanced Airway Management		

Exam gloves (large nonsterile)	1 box
Goggles/face shield	2
Mannequin, trauma or ACLS (optional)	1
Airway mannequin: Adult	4
Airway mannequin: Pediatric	2
Lubricant for mannequin airway	1
Portable suction machine with charger	2
Manual suction device (optional)	2
Tonsil tip	2
Suction tubes (14–18 Fr.)	2
Tongue blades	10
Oropharyngeal airways (set)	2
Nasopharyngeal airways (set)	2
Pocket mask (with supplemental oxygen nipple)	2
Adult bag-valve device/reservoir	2
Pediatric bag-valve device/reservoir	2
Adult face mask (#4–5)	2
Pediatric face mask (#1–3)	2

Oxygen cylinder with regulator	2
Stand for oxygen cylinder	2
Oxygen tubing	2
Nasal cannula	2
Nonrebreather mask	2
Pulse oximeter	1 or 2
Stethoscope	4
Endotracheal tubes (7–9)	2 ea.
Endotracheal tube (3.5 Fr.)	2
Stylet (adult, pediatric)	2 ea.
Lighted stylet (optional)	1
10-cc syringe	2
Bottle of water	1
Blind insertion airway device (BIAD)	2
Laryngoscope	2
Spare batteries	4
Curved blades (#3–4)	2 ea.
Straight blades (#1–3)	2 ea.

Spare bulbs	1 ea.
Waveform end-tidal CO_2 monitor	1
Colorimetric CO_2 detector (optional)	1
Esophageal detection device (optional)	2

Skill Station 2— Short SMR Devices/Emergency Rescue and Rapid Extrication

Live model	2
Rigid cervical collar (assorted sizes or adjustable)	2 ea.
Long backboard with straps	2
Head or cervical immobilization device	2
KED or similar vest-type extrication device	1
Padding	1
Tape	2
Elastic wrap (ACE)	1
Chair	4
Vehicle (optional)	1 or 2

Skill Station 3—Traction Splints

Live model	2
Padding	2
Tape	1
Thomas splint	1
Sager or Hare splint	1
Tongue blades (for Spanish windlass)	10
Cravat	1

Skill Station 4—Helmet Management/Log Roll/Long Backboard

Live model	2
Rigid cervical collar (assorted sizes or adjustable)	2 ea.
Long backboard with straps	1
Reeves sleeve (optional)	1
Miller full body splint (optional)	1
Vacuum backboard (optional)	1
Head or cervical immobilization device	1
Padding	1

Tape	4 rolls
Elastic wrap (ACE)	1
Motorcycle helmet (full face)	1
Football helmet with face protector	1
Shoulder pads	1 set
Open face helmet	1

Skill Station 5—Chest Decompression/Fluid Resuscitation

Central line (E-J) mannequin (optional)	1
IO mannequin	1
Decompression mannequin (anterior/lateral approach)	1
Tension pneumothorax mannequin (optional) or	1
Artificial tension pneumothorax (materials below)	
Section of pork ribs at least $12'' \times 12''$	1
Small trailer wheel inner tube	1
Valve core remover	1
Hand, foot, or electric air pump	1
8-fluid-ounce bottle of tire puncture sealer	2

Roll of plastic wrap	1
Roll of duct tape or foam latex tape	1
One-way valve	
Asherman Chest Seal (optional)	1
Flutter valve #1	2
Plastic 10-cc syringe	2
Penrose drain	2
Flutter valve #2	20
Rubber condom (insert decompressing needle)	
10-cc syringe	6
14-, 18-, and 20-gauge over-the-needle catheters	20 ea.
IV tubing (optional)	3
Small container of water (optional)	1
Paper towels	2 rolls
20-cc syringe	2
Chicken legs (optional)	6–12
Betadine solution (4-oz bottle)	1
Intraosseous needles	6

Skill Station 6—Patient Assessment (Two Stations)

Exam gloves (large)	2 boxes
Trauma box (jump kit—see below)	2
Monitor-defibrillator (optional)	2
Live model	2
Adult bag-valve device/reservoir	2
Rigid cervical collar (size to fit your model)	2
Long backboard with straps	2
Head immobilization device	2
Padding	2
Moulage kit or white tape and red felt-tip pen	1

Trauma box or "jump kit" (materials below)

Patient Assessment Scenario

You will need two trauma boxes on the first day (two teaching stations). On the second day, you will need one for each patient assessment scenario station.

Each trauma box should contain the following:

Stethoscope	1

Blood pressure cuff	1
Pocket mask	1
4-inch elastic wrap (ACE)	4
6-inch elastic wrap (ACE)	2
Kerlix rolls	4
4 × 4 gauze pads (unsterile)	20
Wide adhesive tape	1 roll
One-inch adhesive tape	3 rolls
IV tubing	2 sets
Oxygen mask or nasal prongs	1

Miscellaneous

Clipboards	12
Pencils	30
Moulage kit (see Chapter 9)	1
Spray bottles with glycerin-water mix	3
Projector for PowerPoint slides	1–2

Pointer	1
Cloth towels	8
Wide adhesive tape	10 rolls
Blankets	2
Felt-tip pens (red and black)	2 ea.

Meals

ITLS is such an intensive learning course that convenient on-site lunches are desirable in order to save time. The advantages of on-site meals include the following:

1. They keep the students in contact with other students and faculty to foster the sharing of professional experience.

2. They keep the students in close proximity to the course for easier coordination.

3. They keep the amount of lost time to a minimum by eliminating students' waiting time and travel time.

The disadvantages of on-site meals are as follows:

1. Increased course registration fees to cover the cost of meals

2. Inability to satisfy everyone's gourmet tastes

On-site meals need to be cost-effective and simple. Allowing the students to wander to restaurants and stand in line to be served is a hindrance to course completion, but at times it is necessary. If you cannot provide on-site meals, you should provide specific directions or maps to

nearby restaurants.

Course Budget

One of the earliest tasks for the course coordinator is to establish the course budget. This needs to be one of the first considerations in planning a course because the course fee needs to be set early on. Several factors to be considered in a budget follow:

1. Site rental

2. Mailings – hard copy or electronic

    a. Precourse advertising

    b. Faculty invitation letters

    c. Faculty precourse mailings

    d. Student precourse mailings

    e. Student/faculty postcourse mailings

3. Student manuals

4. Lunches for students, faculty, and models

5. Coffee, beverages, and/or snacks during breaks for students, faculty, and models

6. Faculty stipends (if offered)

7. Faculty travel and lodging (if necessary to use out-of-town faculty)

8. Chapter/ITLS international assessment fees

9. Equipment

10. Miscellaneous

    a. Postage

    b. Photocopying

    c. Envelopes, paper, name tags, markers, and so on

Instructor-Ready Books

The following were developed by Leon Charpentier of Texas ITLS to help decrease the confusion in coordinating an ITLS course. The books are made in inexpensive three-ring binders. There is only one book per lecture, per skill station, and per testing scenario. Initially, building this bank of books takes a bit of work. You will need to do a lot of copying the first time you make them, but doing so will save you a lot of copying in future courses. You must keep track of these books, collecting and storing them between each course. However, it really pays off as you get ready for each course you coordinate.

Lecture Book: The following items are placed permanently in each lecture book:

1. A copy of the assigned lecture

2. Chapter objectives and key lecture points from Chapter 6 of the instructor's guide

3. Printout of PowerPoint slides or CD containing the PowerPoint slides for this lecture

4. Test questions from the assigned lecture

At the beginning of the book, the following items are changed per course:

1. The letter of what is expected from instructors

2. Location and map

3. Class schedule

Skill Station Book: The following items are placed permanently in each skill station book:

1. A copy of the skills criteria from the student manual

2. A copy of the skills criteria from the instructor's guide

3. A list of equipment required for that particular skill station

   At the beginning of the book, the following items are changed per course:

1. The letter of what is expected from instructors

2. Class schedule

Testing Scenario Book: The following are placed permanently in each testing scenario book:

1. Four copies of the scenario

   a. One for the instructor

   b. One for the moulage technician

   c. One for the model

   d. One to stay in the book if the others are lost

2. Twelve scenario testing check-off sheets (some prefer different-colored sheets for practice and testing)

   The books should be numbered 1 through 13 (or however many are chosen), corresponding to the scenario in the instructor's guide.

Some courses use a pop-up display of the ITLS survey as a teaching tool in the skill stations. A template is available from the ITLS international office.

Delegating Tasks

Staff support is needed in the following areas:

Correspondence: An efficient and organized course assistant is invaluable in this area. Several mailings and course rosters are involved. The assistant will create course rosters and send participant and faculty confirmation notices. There are also many schedules and rosters that must be sent to both faculty and students. The assistant must be proficient using the ITLS course management system (CMS).

Equipment manager: One person should be assigned the task of securing, organizing, cleaning and inventorying the equipment. This is especially true at the end of the course when everyone is tired and ready to go home. If one person does not take responsibility for getting equipment cleaned, repaired, packaged, and returned, there will be equipment missing.

Timekeeper during the skill stations: There is a very tight schedule during the skill stations. There are only 30 minutes in which to practice a skill, prepare the room for the next group, and mobilize the present group toward their next station. One person should be delegated to notify each instructor 5 minutes before the end of the teaching period. This person, usually the coordinator, should then notify each instructor when the period is over. Unless monitored closely, skill stations tend to run overtime, with resultant

schedule disruption and confusion.

Models: One person should be responsible for recruiting models for the skill stations (day one or two) and patient assessment (day two). This same person should coordinate makeup (moulage) of the models. Models should arrive at the course at least 2 hours ahead of time in order to have their makeup applied (unless you are going to use felt-tip pen moulage). Failure to do this will always result in a delay of the skills session and will ensure a late finish on the day.

Makeup (moulage): At least two people should be assigned the task of applying makeup and moulage to the models. They should be reminded that *simpler is better.* Complex moulage often falls off after the first session. The commercial rubber moulage is not as realistic but is very durable. Using a felt-tip pen to simply draw and label the injury (onto a piece of white tape that is stuck to the affected part) is also acceptable. The moulage coordinator should be prepared to make the rounds during the course to maintain the victims' moulage.

MASTER CHECKLIST

Precourse

Three Months Before the Course

1. Select the target group of students with the director.

2. Decide whether you are going to teach any optional material; if so, students and instructors must be notified early so they are prepared (see Frequently Asked Questions). As a general

rule, you should teach what is accepted technique in your area.

3. Select the site and date.

4. The course should be entered into the ITLS course management system (CMS).

5. Make initial faculty contact.

6. Establish a tentative budget for your course.

7. Once the course is approved, send invitations/brochures to the target group of students.

8. Appoint an equipment manager and together take an inventory of the on-site equipment. Determine the needed equipment from the lists in the skill stations and patient assessment stations. Make initial contact for outside sources of equipment.

98.   Visit the site and confirm dates. Order the menu for the meals, and arrange for refreshments at the breaks.

Two Months Before the Course

1. Reserve the faculty and staff hotel rooms in person to determine the adequacy of the accommodations. An evening meeting place at the hotel for the visiting faculty is advantageous. If lodging is some distance away from the course site, maps should be provided.

2. Order the student manuals.

3. Send faculty acknowledgment letters with course dates and reply cards for confirmation. To avoid misunderstanding, the introductory letter should state whether the faculty members are performing gratis, for reimbursement of expenses, or for a stated honorarium and reimbursement of some or all expenses.

4. Decide whether you wish to sell and distribute ITLS novelty items (T-shirts, pins, etc.). Either order the supplies through your chapter office or go to the ITLS bookstore at www.itrauma.org.

One Month Before the Course

1. Prepare the faculty roster and assignments.

2. Send faculty precourse letter. The following items should be sent to each faculty member:

   a. Acknowledgement letter

   b. A copy of the appropriate part of Chapter 3, Teaching Strategies: Guide for Instructors section of the instructor's guide (if your instructors do not have an instructor's guide)

   c. CD or printout of PowerPoint slides for scheduled lectures

   d. Agenda for lectures and practical sessions

   e. Location and floor plan of the facility where the course will be taught

   f. Faculty assignments for lecture, skill stations, and patient assessment stations

   g. Registration forms for hotel/motel accommodations (if applicable)

3. Confirm all hotel/motel reservations.

4. Enter student data into the CMS course roster as candidates apply.

5. Prepare and mail acknowledgments to registrants. Include a precourse study packet as follows:

   a. Student manual (unless the students have already purchased them).

b. Pretest and answer sheet.

c. Tentative course schedule with a list of any optional skills to be taught. Make it clear to the students that they do not have to be responsible for optional skills that are not to be covered in a particular course.

d. Map of course location that includes area hotels.

e. A copy of the Students' Guide to ITLS section of the instructor's guide (see Chapter 9) or a similar prepared handout.

6. Check the available equipment again with the equipment manager. Verify where the remainder of the equipment is to be obtained and who is transporting it.

7. Recruit models with the moulage coordinator.

Two Weeks Before the Course

1. Prepare the final candidate roster.

2. Meet with the course director to check the following:

a. Final schedule

b. Equipment

c. Facility

3. Prepare candidate packets:

a. Welcome letter

b. Group assignments

    c. Final agenda

    d. Rotation schedules

    e. Faculty roster—with work addresses (do not include home telephone numbers)

    f. Student roster—with work addresses (do not include home telephone numbers)

    g. Name tags

4. Make a final site visit:

    a. Confirm breaks and meals with caterers.

    b. Check rooming lists.

    c. Plan the layout of the rooms for skill stations and patient assessment stations.

    d. Make arrangements to open the doors at least two hours prior to the course in order to organize the equipment staging area and make the coffee.

5. Send confirmation letter to models. Specify clothing to wear, eating accommodations, reimbursement, meeting place, and times.

6. Photocopy the necessary pages from the instructor's guide to include:

    a. Pages relevant to each instructor's skill station.

    b. Pages relevant to each instructor's patient assessment station.

    c. Posttest and answer sheet for each student (with extras). This will come from the ITLS chapter office.

    d. Patient assessment grade sheets (10 to l5 copies for each station).

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e. Equipment list for each skill station and patient assessment station with the numbers of the skill station and patient assessment station to be taped to the door for the equipment manager.

f. The various forms (such as the course evaluation form).

7. If you plan to photograph the students for identification, have a digital camera available.

One Day Before the Course

1. Take all equipment to the staging area of the facility. Inventory and properly label it. Secure the area.

2. Set up, inventory, and check all audiovisual equipment. You need a laptop, projector and may need other items such as screen, 115-volt extension cord, remote control with extension, and microphone for soft-voiced speakers if the size of the room requires it.

3. At the precourse faculty meeting (usually the night prior to registration), give the faculty members their packets. Include an agenda, station locations, selected scenarios, assignments, and final roster. Review the game plan for the weekend, including the following:

a. Meals and meetings

b. Final agenda with changes noted

c. Student registrants, reviewing backgrounds (prehospital, nursing, industrial, military)

d. Plan for management of equipment

e. Skill stations

f. Grading criteria and retest policy for patient assessment

g. Ground rules for student team member roles

h. Plan for setting up skill stations and distribution of equipment

First Day of the Course

1. Arrive early with the equipment manager and moulage coordinator. Verify thermostat set-
tings, posting of outside signs, room assignments, equipment distribution, and model prepa-
ration; and make coffee.

2. Verify proper functioning of audiovisual equipment, and set up registration desk.

3. Register participants, and collect their pretests.

4. Take instant photographs, if possible, to assist in identifying students during the course and
at the closing faculty meeting. If a video camera is available, you may record each student on
a videotape and prepare a typed list of the students in the order in which they appear. At the
postcourse faculty meeting, the students should be discussed in the order that they appear on
the tape. If you decide to use one of these methods, please explain to the students that the on-
ly purpose of the photos or videos is to help the faculty identify the students.

5. Line up the lecturers; introduce the first speaker, make sure the second one is ready, and so
on. If a scheduled lecturer does not show up on time, you may substitute another lecture (it is
a good idea to ask all lecturers to be present at the beginning of the course) or have one of the
other faculty members give the scheduled lecture.

6. During the morning lecture session, the other faculty members should set up their skill sta-
tions and inventory their equipment. It is best to do this the night before, but providing
equipment security often prevents this.

7. Check to be sure that the models arrive in time to be moulaged before the patient assessment skill stations.

8. Have a brief faculty meeting to review goals and procedures before beginning the skill stations. This may be done during lunch, but it is better for the faculty to have lunch with the students. Students are much more likely to ask questions of the faculty at this time.

9. Assign someone to notify each instructor 5 minutes before the end of each skill station teaching period. This person should then notify each instructor when the period is over. You must keep the stations on time. Any station that runs over its scheduled time will back up the whole schedule.

10. Enlist the support of the faculty to tear down the skill stations and distribute the equipment to the patient assessment stations. Extra equipment should be stored in the equipment staging area. Maintaining equipment security may prevent you from distributing equipment until the second day.

Second Day of the Course

1. Arrive early with the equipment manager and moulage coordinator. Confirm the room assignments, verify the functioning of the audiovisual equipment, and make the coffee.

2. Greet the students, correct any registration deficiencies from the first day, and have the continuing education forms filled out, signed, and collected.

3. Line up the lecturers; introduce the first speaker, make sure the second one is ready, and so on.

4. Direct the moulage coordinator to take charge of the models and their moulage.

5. Have faculty members set up their patient assessment stations and inventory their equipment.

6. Verify that the written-examination room is set up with answer sheets and pencils. A monitor should be assigned to the room. The monitor should grade tests immediately.

7. Verify that the instructors close their stations for lunch and that food is brought to the models. A secluded classroom for the models is appropriate. Someone should be assigned to take refreshments to the models during the afternoon.

8. Set up a collection area during testing. Collect the patient assessment evaluations and collate them with the written tests and photographs.

9. Arrange with a testing instructor, student, and course director for the retest of students who fail their first practical test.

10. See that course evaluation forms are available for the students to fill out before they leave.

11. Pass out continuing education forms if not already done.

12. Direct the instructors and the equipment manager to break down the patient assessment stations. Bring all of the equipment to the staging area. The equipment manager should stay at the staging area to verify that the equipment, which is leaving the area, is going with the appropriate person. Borrowed equipment should be cleaned and repaired before returning.

13. Arrange for the postcourse faculty meeting:

    a. Have available the collated student records for the faculty to review.

    b. Appoint a recorder to document the results of the written exam, practical practice, practical test, practical retest (if any), and final faculty decision, using the form provided.

c. Collect comments from the faculty about the course and teaching material. How could they be improved?

d. Distribute the faculty stipends (if any).

e. Pay the models (unless other arrangements have been made).

14. Verify with the equipment manager that the equipment has been distributed to the appropriate departing faculty.

15. Prepare and distribute the following to those students who have waited in order to get their grades immediately:

a. Participant scores

b. ITLS cards and certificates

c. Letter of attendance (for students who failed the course)

One Day After the Course

Take a breather for a job well done.

One Week After the Course

1. Prepare and mail, if not distributed at the close of the course, the following:

a. Participant scores.

b. ITLS cards—It is your (and the chapter's) responsibility to see that the students get their cards in a timely manner. The day of the course is preferred, but when course fees have been paid, students must receive their cards within 30 days.

c. Letters of attendance (for students who failed the course).

d. Thank-you letter to faculty.

2. Check all invoices and bills prior to payment. Make a course financial statement.

3. Hold a staff critique.

4. Enter all course data into the ITLS course management system (CMS).

5. Remit course fees to the chapter office.   In some chapters, course coordinators are not au-

thorized to print ITLS cards until fees have been paid.

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5. Inventory, clean, repair, and return all equipment to the proper local facilities. Thank all in-

dividuals who provided support for the course.

SKILL STATION 1

BASIC AND ADVANCED

AIRWAY MANAGEMENT

SKILL STATION 2

SHORT SMR DEVICES

EMERGENCY RESCUE

AND RAPID EXTRICATION

SKILL STATION 3

TRACTION SPLINTS

SKILL STATION 4

HELMET MANAGEMENT

LOG ROLL

LONG BACKBOARD

SKILL STATION 5

CHEST DECOMPRESSION

FLUID RESUSCITATION

SKILL STATION 6

PATIENT ASSESSMENT

AND MANAGEMENT

SKILL STATION 7

PATIENT ASSESSMENT

AND MANAGEMENT

TESTING STATION

1

TESTING STATION

2

TESTING STATION

3

TESTING STATION

4

TESTING STATION

5

TESTING STATION

6

International Trauma Life Support

TESTING STATION

7

TESTING STATION

8

TESTING STATION

9

TESTING STATION

10

3

Teaching Strategies: Guide for Instructors

ROLES AND RESPONSIBILITIES

The original Hippocratic Oath required the medical practitioner to swear to teach the art of medicine to others. This concept is still very important. Medicine is not just a trade or craft; it is an art, and we as practitioners must give something back to the art to continue to improve it. Teaching is a wonderful way to accomplish this. Teaching is extremely important in that our influence may pass from generation to generation, doing good or harm long after we are gone. Donating our precious off time to teach others how to save lives is one of the highest traditions of medicine.

ITLS instructors are responsible for knowing all of the ITLS material in order to present their assigned topic in a simple and easy-to-understand manner so that it ties in with the other parts of the ITLS method. It is just as important, whenever possible, for the instructors to remain available to the students for the purpose of answering questions and providing individual help. This includes eating and socializing with the students. Often, students will not ask the questions they really want to ask until they know the instructor and feel confident that the instructor will not ridicule them. It is understood that there will be times that the instructors can be present only long enough to present their material, but, if at all possible, the instructors should be present for the entire course.

The ITLS curriculum is based upon the best available scientific evidence regarding the care of the trauma patient. Not every aspect of trauma care is supported by such evidence. When there is none available, ITLS relies on a consensus reached among trauma care professionals and educators from around the globe to guide care in those areas. The materials used in the course are reviewed regularly by the ITLS Editorial Board and updates and changes are made regularly to reflect the best practices in trauma care.

It is extremely important that when teaching the course, the instructor should teach the principles of patient assessment and management set forth by ITLS. If one teaches material that is in conflict with the text, the students may become confused. If you have concerns about the material, please contact your chapter affiliate faculty or chapter medical director. Please do not engage in debate about the course content during the course. If you do not agree with the material and approach put forth by ITLS, please do not agree to teach. Please do contact your chapter medical director with your concerns.

The goal of every ITLS instructor is to teach the student skills and knowledge to provide the best possible prehospital trauma care.

TEACHING METHODOLOGY

Learning is a relatively permanent change in behavior that comes about as a result of a planned experience. Teaching is a method of attaining this desired change. We are involved in teaching adults, many of whom are already practicing as EMTs or nurses. There is now a generational difference in how our students like to receive their materials. While older students may do better with the classic lecture format, many younger students are visual in their learning style and more

technology focused. Regardless of their preferred style, to gain students' cooperation in the learning process, we must:

1. Convince them that there is a gap between the level at which they wish to perform and the level at which they are actually performing.

2. Help them to attain the desired level of performance.

To accomplish this, the learner must accept the performance goals as personal goals and must also accept a share of the responsibility for attaining those goals. This is all just a way of saying that it is almost impossible to teach something to someone who does not feel the need to know the material. Good instructors not only must know the material and how to explain it but also must be able to "sell" the "need to know" to the student. ITLS instructors should accept the philosophy that they are a team with the student, and their goal is to help every student attain the desired level of performance before the course is over. The practice of medicine is unique in that poor performance does not just lead to a poor product; it may result in the loss of life. We should consider our students as family and be willing to go the extra mile to help them learn. The instructor who takes pride in how many students fail has no business being in medicine or education.

Effective Teachers

1. Are polite

2. Are pleasant in their interactions

3. Call students by name

4. Give praise and positive feedback

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5. Involve students in decision making

6. Do not ignore, belittle, or harass students

7. Make reasonable demands on students

8. Are businesslike and warm

9. Are knowledgeable about their subject

10. Use gestures and movement (are not "stiff")

11. Make few errors

In general, lectures are effective ways to transfer information but alone are less effective for ensuring long-term retention. Hands-on practice with a caring, interactive instructor is one of the best ways to ensure retention. Therefore, lectures must be succinct, to the point, and as free as possible of incorrect information. If the lecture runs over its appointed time frame, there is probably information presented that will not be remembered anyway.

Learning proceeds most smoothly when material is somewhat new or challenging yet relatively easy for the students to relate to their existing knowledge.

PRESENTATION OF LECTURES

- **Make a good opening.** Use the opening to tell the students what you are going to discuss, why it is important to them, and what they should learn from the lecture.

- **Make a good presentation of the material.**

  o Avoid reading (slides or notes) or reciting; it is boring, and students will retain only

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50% even with the best audiovisual aids

o   Use a variety of styles (questions, thought-provoking statements, etc.) when you lecture:

- What are the ABCs of trauma?

- If a negative pressure inside the thorax accomplishes inspiration, what will happen if there is a gaping hole in the thorax?

- If shock causes this catecholamine response, what symptoms should we look for in the shocky patient?

- Why do we no longer hyperventilate the head injury patient?

- What injuries would you expect in this patient who was just struck from the passenger's side?

o   Highlight the important points in your opening and closing remarks: "This is what we are going to discuss . . . this is what we are saying . . . this is what we just discussed."

o   Relate the (action) slides to your experiences and the experiences of the students:

- This is the picture of the ankle of the man we picked up last week.

- This is the sequence of slides of the fire truck crash in Port Huron shortly before we visited there.

- This chest X-ray shows an injury just like the one in the patient you brought to the hospital last week.

o   Do not try to cover too many points. Teach key concepts.

- **Make a good closing.** Review the objectives that you outlined in your opening. Briefly bring everything together in a way that relates to those objectives.

IMPORTANT LECTURE PRESENTATION TOOLS

- Eye contact:

    o Read your audience—get feedback.

    o Identify three to five students near the corners of the class and talk to them.

    o Occasionally speak to people who are not paying attention.

- Movement:

    o Do not get stuck behind the podium or audiovisual equipment.

    o Moving leisurely around the room keeps the students' attention, especially when getting close to them.

    o Avoid distracting the class with pacing, repetitive movements, or inappropriate wardrobe; they may spend more time looking at what you are doing or wearing than listening to what you are saying.

- Voice:

    o Avoid distractive, repetitive words ("uh," "y'know," "well," "OK").

    o Vary your voice tone, volume, and speed.

    o Communicate important points by emphasizing with voice quality.

Help the students pass the course.

SKILL STATIONS

Objective

Acquisition of the psychomotor skills necessary for the rapid assessment and treatment of the multiple traumatized patient.

To Prepare

The skill stations are the heart of the course. Time should be used efficiently so that every student can become proficient in the procedures. The instructors must rehearse the station well, including with the model, if appropriate. The instructor must learn what equipment is needed and see that it is available and set up correctly beforehand. There are many optional skills included in the instructor's guide. The students should be notified well in advance of the course which skills will be taught (see the section in Chapter 2 titled "What Must Be Taught in an ITLS Course").

First review the skill station from the student's perspective by reading the individual skill station in the student manual. Next review the skill station from the instructor's perspective in Chapter 6 of the instructor's guide. Do this before the course so that on the day of the course you can use your time setting up and practicing your station.

Use the skill station as a complement to the lectures and not to repeat the information already presented. Use the skill station as a preparatory step to the patient assessment stations by explaining what is to be expected of students in the application of the skills they are reviewing or learning. It is imperative that the instructor knows the content of the patient assessment stations.

Presenting a Skill Station

- Do not lecture at the skill station.

- Do present the objectives of the skill station.

- Demonstrate the skill and talk through the skill, have the students talk through the skill, and then have the students practice the skill to their and your satisfaction.

- Encourage comments and questions about the procedure while students are busy practicing the skill.

- Remain flexible. Offer comments and feedback in a caring and constructive fashion. Do not embarrass the student who has difficulty with the skill being taught.

- If there are two instructors at your station, predetermine and coordinate your expectations.

- Allow as much time as possible for extra practice. Encourage the students to return at the end of the day if necessary. Give/offer extra help to those who may need it.

Help the students pass the course.

PATIENT ASSESSMENT SCENARIO PRACTICE AND TESTING

The ability to assess and manage trauma patients rapidly is the goal of the ITLS course. This time of practice, teaching, and then testing is extremely important.

1. Review teaching methodology.

2. Familiarize yourself with what the members of the team are allowed to do during practice and testing. Review the section titled "How to Function as a Team" (Chapter 9).

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3. Review Chapters 2 and 3 in the student manual.

4. During the practice-teaching portion, use the full time allowed. Allow the students to proceed with as little interruption or prompting as possible. When they have finished, quickly critique their performance, show them how to do it correctly, and then allow them to practice as time permits. Take into account local law and protocol.

5. During the testing portion you should not teach or prompt, and you should not discuss the scenario when the student finishes. Any questions are to be answered after the postcourse faculty meeting. As soon as one team finishes its test, you should immediately prepare for the next team's testing. It is a long session; you must keep things moving.

6. You need two instructors for each assessment station. One instructor cannot interact with the team and grade at the same time. One instructor should present the patient scenario and interact with the team. The other instructor should keep times and fill out the grade sheet. When the practice or test is over, the two instructors should discuss the performance and assign a grade.

7. Fill out the grade sheet:

   a. Write the team leader's name and the scenario number at the top.

   b. Mark whether it is a practice or test.

   c. Record the pertinent times as indicated.

   d. Check off each step as the team performs the assessment. Make pertinent notes and comments about problems or techniques (good and bad). Do not record unkind or jesting remarks; the students are allowed to review their grade sheets.

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e. Review the critical actions; determine an overall grade, and document why the student received that grade.

f. Sign the grade sheet. It is important at the postcourse faculty meeting to know who graded each student (final grades may be raised on the basis of practice performance).

HOW TO PRESENT THE SCENARIO TO THE STUDENT

1. The scenario should be presented in the hall outside the room so that the scene does not distract the students.

2. Have the students introduce themselves and give their profession, level of training, and type of work. Use the appropriate setting (prehospital, nursing, occupational health/industrial, military) based on the students' background and work setting.

3. Remind students that they have medical direction available on the radio.

4. Remind students that this is an interactive scenario and that they must tell the instructor everything that they are doing, or you will assume that it was not done.

5. Ask students whether they have any questions.

6. Dispatch the call as it would be dispatched in a real situation.

TEACHING VERSUS TESTING FORMATS

Teaching	*Testing*
Interact without obstructing education.	Interact for vital signs and medical direction

only.

Imprint the ITLS method, but do not inter-
rupt so often that you obstruct the learning
process.

Reinforce the team concept.   Continue the team concept during testing.

Allow a longer time for each station.   Allow a shorter time for each station.

Remind and guide students to: Avoid reminding students about patient care.

•Perform ongoing exam if patient worsens   Test only!
  (and every 5 minutes during transport).
                                                Do not teach!

                                                Do not prompt!

•Address critical care aspects.

•Splint all fractures, dress all wounds at the   You must remain objective and consistent for
  appropriate time.   all testing scenarios.

•Do a detailed exam.

•Call medical direction.

Patient Assessment Scenarios

Grading is done by way of individual grade sheets. The generic grade sheets have every step of

the assessment listed in an acceptable order followed by common critical actions and grading

criteria. There is room for some variation in the order of the steps listed on the grade sheet. Do

not become excessively rigid in this grading; no one (including you) will perform assessment exactly as listed on the grade sheet. You must look at the overall performance of the team leader as well as how well the team members assist and then assign a grade, taking into account the listed grading criteria and critical actions. It is important to write notes on the grade sheet to justify the grade that you assign, especially if you fail the student. Remember that patient assessment grading is subjective. If you become excessively rigid, no one will do well. You must look at the overall performance, not each individual action, when assigning a grade.

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Case Scenarios: Teaching and Evaluation Stations

You may choose any of these patient assessment scenarios, or you may make up your own scenarios. If you make up your own scenarios, please send ITLS International copies, as it may want to include them in the next *Coordinator and Instructor Guide*. <mark>A Scenario Development Sheet is included at the end of this chapter to assist you in completing new scenarios.</mark>

Because the Glasgow coma scale (GCS) score is now used in patient assessment, you must provide a copy of the GCS for the students to use when they practice and test (they are not expected to memorize it). A copy of the GCS is included at the end of Chapter 9. You may photocopy it and provide copies for your students to use during patient assessment.

While preparing for the station, spend time with the model who will be acting as the patient. Make sure models understand that they will be required to submit to being examined, handled, extricated, splinted, and strapped for several hours. Direct them to the furnished old clothes or verify that they are wearing clothes that they do not mind having ruined. Verify that female models are wearing bathing suits or other suitable attire under their clothes. Consider the weight and age of the model for the scenario. Models that are too heavy may cause injuries to your students, and models that are too young may have too short an attention span to last through the scenario. If necessary, select a different scenario or ask the course coordinator to assign a different model to the scenario.

Review the setting, injuries, and patient instructions with the models. Discuss the level of

"acting" you want them to display in their role as patients. Do they have any medical knowledge? If not, briefly explain the injuries so they better understand the behavior they should exhibit. Explain the history information, and give directions on how and when they are to provide the information. Agree on a signal that you will give them if you want a change in their behavior during the scenario (e.g., become unresponsive). Let them know that you may interject information into their performance if they forget anything or if there is an unexpected change in the scenario development.

Learning should easily transfer to real-life actions. Before you begin, make sure that all of the equipment required for your scenario is available in the station. Four settings are provided for each patient assessment scenario. Select the most appropriate setting for the team leader in your student group. To facilitate learning, please ensure that the scenario is as realistic as possible.

It is imperative that you review and memorize the information relevant to the scenario you will be delivering. You need to respond quickly to student actions and requests for information to maximize the learning experience and minimize assessment time.

SCENARIO 1

Setting

EMS/Prehospital A young male was struck near the pit area at a car racetrack. He is found lying semiprone at the side of the track.

Nursing/Medical A young male was struck near the pit area at a car racetrack. You are staffing the medical tent at the race and arrive to find the patient lying semiprone at the side of the track.

Occupational Health/Industrial A young male fell off a loading dock and was run over by a truck as it was backing into the dock. He is found lying semiprone by the dock.

Military The patient is a young male soldier who was dared by fellow soldiers to sprint across a busy road before traffic approached. He is found lying semiprone at the side of the road.

History

 S—"I can't breathe. My chest and leg hurt."

 A—allergic to penicillin

 M—insulin

 P—diabetes

 L—does not remember

 E—"He drove right over me!"

Injuries

1. Tension pneumothorax on left side
2. Intra-abdominal bleeding
3. Fracture of the left femur
4. Scalp laceration
5. Hypoglycemia

Patient Instructions

You should be confused and disoriented. You are having difficulty breathing. Complain of pain when your abdomen is palpated or your left chest or upper left leg is examined.

Moulage Instructions

Apply contusions and abrasions on left chest and abdomen. Use trousers with a large tear in left thigh area. The left thigh should have a large bruise, or write "fractured femur" on a piece of white tape with a felt-tip pen and apply it to the left thigh. Apply some fake blood to an area of the scalp (fake blood mixed with K-Y Jelly works well here—do not use this on light-colored hair, as it will stain the hair). Simulate diaphoresis.

Instructor Information

Scene size-up—no danger, mechanism as described, no other patients

Initial assessment

    General impression—potential for critical injuries

    LOC—responds to verbal stimuli but is confused

    Airway—clear and open

    Breathing—rapid with poor movement of air

    Ventilation instructions—should order oxygen and ventilatory assistance

    Circulation

        Pulses—present at the wrist, rapid

        Bleeding—blood in hair, no major bleeding

        Skin color, condition, and temperature—cyanotic, clammy, and cool

Decision—rapid trauma survey due to mechanism and initial assessment

Rapid trauma survey

    Head—blood in hair, no active bleeding, no other wounds noted

    Neck—no DCAP-BTLS

        Trachea—possible slight deviation to the right

        Neck veins—distended

    Chest

        Looking—contusions of left chest, no paradoxical movement

        Feeling—some crepitation and tenderness

        Listening—decreased breath sounds on the left; heart sounds—present but difficult to hear

        Percussion—hyperresonant on the left

    Abdomen—tender to palpation, slightly distended

    Pelvis—no DCAP-BTLS

Extremities

    Upper legs—swelling, tenderness, deformity of left upper leg, normal PMS

    Scan of lower legs and arms—no injuries noted

Exam of posterior—no DCAP-BTLS

Decision—load and go, consider immediate decompression of tension pneumothorax, splint left femur when in ambulance, two IV lines

History (obtain from the patient)

Vital signs—BP 80/50, pulse 150, respiration 36, temperature feels cool

Neurological

    LOC—confused and abusive, will not follow commands

    Pupils—equal and reactive

    Sensory—normal

    Motor—normal

    GCS—(13) eyes—open spontaneously (4), verbal—confused (4), motor—localizes to pain (5)

Ongoing exam

Subjective changes—if given glucose, patient feels better now

Neurological

    LOC—improved, almost normal if glucose has been given; no change if glucose not given

    Pupils—equal and reactive

    GCS—(15) eyes (4), verbal (5), motor (6)

Airway—open and clear

Breathing—rate 30, much better movement of air if tension decompressed

Circulation

    Blood pressure—110/70 if decompression and fluid bolus

    Pulses—rate 110

    Skin color, condition, and temperature—pale, cool, and diaphoretic

Neck—no change

    Trachea—midline

    Neck veins—flat

Chest—unchanged, heart sounds—normal

Abdomen—more distended, more tender

Focused assessment of injuries

    Scalp—no further bleeding

    Pneumothorax—as above

    Abdomen—as above

    Left femur fracture—good PMS

    Hypoglycemia—should be resolved

Check interventions

    Is oxygen hooked up and turned on?

    Decompression needle still patent?

    Are IVs running? Rate?

    Traction splint on left leg? PMS still OK?

    Cardiac monitor applied?

    Pulse oximeter applied? 92% saturation

    Dressing to scalp

Secondary survey (should be done after transport)

    History and vital signs (after decompression)—BP 100/60, pulse 110, respiration 30

    Neurological (after decompression)

        LOC—still confused and abusive, will not follow commands

        Pupils—unchanged

        Sensory—normal

        Motor—normal

        GCS—unchanged

        Finger-stick glucose—40 (if glucose is given, LOC improves to near normal)

    Head—blood in hair from scalp laceration, no Battle's sign or raccoon eyes, face shows no signs of trauma, no drainage from ears or nose

    Airway—open and clear

    Breathing—improved movement of air if tension pneumothorax has been decompressed; otherwise, worsening respiration

    Neck—no DCAP-BTLS

        Trachea—midline if tension pneumothorax decompressed

        Neck veins—flat if tension pneumothorax decompressed

Circulation—BP still 100/60; skin pale, cool, clammy

Chest

    Looking—contusions of left chest, no paradoxical movement

    Feeling—no instability, some crepitation and tenderness

    Listening—decreased breath sounds on the left; heart sounds—easier to hear now

    Percussion—no longer hyperresonant on the left if decompressed

Abdomen—more distended, more tender

Pelvis—do not examine again

Extremities

    Upper—no injuries noted, good PMS

    Lower—should have left leg in traction splint, good PMS

SCENARIO 2

Setting

EMS/Prehospital The team is called to a laboratory where an explosion has taken place. The male patient is just inside the door about 10 yards/9 meters from active burning. What is left of his shirt is smoldering.

History

    S—"I can't feel anything from the neck down. My mouth and nose burn."

    A—no allergies

    M—no medications

    P—no history of serious illness

    L—last meal 6 hours ago

    E—"I had just entered the lab when an explosion threw me across the room."

Nursing/Medical EMS was called to a laboratory where an explosion has taken place. The male patient is just inside the door about 10 yards/9 meters from active burning. EMS is transporting and will arrive in 10 minutes.

History

    S—"I can't feel anything from the neck down. My mouth and nose burn."

    A—no allergies

    M—no medications

    P—no history of serious illness

    L—last meal 6 hours ago

    E— "I had just entered the lab when an explosion threw me across the room."

Occupational Health/Industrial The team is called to a laboratory where an explosion has taken place. The male patient is just inside the door about 10 yards/9 meters from active burning. What is left of his shirt is smoldering.

History

    S—"I can't feel anything from the neck down. My mouth and nose burn."

    A—no allergies

    M—no medications

    P—no history of serious illness

    L—last meal 6 hours ago

    E—"I had just entered the lab when an explosion threw me across the room."

Military You are in a battle zone and are called to the scene of a helicopter that has been hit by a rocket. The helicopter crashed and is burning. The door gunner was thrown clear.

History

S—"I can't feel anything from the neck down. My mouth and nose burn."

A—no allergies

M—no medications

P—no history of serious illness

L—last meal 6 hours ago

E—"We were coming in to land and everything exploded."

Injuries

1. Second- and third-degree burns of face, anterior chest, and both arms
2. Upper airway burns
3. Open fracture of left forearm
4. Cervical-spine injury
5. Spinal shock

Patient Instructions

You should be found crumpled in an awkward position, alert, complaining in a hoarse voice that you cannot move. Complain that your mouth and nose are burning. Partway through the assessment, start yelling, "Get me out of here. I can't breathe!" Thereafter, rapidly lose consciousness and respond only to painful stimuli.

Moulage Instructions

Apply burn moulage to face, chest, and arms. Apply commercial open fracture moulage to the left forearm, or write "broken arm" on a piece of white tape with a felt-tip pen and apply it to the left forearm. A tiny bit of charcoal on the tongue will simulate intra-oral burns.

Instructor Information

Scene size-up—except for the nursing scenario, the scene is unsafe, with fire and smoke present. The military scenario has the added danger of being fired upon. Mechanism is explosion and burns. There are no other live patients.

Initial assessment

General impression—potential for critical injuries

LOC—alert

Airway—open, burns in mouth and nose

Breathing—normal rate and quality

Ventilation instructions—give oxygen

Circulation

> **Pulses**—present at the wrist, rate seems normal
>
> **Bleeding**—no active bleeding
>
> **Skin color, condition, and temperature**—burns of face, chest, and arms; otherwise, normal color, warm, dry

Decision—rapid trauma survey due to mechanism and facial burns

Rapid trauma survey

> **Head**—scalp normal, burns of face with singed hairs in the nose and burns inside the mouth
>
> **Neck**—no DCAP-BLTS, blistering burns of the anterior neck
>
> > **Trachea**—midline
> >
> > **Neck veins**—flat
>
> **Chest**
>
> > **Looking**—burns present on anterior chest, no movement of ribs during breathing
> >
> > **Feeling**—no crepitation, no tenderness, no sensation, no instability
> >
> > **Listening**—breath sounds bilateral and equal, heart sounds—normal
>
> **Abdomen**—soft, no tenderness, no sensation
>
> **Pelvis**—stable
>
> **Extremities**
>
> > **Upper legs**—no sign of trauma, no movement or sensation
> >
> > **Scan of lower legs and arms**—open fracture of left forearm, good pulse, no sensation or movement
>
> **Exam of posterior**—no sign of trauma, no sensation
>
> **Decision**—load and go, watch for airway compromise, cool burns and cover with clean sheet, splint forearm, two IV lines
>
> **History** (obtain from the patient)
>
> **Vital signs**—BP 70/40, pulse 65, respiration 16–18, temperature warm

Ongoing exam

> **Subjective changes**—patient cannot speak due to being intubated

Neurological

    LOC—awake, follows commands, cannot speak due to endotracheal tube (ET)

    Pupils—equal and reactive

    Sensory—unchanged

    Motor—unchanged

Airway—should be intubated; if not, severe stridor

Breathing—diaphragmatic but normal

Circulation

    Blood pressure—80/50

    Pulses—rate 65

    Skin color, condition, and temperature—warm and dry where not burned

Neck—no change

    Trachea—midline

    Neck veins—flat

Chest—clear bilaterally, heart sounds—normal

Abdomen—not distended, no sensation

Focused assessment of injuries

    Burns—unchanged

    Fracture of left forearm—still has good pulse

    Upper airway burns—should be intubated

    Cervical-spine injury—unchanged

    Spinal shock—unchanged

Check interventions

    Is oxygen hooked up and turned on?

    ET tube in correct position?

    Are IVs running and at correct rate?

    Splint in good position, pulse OK?

    Dressing on open fracture blood-soaked?

    Cardiac monitor applied?

    Pulse oximeter applied? 92% saturation

Secondary survey (should be done after transport)

History and vital signs—after fluid bolus: BP 76/50, pulse 65, respiration 16–18, temperature warm

Neurological

    LOC—normal

    Pupils—equal and reactive

    Sensory—none below the neck

    Motor—none below the neck, diaphragmatic breathing

Head—scalp normal, burns of mouth and inside nose, no drainage from nose or ears, no Battle's sign or raccoon eyes

Airway—swelling of the lips and mouth, stridor when breathing if not already intubated. If student attempts oral intubation, tell him or her that the patient is gagging too much to intubate. Student should explain to the patient why intubation is needed. May perform nasotracheal intubation or RSI.

Breathing—if intubated, rate 24; assistance not required

Neck—tender lower neck, can feel step-off

    Trachea—midline

    Neck veins—flat

Circulation—skin still warm and dry where not burned, no bleeding

Chest

    Looking—burns present on anterior chest, no movement of ribs during breathing

    Feeling—no crepitation, no tenderness, no sensation, no instability

    Listening—breath sounds bilateral and equal, heart sounds—normal

Abdomen—unchanged

Pelvis—no further exam

Extremities

    Upper—unchanged, good pulse

    Lower—unchanged, good pulse

Decision—intubate if not already done, fluid bolus, may use PASG, splint arm if not already done

SCENARIO 3

Setting

EMS/Prehospital The patient is a young male who is found in an alley. A police officer states that the patient is a known criminal who has been attacked. There is no other history available.

Nursing/Medical A young male is brought to the emergency department entrance and thrown out of a moving car. Your attending physician has gone to eat, and her beeper is not working.

Occupational Health/Industrial There has been a strike by the local union. There has been some violence and threats. Shots were heard, and the watchman found one of the employees lying in the parking lot. He appears to have been beaten and shot.

Military You are in a battlefield situation. You have been called to get an injured soldier who is in a foxhole following hand-to-hand combat.

History

Not available

Injuries

1. Closed head injury with dilated pupil on right

2. Fracture of left femur

3. Gunshot wound of left forearm and right leg

4. Stab wound of lower back

Patient Instructions

You should respond only to pain. During the rapid trauma survey and the secondary survey, you should withdraw to pain. During the ongoing exam, you should localize to pain.

Moulage Instructions

If you use the Med-E-Train™ mannequin, the injuries are already present except for the stab wound in the back. Use a red felt-tip pen to write "stab wound" on a piece of white tape. Place the tape on the patient's back. You may also use one of the Crash Kelly™–series mannequins for this scenario. If you use a live model, you will have to moulage the injuries or use the felt-tip pen and tape method.

Instructor Information

Scene size-up—the scene is safe in all of the scenarios except the military. The soldier will have to be moved to a safe place for evaluation. There are no other patients.

Initial assessment

    General impression—potential for critical injuries

    LOC—withdraws to pain

    Airway—open

    Breathing—rate slow, depth normal

    Ventilation instructions—assist ventilation with oxygen

    Circulation

        Pulses—rapid, present at the neck but not at the wrist

        Bleeding—from right ear, left forearm, right lower leg

        Skin color, condition, and temperature—pale, cool, clammy

Decision—rapid trauma survey due to mechanism and initial assessment

Rapid trauma survey

    Head—bleeding from right ear, Battle's sign on right, and several contusions of face and scalp

    Neck—no obvious injury

        Trachea—midline

        Neck veins—flat

    Chest

        Looking—no DCAP-BTLS

        Feeling—table, no crepitation

        Listening—breath sounds present and equal, heart sounds**—**normal

    Abdomen—no obvious injury

    Pelvis—stable

    Extremities

        Upper legs—displaced femur fracture on left, pulses present both legs

        Scan of lower legs and arms—bleeding gunshot wound of right lower leg and left forearm, pulses present

    Exam of posterior—stab wound of the back, still bleeding

    Decision—load and go (head injury, shock, abdominal injury), intubate, two IV lines, traction splint left femur, dressing to right leg and left arm and back

    History (unable to obtain)

Vital signs—BP 70 systolic, pulse 140, respiration 8, temperature cool and clammy

Neurological

    LOC—withdraws to pain

    Pupils—left 5 mm, right 8 mm; reaction to light: left normal, right sluggish

    Sensory—no response

    Motor—withdraws to pain

    GCS—(6) eyes—do not open (1), verbal—none (1), motor—withdraws to pain (4)

Ongoing exam

    Subjective changes—patient unconscious

    Neurological

        LOC—localizes to pain

        Pupils—unchanged from above

        GCS—(7) improved from above, eyes—do not open (1), verbal—none (1), motor—localizes to pain (5)

    Airway—should be intubated

    Breathing—rate 8/min when not ventilated; should be ventilated at a rate of 12–15 breaths/min

    Circulation

        Blood pressure—110/60 if IV fluids, 50 systolic if no fluids

        Pulses—rate 50–60

        Skin color, condition, and temperature—pale, cool, diaphoretic

    Neck—unchanged

        Trachea—midline

        Neck veins—flat

    Chest—unchanged, heart sounds—normal

    Abdomen—unchanged

    Focused assessment of injuries

        Closed head injury—still has drainage from ear and dilated pupil, LOC is slightly improved

        Fractured femur—still has pulse

        Gunshot wounds to forearm and leg—no further bleeding, still has pulse

        Stab wound of lower back—do not logroll just to check unless blood is running out from under the patient

Check interventions

Is oxygen hooked up and turned on?

Is the ET tube still in the trachea?

Are you ventilating at the correct rate?

Are IVs running at correct rate?

Is the leg still correctly splinted?

Are the dressings on arm and leg blood-soaked?

Is any blood coming from under the patient?

Cardiac monitor applied? Sinus bradycardia

Pulse oximeter applied? 98% saturation

Secondary survey (should be done after transport)

History and vital signs—after IV fluid bolus: BP 100/70, pulse 110, patient should be intubated and ventilated with 100% oxygen at a rate of about 12–15 breaths per minute

Neurological—unchanged from above

Head—multiple contusions, no blood or fluids from nose, blood coming from left ear, Battle's sign present on right

Airway—should be intubated

Breathing—should be assisting at rate of 12–15 breaths per minute (one breath every 5 seconds)

Neck—unchanged

Trachea—midline

Neck veins—flat

Circulation—bleeding should be controlled; skin pale, cool, clammy

Chest

Looking—no DCAP-BTLS

Feeling—stable, no crepitation

Listening—breath sounds present and equal, heart sounds—normal

Abdomen—unchanged

Pelvis—do not examine again

Extremities

Upper—should have dressing on wound, weak pulses

Lower—should have splint on left leg and dressing on right leg, weak pulses

SCENARIO 4

Setting

EMS/Prehospital There has been a head-on collision of a sports car with a power pole. The un-restrained driver is still in the vehicle.

Nursing/Medical A young adult male is brought to your emergency department in the backseat of a two-door car. He was found unconscious sitting behind the wheel of his car after colliding with a power pole. The steering wheel was broken, and the windshield was knocked out. The people who brought the patient in do not know him. Your attending physician is with a critical patient and cannot help you at this time.

Occupational Health/Industrial A truck loaded with crates backs into an employee, pinning him chest high against a concrete wall. The truck has been moved, and a forklift has lifted the crates to allow access to the patient.

Military There has been a head-on collision between a Humvee and a Bradley. The unrestrained driver is still in the Humvee.

History

Not available

Injuries

1. Sternal fracture
2. Myocardial contusion
3. Intra-abdominal bleeding
4. Concussion

Patient Instructions

Respond only to pain (localize). Moan with pain when your chest or abdomen is palpated.

Moulage Instructions

Apply contusions to the forehead and sternum (see moulage techniques in Chapter 9). Simulate shock.

Instructor Information

Scene size-up—for prehospital setting: power lines are down on the car. The gas tank has ruptured and is leaking. If students try to get the patient out of the car without calling the power company, tell them that they have been electrocuted and must start over. If they elect to call the power company, tell them that it has just arrived on the scene and has turned off the power and removed the lines. When the team members approach the vehicle (prehospital and military settings), tell them that the back of the vehicle has just burst into flames. If the team members do not extricate by the rapid emergency extrication method, tell them that they have all burned up and must start over. Nursing and industrial settings have safe scenes. There are no other patients.

Initial assessment

   General impression—potential for critical injuries

   LOC—does not respond to voice but localizes to pain

   Airway—open, gag reflex present

   Breathing—normal rate and depth

   Ventilation instructions—give oxygen, assist ventilation as needed

   Circulation

      Pulses—present at the wrist, seems a little fast

      Bleeding—no external bleeding noted

      Skin color, condition, and temperature—normal

   Decision—rapid trauma survey due to mechanism and exam

Rapid trauma survey

   Head—contusion of forehead

   Neck—no response to palpation, no injuries noted

      Trachea—midline

      Neck veins—flat

   Chest

      Looking—contusion over sternum, otherwise normal

      Feeling—crepitance over sternum and anterior ribs, moans with pain when sternum and anterior ribs are palpated

      Listening—breath sounds present and equal; heart sounds—normal, but slightly irregular

   Abdomen—distended and painful moans when palpated

   Pelvis—stable and nontender

   Extremities

      Upper legs—normal

Scan of lower legs and arms—normal

Exam of posterior—normal

Decision—load and go, two IV lines, monitor heart, monitor for need to intubate

History (unable to obtain)

Vital signs—BP 80/60, pulse 130, respiration 20, temperature normal

Neurological

    LOC—localizes to pain

    Pupils—5 mm, equal and reactive

    Sensory—localizes to pain

    Motor—moves all extremities to pain

    GCS—(8) eyes—open to pain (2), verbal—none (1), motor—localizes to pain (5)

Ongoing exam

    Subjective changes—patient unconscious

    Neurological

        LOC—unchanged

        Pupils—equal and reactive

        GCS—(8) eyes (2) , verbal (1), motor (5)

    Airway—open, no gag reflex, needs intubation

    Breathing—normal rate and depth

    Circulation

        Blood pressure—110/70

        Pulses—rate 110

        Skin color, condition, and temperature—pale, cold, clammy

    Neck—unchanged

        Trachea—midline

        Neck veins—flat

    Chest—unchanged; heart sounds—normal, but slightly irregular

    Abdomen—distended and tender

    Focused assessment of injuries

        Sternal fracture - unchanged

        Intra-abdominal bleeding - continues

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Blunt head trauma - unchanged

Check interventions

Is oxygen hooked up and turned on?

Is patient intubated and the tube in the trachea?

Are IVs running at correct rate?

Cardiac monitor applied?

Pulse oximeter applied? Multiple PVCs, 96% saturation

Secondary survey (should be done after transport)

History and vital signs—no history; vital signs after fluid bolus: 90/60, pulse 110, respiration 20

Neurological—unchanged from above

Head—contusion of forehead, no fluid from nose or ears, no Battle's sign or raccoon eyes, face stable

Airway—open, gag reflex still present

Breathing—normal rate and depth

Neck—no sign of trauma

Trachea—midline

Neck veins—flat

Circulation—BP as above; skin now pale, cool, clammy

Chest—no change; heart sounds—normal, but slightly irregular

Abdomen—more distended, patient moans and localizes to palpation

Pelvis—no need to examine again

Extremities

Upper—normal, weak distal pulses, moves to pain

Lower—normal, weak distal pulses, moves to pain

Decision—maintain IV fluids to keep BP in range of about 110 systolic; watch for loss of gag reflex—noncontrolled bleed BP maintenance of 100 systolic

SCENARIO 5

Setting

EMS/Prehospital Police request assistance at the scene of a murder/suicide. A male is confirmed dead from a gunshot to the head, while a female is lying supine and holding her arm.

History

    S—"I can't get my breath. It hurts to breathe. I think my arm is broken."

    A—allergic to tetanus toxoid

    M—none

    P—hemophilia

    L—3 hours ago

    E—"I tried to stop him from attacking me and he broke my arm; then he shot me!"

Nursing/Medical Police respond to the scene of a murder suicide. A male is confirmed dead from a gunshot to the head. Neighbors take a female to the nearby hospital before EMS arrives.

History

    S—"I can't get my breath. It hurts to breathe. I think my arm is broken."

    A—allergic to tetanus toxoid

    M—none

    P—hemophilia

    L—3 hours ago

    E—"I tried to stop him from attacking me and he broke my arm; then he shot me!"

Occupational Health/Industrial The husband of one of your workers has come to the plant, hit her with a bat, and shot her in the chest. He then shot himself in the head.

History

    S—"I can't get my breath. It hurts to breathe. I think my arm is broken."

    A—allergic to tetanus toxoid

    M—none

    P—negative for serious illness

L—3 hours ago

E—"I tried to stop him from attacking me and he broke my arm; then he shot me!"

Military You are on the front line and are called to rescue a soldier who has been injured by an explosion.

History

S—"I can't get my breath. It hurts to breathe. I think my arm is broken."

A—allergic to tetanus toxoid

M—none

P—negative for serious illness

L—3 hours ago

E—"A shell went off nearby and blew me up against this rock wall."

Injuries

1. Sucking chest wound on the right side
2. Fracture of left forearm
3. Hemothorax on right side
4. Shock

Patient Instructions

You are alert but have difficulty breathing and are in great pain. Cry out in pain when anyone touches your left arm.

Moulage Instructions

Sucking chest wound and bruises on the arm can be made as described in Chapter 9 on moulage techniques. As an alternative, you can simulate the injuries by placing white tape on the affected areas and writing the injury ("sucking chest wound" and "broken arm") with a felt-tip pen. Simulate shock.

Instructor Information

Scene size-up—**EMS/prehospital:** The police have secured the scene.

> **Nursing/medical:** Scene safe.
>
> **Industrial:** Scene safe.
>
> **Military:** The patient is behind a rock wall at this time. There are no other patients.

Initial assessment

General impression—potential for critical injuries

LOC—alert

Airway—open

Breathing—rapid rate, poor air movement

Ventilation instructions—assist ventilation with oxygen

Circulation

> **Pulses**—present at the wrist, rapid
>
> **Bleeding**—still bleeding from the chest wound
>
> **Skin color, condition, and temperature**—cyanotic, cold, and clammy

Decision—rapid trauma survey due to mechanism and exam

Rapid trauma survey

Head—no injury noted

Neck—no sign of trauma

> **Trachea**—midline
>
> **Neck veins**—flat

Chest

> **Looking**—sucking chest wound on right side, no paradoxical movement, no bruising
>
> **Feeling**—there is crepitation on the right side
>
> **Listening**—sucking chest wound on the right; no breath sounds on the right; heart sounds—normal, but difficult to hear because of the sucking wound
>
> **Percussion**—dull on right side

Abdomen—soft, nontender

Pelvis—stable and nontender

Extremities

> **Upper legs**—normal
>
> **Scan of lower legs and arms**—swelling, tenderness, deformity of left forearm

Exam of posterior—normal

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Decision—load and go, seal sucking chest wound, two IV lines

History (obtain from the patient)

Vital signs—BP90/60, pulse 130, respiration 36, temperature normal

Ongoing exam

Subjective changes—patient complains of severe chest pain and dyspnea

Neurological

LOC—alert

Pupils—equal and reactive

Sensory—normal

Motor—normal

Airway—open

Breathing—still having dyspnea; rapid, shallow respiration

Circulation

Blood pressure—80/60 in spite of fluid bolus

Pulses—rate 140

Skin color, condition, and temperature—pale, cool, clammy

Neck—unchanged

Trachea—midline

Neck veins—flat

Chest—unchanged, heart sounds—normal

Abdomen—soft and nontender

Focused assessment of injuries

Chest wound - sealed still dull on right

Shortness of breath - continues, even with oxygen

Left arm - should be splinted now still has normal PMS

Check interventions

Is oxygen hooked up and turned on?

Chest wound still sealed?

Are IVs running at the correct rate?

Chest dressing blood-soaked?

Splint in good position? PMS OK?

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Cardiac monitor applied? Sinus tachycardia

Pulse oximeter applied? 92% saturation

Decision—notify medical direction that the patient has a right hemothorax and is in shock

Secondary survey (should be done after transport)

History and vital signs—after fluid bolus: BP 100/60, pulse 120, respiration 36

Neurological

LOC—alert

Pupils—equal and reactive

Sensory—normal

Motor—normal

Head—normal

Airway—open, better movement of air if open wound is sealed

Breathing—labored but improved if wound is sealed

Neck—nontender

Trachea—midline

Neck veins—flat

Circulation—BP and pulse as above; skin cyanotic, cool, clammy

Chest—no breath sounds on right, dull to percussion, heart sounds—normal

Abdomen—soft and nontender

Pelvis—no need to reexamine

Extremities

Upper—unchanged, weak pulses, normal sensory and motor

Lower—unchanged, weak pulses, normal sensory and motor

SCENARIO 6

Setting

EMS/Prehospital The patient is an 18-year-old female unrestrained driver who was involved in a motor-vehicle collision. While traveling at approximately 60 miles/90 kilometers per hour, she went off the road and hit a tree head-on. She is still in the car.

History

> S—"My hip hurts so bad! My chest and stomach hurt, too!"
>
> A—allergic to penicillin
>
> M—taking vitamins and Dilantin
>
> P—history of epilepsy, 7 months pregnant
>
> L—last meal 2 hours ago
>
> E—"I was driving down the road and woke up like this. Maybe I had another seizure."

Nursing/Medical The patient is an 18-year-old female unrestrained driver who was involved in a motor-vehicle collision. While traveling at approximately 60 miles/90 kilometers per hour, she went off the road and hit a tree head-on. She was moved to another car by friends and transported to your location because they were afraid she might have the baby.

History

> S—"My hip hurts so bad! My chest and stomach hurt, too!"
>
> A—allergic to penicillin
>
> M—taking vitamins and Dilantin
>
> P—history of epilepsy, 7 months pregnant
>
> L—last meal 2 hours ago
>
> E—"I was driving down the road and woke up when my friends were moving me. Maybe I had another seizure."

Occupational Health/Industrial The patient is an 18-year-old female employee who was unrestrained in her car. She was exiting the road into the parking lot at the factory at approximately 60 miles/90 kilometers per hour and hit a tree head-on. She is still in the car.

History

S—"My hip hurts so bad! My chest and stomach hurt, too!"

A—allergic to penicillin

M—taking vitamins and Dilantin

P—history of epilepsy, 7 months pregnant

L—last meal 5 hours ago

E—"I was driving down the road and woke up like this. Maybe I had another seizure."

Military An 18-year-old female is the civilian daughter of the general. She was walking to her car after lunch at the officer's club when a truck struck her.

History

S—"My hip hurts so bad! My chest and stomach hurt, too!"

A—allergic to penicillin

M—taking vitamins and Dilantin

P—history of epilepsy, 7 months pregnant

L—last meal in the last hour

E—"I was walking to my car and woke up like this. I don't know what happened."

Injuries

1. Posterior dislocation of left hip
2. Fractured pelvis
3. Shock
4. Contusion of sternum

Patient Instructions

You should be alert and complain of pain in the chest, abdomen, and left hip. When examined, you should complain of pain when the sternum or anterior ribs are palpated, when the pelvis is palpated, or when the left leg is moved in any way. Do not allow your left leg to be straightened. Scream at the top of your lungs at any attempt to straighten your left leg. Continually say, "I am pregnant—what about my baby?"

Moulage Instructions

Apply bruise to the sternum. Use one pillow to simulate pregnancy (unless model is actually

pregnant). Simulate diaphoresis.

Instructor Information

Scene size-up—the scene is safe in all settings. Mechanism depends on the setting chosen. No other patients.

Initial assessment

    General impression—potential for serious injuries

    LOC—normal

    Airway—open

    Breathing—normal rate and quality

    Ventilation instructions—give supplemental oxygen

    Circulation

        Pulses—present at the wrist, rapid

        Bleeding—no external bleeding

        Skin color, condition, and temperature—good color, warm, dry

Decision—rapid trauma survey due to mechanism

Rapid trauma survey

    Head—no obvious injury

    Neck—normal, nontender

        Trachea—midline

        Neck veins—flat

    Chest

        Looking—contusion of sternum

        Feeling—tender sternum, no instability

        Listening—breath sounds present and equal, heart sounds—normal

    Abdomen—very pregnant (uterus to the xiphoid), tender

    Pelvis—tender, unstable

    Extremities

        Upper legs—left leg flexed at the hip and knee, internally rotated; right leg normal

        Scan of lower legs and arms—normal

    Exam of posterior—normal

    Decision—load and go (fractured pelvis), two IV lines, splint dislocated hip

History (obtain from the patient)

Vital signs—BP 90/60, pulse 140, respiration 24, temperature normal

Ongoing exam

Subjective changes—patient complains of increasing abdominal pain

Neurological

LOC—alert

Pupils—equal and reactive

Sensory—normal

Motor—normal

Airway—open

Breathing—normal

Circulation

Blood pressure—if no IV fluids: BP 60/40; if IV fluids: BP 100/60

Pulses—rate if no IV fluids: 160; if IV fluids: 110

Skin color, condition, and temperature—pale, cool, clammy

Neck—no change

Trachea—midline

Neck veins—flat

Chest—unchanged, heart sounds—normal

Abdomen—very tender

Focused assessment of injuries

Contusion of sternum—monitoring heart

Posterior dislocation of hip—splinted

Fractured pelvis—stabilized on spine board

Shock—fluid boluses

Check interventions

Is oxygen hooked up and turned on?

Hip splinted in flexed position?

Are IVs running at correct rate?

Patient on backboard tilted to the left?

Cardiac monitor applied? Sinus tachycardia

Pulse oximeter applied? 100% saturation

Secondary survey (should be done after transport)

History and vital signs—if given a bolus of IV fluids: BP is 100/70, pulse 110, respiration 24

Neurological

LOC—alert and oriented

Pupils—equal and reactive

Sensory—normal

Motor—normal

Head—normal, no fluid from ears or nose

Airway—open

Breathing—normal rate and quality

Neck—no tenderness or sign of trauma

Trachea—midline

Neck veins—flat

Circulation—no external bleeding, skin pale, cool, diaphoretic

Chest

Looking—unchanged

Feeling—sternal and anterior rib tenderness

Listening—breath sounds still present and equal, heart sounds—normal

Abdomen—more tender

Pelvis—do not examine again

Extremities

Upper—normal

Lower—unchanged from above, weak distal pulses, normal sensation, you cannot straighten left hip

SCENARIO 7

Setting

EMS/Prehospital A 30-year-old male involved with road construction falls into a rock-crushing machine. Coworkers stop the machine, pull him out, and lay him on the side of the road.

History

    S—patient unresponsive

    A—none

    M—none

    P—diabetic

    L—last meal 4 hours ago

    E—"The supervisor saw him fall in and yelled for someone to stop the machine, but he was already badly hurt!"

Nursing/Medical A 30-year-old male involved with road construction falls into a rock-crushing machine. Coworkers stop the machine, pull him out, and transport him in the box of a dump truck to your facility.

History

    S—patient unresponsive

    A—none

    M—none

    P—diabetic

    L—last meal 4 hours ago

E—"The supervisor saw him fall in and yelled for someone to stop the machine, but he was already badly hurt!"

Occupational Health/Industrial A 30-year-old male involved with road construction falls into a rock-crushing machine. Coworkers stop the machine, pull him out, and lay him on the side of the road.

History

S—patient unresponsive

A—none

M—none

P—diabetic

L—last meal 4 hours ago

E—"The supervisor saw him fall in and yelled for someone to stop the machine, but he was already badly hurt!"

Military Soldiers were involved in minesweeping operations when a mine exploded, leaving one soldier badly injured and another with skin abrasions.

History

Not available.

Injuries

1. Basilar skull fracture on the right side

2. Both legs crushed and mangled

3. Fractured pelvis

4. Large laceration of abdomen with protruding viscera

Patient Instructions

The patient remains unresponsive.

Moulage Instructions

You may use a live model, but any mannequin, including a Resusci Anne™, can be used. The protruding viscera can best be simulated with commercial strap-on moulage, but it can be made (see makeup techniques in Chapter 9). Bleeding from the legs can best be simulated with red paper or cloth on which "active bleeding" is written with a felt-tip pen. The closed fracture of the skull can best be made by moulaging a Battle's sign behind the right ear. Put some glycerin or artificial blood in the right ear to represent spinal fluid or blood draining from the ear.

Instructor Information

Scene size-up—the scene is now safe in all settings except the military setting, in which you must be concerned about stepping on another mine. There are no other patients.

Initial assessment

    General impression—critical situation

    LOC—localizes to pain

    Airway—open

    Breathing—normal depth of respiration; the rate seems slow

    Ventilation instructions—should give 100% oxygen and assist ventilation at a rate of 12–15 breaths per minute

    Circulation

        Pulses—present at the neck but not at the wrist, rapid

        Bleeding—from both legs and abdominal wound

        Skin color, condition, and temperature—pale, cold, clammy

    Decision—rapid trauma survey due to mechanism and exam

    Rapid trauma survey

        Head—bruising to right side of face, bloody fluid from right ear

        Neck—no obvious trauma

            Trachea—midline

            Neck veins—flat

        Chest

            Looking—no obvious injury

            Feeling—no TIC

            Listening—breath sounds present and equal bilaterally, heart sounds—normal

        Abdomen—protruding viscera, bleeding

        Pelvis—very unstable

        Extremities

            Upper legs—both legs crushed and mangled from the upper thighs down to the feet; there is continued bleeding from both legs

            Scan of lower legs and arms—arms no apparent injuries, legs as above

        Exam of posterior—abrasions on lower back

        Decision—load and go, cover protruding viscera, pressure dressing to stop bleeding from legs, two IV lines, monitor for need to intubate, check finger-stick glucose (120)

        History (unobtainable)

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Vital signs—BP 50/0, pulse 160, respiration slow when not assisting, temperature normal

Neurological

LOC—localizes to pain

Pupils—right dilated and nonreactive, left midposition and reactive

Sensory—localizes to pain

Motor—moves arms well, little movement in legs

GCS—(8) eyes—opens to pain (2), verbal—none (1), motor—localizes to pain (5)

Ongoing exam

Subjective changes—patient unconscious

Neurological

LOC—unchanged

Pupils—unchanged

Sensory—unchanged

Motor—unchanged

GCS—(8) eyes (2), verbal (1), motor (5)

Airway—should be intubated

Breathing—should be assisted at 12–15 breaths per minute

Circulation

Blood pressure—110/70

Pulses—rate 130

Skin color, condition, and temperature—pale, cool, clammy

Neck—unchanged

Trachea—midline

Neck veins—flat

Chest—unchanged, heart sounds still easily heard

Abdomen—unchanged

Focused assessment of injuries

Basilar skull fracture—still some drainage from the ear, still only localizes to pain, pupils unchanged

Abdomen—no further bleeding if properly dressed

Pelvis—no further exam

Legs—bleeding stopped by tourniquets, unable to splint due to extent of the injuries

Check interventions

Is oxygen hooked up and turned on?

ET tube in the trachea?

Ventilation rate correct?

Are IVs running at the correct rate?

Dressings blood-soaked?

Tourniquets still are controlling the bleeding?

Cardiac monitor applied?

Pulse oximeter applied? 98% saturation

Secondary survey (should be done after transport)

History and vital signs—after fluid bolus: BP 70/50, pulse 130, respiration still slow when not assisting

Neurological

LOC—localizes to pain

Pupils—right dilated and nonreactive, left midposition and reactive

Sensory—localizes to pain

Motor—moves arms well, little movement in legs

GCS—(8) eyes—opens to pain (2), verbal—none (1), motor—localizes to pain (5)

Head—Battle's sign behind right ear, bloody fluid from right ear, face stable, no drainage from the nose

Airway—open, no gag reflex, should be intubated

Breathing—slow and deep when not assisted

Neck—unchanged

Trachea—midline

Neck veins—flat

Circulation

BP—90/60 if fluids going, 50/0 if not

Pulse—130 if fluids going, 160 if not

Skin color, condition, and temperature—pale, cool, clammy

Chest—unchanged, heart sounds still easily heard

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Abdomen—bleeding controlled with dressings

Pelvis—do not examine again

Extremities

    Upper—normal

    Lower—continue to bleed unless tourniquets applied

Decision—tourniquets to legs, give fluids to get BP to 110 systolic, intubate

SCENARIO 8

Setting

EMS/Prehospital Two teenagers were riding a four-wheeled all-terrain vehicle. The driver was a 16-year-old female, who drove a four-wheeler into a tree. The driver was killed instantly. The passenger, a 14-year-old male, was thrown into a ditch. Upon arrival, it is obvious that the driver is deceased. The 14-year-old is crying.

Nursing/Medical Two teenagers were riding a four-wheeled all-terrain vehicle. The driver was a 16-year-old female, who drove the four-wheeler into a tree. The passenger, a 14-year-old male, was thrown into a ditch. A BLS ambulance has just arrived at your facility with both patients without prior notification. Upon arrival, it is obvious that the 16-year-old is deceased. The 14-year-old is crying and is poorly strapped to a spine board.

Occupational Health/Industrial Two teenagers were riding a four-wheeled all-terrain vehicle. The driver was a 16-year-old female, who drove the four-wheeler into a tree. The driver was killed instantly. The passenger, a 14-year-old male, was thrown into a ditch. Your clinic is close to the collision, so you take a medical kit and go to the scene. Upon arrival, it is obvious that the 16-year-old is deceased. The 14-year-old is crying.

Military Two teenagers were riding a four-wheeled all-terrain vehicle on the military base. The driver was a 16-year-old female, who drove the four-wheeler into a tree. The driver was killed instantly. The passenger, a 14-year-old male, was thrown into a ditch. You are a medic on the military ambulance. Upon arrival, it is obvious that the driver is deceased. The 14-year-old is crying.

History

S—"My leg is killing me! Please help!"

A—no allergies

M—no medications

P—no significant past illnesses

L—last meal 2 hours ago

E—"I was on the back with my sister and we hit a tree. How is she doing? I want her here with me!"

Injuries

1. Open fracture of the right lower leg
2. Fracture of pelvis
3. Shock

Patient Instructions

You should be alert and complain of pain in the right lower leg. When your pelvis is examined, you should cry out loudly with pain.

Moulage Instructions

A full-face or half-face helmet should be in place in all settings. Open fracture is best done with commercial strap-on moulage, but it can be made with wax or plumber's putty and pieces of bone. Simulate diaphoresis.

Instructor Information

Scene size-up—scene safe, other patient deceased

Initial assessment

    General impression—potential for critical injuries

    LOC—alert

    Airway—open (helmet must be removed to evaluate)

    Breathing—rate and quality normal

    Ventilation instructions—may give oxygen

    Circulation

Pulses—present at the wrist, rate seems increased

Bleeding—slight bleeding from right lower leg

Skin color, condition, and temperature—warm and dry, color normal

Decision—rapid trauma survey due to mechanism

Rapid trauma survey

Head—no sign of trauma (was wearing helmet)

Neck—normal

Trachea—midline

Neck veins—flat

Chest

Looking—no DCAP-BTLS

Feeling—no TIC

Listening—breath sounds present and equal, normal heart sounds

Abdomen—slight tenderness of lower abdomen

Pelvis—unstable and tender

Extremities

Upper legs—normal

Scan of lower legs and arms—open fracture of right lower leg, arms normal

Exam of posterior—normal

Decision—load and go (unstable pelvis), two IV lines, splint leg

History (obtain from the patient)

Vital signs—BP 90/70, pulse 160, respiration 32, temperature normal

Ongoing exam

Subjective changes—abdominal pain is worse

Neurological

LOC—normal

Pupils—equal and reactive

Sensory—normal

Motor—normal

Airway—open

Breathing—normal rate and quality

Circulation

> **Blood pressure**—80/50

> **Pulses**—rate 175

> **Skin color, condition, and temperature**—pale, cool, clammy

Neck—nontender

> **Trachea**—midline

> **Neck veins**—flat

Chest—unchanged, heart sounds—normal

Abdomen—more tender in lower abdomen

Focused assessment of injuries

> **Leg**—splinted, still has good PMS, no bleeding now

> **Pelvis**—not rechecked

> **Abdomen**—still tender

Check interventions

> Is oxygen hooked up and turned on?

> Dressing blood-soaked?

> Are IVs running at correct rate to maintain BP of at least 90?

> Splint in good position?

Decision—continue present treatment

Secondary survey (should be done after transport)

> **History and vital signs**—BP 90/70, pulse 160, respiration 32

> **Neurological**

> > **LOC**—alert

> > **Pupils**—equal and reactive

> > **Sensory**—normal

> > **Motor**—normal

> **Head**—normal

> **Airway**—open

> **Breathing**—normal rate and quality

> **Neck**—nontender

> > **Trachea**—midline

Neck veins—flat

Circulation—BP and pulse as above; skin pale, cool, clammy

Chest—unchanged, heart sounds—normal

Abdomen—no change

Pelvis—do not examine again

Extremities

    Upper—normal, good PMS

    Lower—open fracture of right lower leg, distal pulses palpable, normal sensory, can wiggle toes, no bleeding if dressed

Decision—record and continue to monitor

SCENARIO 9

Setting

EMS/Prehospital The patient is a young male who was riding his horse when he was knocked from the horse by a low tree branch. He subsequently fell down a steep cliff. His riding companion called for help.

History

    S—"I hurt all over."

    A—allergic to penicillin

    M—insulin

    P—diabetes

    L—last meal was last night, approximately 18 hours ago

    E—"I was going home and my horse started galloping out of control; then I hit a branch that knocked me off, and I fell down the cliff."

Nursing/Medical The patient is a young male who was riding his horse when he was knocked from the horse by a low tree branch. He subsequently fell down a steep cliff. His riding companion called for help, and a nearby farmer put him in the back of his pickup truck and drove to your facility.

History

 S—"I hurt all over."

 A—allergic to penicillin

 M—insulin

 P—diabetes

 L—last meal was last night, approximately 18 hours ago

 E—"I was going home and my horse started galloping out of control; then I hit a branch that knocked me off, and I fell down the cliff."

Occupational Health/Industrial One of your truck drivers runs head-on into the brick company sign without slowing down. He tried to get away from the vehicle but collapsed after one step.

History

 S—"I hurt all over."

 A—allergic to penicillin

 M—insulin

 P—diabetes

 L—last meal was last night. Did not eat breakfast this morning.

 E—"I swerved to miss an animal and ran into a sign."

Military The patient is a teenage dependent of one of the officers on your base. He falls from a third-floor balcony onto concrete.

History

 S—"I hurt all over."

 A—allergic to penicillin

 M—insulin

 P—diabetes

 L—last meal was last night. Did not eat breakfast this morning.

 E—"I don't remember."

Injuries

1. Intra-abdominal bleeding
2. Fracture of left femur
3. Scalp laceration
4. Hypoglycemia (when asked, finger-stick glucose is 40)

Patient Instructions

Complain of pain when your abdomen is palpated or your left upper leg is examined.

Moulage Instructions

Use trousers with a large tear in left thigh area. The left thigh should have a large bruise, or write "fractured femur" on a piece of white tape with a felt-tip pen and apply it to the left thigh. Apply some fake blood to an area of the scalp (fake blood mixed with K-Y Jelly works well here—do not use this on light-colored hair, as it will stain the hair).

Instructor Information

Scene size-up—no danger, no other patients

Initial assessment

    General impression—potential for critical injuries

    LOC—alert but confused

    Airway—open

    Breathing—normal rate and quality

    Ventilation instructions—apply oxygen, assist if needed

    Circulation

        Pulses—present at neck and wrist, rate seems fast

        Bleeding—some bleeding from the scalp wound

        Skin color, condition, and temperature—normal

Decision—rapid trauma survey due to mechanism

Rapid trauma survey

    Head—bleeding from scalp laceration, otherwise normal

    Neck—no swelling or discoloration

        Trachea—midline

        Neck veins—flat

    Chest

        Looking—normal

        Feeling—no TIC

        Listening—breath sounds present and equal, heart sounds—normal

    Abdomen—diffusely tender to palpation

    Pelvis—stable and nontender

Extremities

    Upper legs—swelling, tenderness, and deformity of left upper leg

    Scan of lower legs and arms—normal

Exam of posterior—normal

Decision—load and go, two IV lines, traction splint left femur, blood glucose (40).

    Give IV glucose.

History (obtain from the patient)

Vital signs—BP 110/70, pulse 100, respiration 22, temperature normal

Neurological

    LOC—awake but confused

    Pupils—equal and reactive

    Sensory—normal

    Motor—normal

    GCS—(14) eyes (4), verbal (4), motor (6)

Ongoing exam

    Subjective changes—abdominal pain is worse

    Neurological

        LOC—alert and oriented if given glucose, decreased LOC if no glucose given

        Pupils—equal and reactive

        Sensory—unchanged

        Motor—unchanged

    Airway—open

    Breathing—normal rate and quality

    Circulation

        Blood pressure—60/40

        Pulses—rate 150

        Skin color, condition, and temperature—pale, cool, clammy

    Neck—nontender

        Trachea—midline

        Neck veins—flat

    Chest—normal, heart sounds—normal

Abdomen—distended and tender

Focused assessment of injuries

    Abdomen—worsening

    Scalp—no longer bleeding if dressed

    Left leg—unchanged

    Hypoglycemia—recheck glucose (136)

Check interventions

    Is oxygen hooked up and turned on?

    Blood glucose rechecked? (136)

    Are IVs running at correct rate to maintain systolic BP of 90–100?

    Dressing blood-soaked?

    Splint in good position?

    Cardiac monitor applied?

    Pulse oximeter applied? 98% saturation

    Decision—fluid bolus

Secondary survey (should be done after transport)

    History and vital signs—as above

    Neurological

        LOC—alert and oriented if given glucose, awake but confused if not

        Pupils—equal and reactive

        Sensory—normal

        Motor—normal

        GCS—(14) eyes (4), verbal (4), motor (6)

    Head—blood in hair from scalp laceration, no Battle's sign or raccoon eyes, face normal

    Airway—open

    Breathing—normal rate and depth

    Neck—nontender

        Trachea—midline

        Neck veins—flat

    Circulation—BP and pulse as above; skin warm and dry, but pale

    Chest—no change, heart sounds—normal

Abdomen—more tender

Pelvis—do not examine again

Extremities

    Upper—normal

    Lower—left leg should be splinted, good PMS

Decision—give IV glucose if not already done

SCENARIO 10

Setting

EMS/Prehospital A male motorcyclist loses control on a curve and collides with a guardrail. Police call for medical assistance when they determine the man is injured and unable to move.

History

    S—"I can't feel anything. I can't move."

    A—none

    M—none

    P—good health

    L—6 hours ago

    E—"I tried to lay the motorcycle down when I lost control, but the guardrail caught me."

Nursing/Medical A male motorcyclist loses control on a curve and collides with a guardrail. Police call for medical assistance when they determine the man is injured and unable to move; but EMS is significantly delayed, so they transport the patient in the back of a police van to the

hospital.

History

S—"I can't feel anything. I can't move."

A—none

M—none

P—good health

L—6 hours ago

E—"I tried to lay the motorcycle down when I lost control, but the guardrail caught me."

Occupational Health/Industrial A male crane operator slips and falls 30 feet/10 meters while climbing down the crane for lunch. A coworker witnesses the fall and notifies you.

History

S—"I can't feel anything. I can't move."

A—none

M—none

P—good health

L—6 hours ago

E—"I was climbing down the crane for lunch, like I do every day, but somehow I slipped."

Military A male recruit is repelling unsupervised from a platform when he loses his grip and falls 30 feet/10 meters. The drill sergeant finds the recruit and notifies you.

History

S—"I can't feel anything. I can't move."

A—none

M—none

P—good health

L—6 hours ago

E—"I was practicing climbing so I could pass the test."

Injuries

1. Fractured lower neck with spinal cord injury

2. Spinal shock

3. Fractured right tibia (open)

Patient Instructions

Complain of pain when your neck is examined. You can flex your arms at the elbows but have weak grip with your hands; otherwise, you are unable to move.

Moulage Instructions

The patient should wear a full-face motorcycle helmet. A partial-face helmet is an alternative. For OH/industrial and military settings, have the patient wear a hard hat or military helmet.

Instructor Information

Scene size-up—safe, no other patients

Initial assessment

    General impression—possible neck and spinal injury

    LOC—alert

    Airway—open

    Breathing—normal rate, shallow, diaphragmatic only

    Ventilation instructions—assist ventilation with oxygen

    Circulation

        Pulses—present at wrist, rapid (still has catecholamines present)

        Bleeding—none

        Skin color, condition, and temperature—normal color, sweaty, warm

Decision—rapid trauma survey due to mechanism and exam

Rapid trauma survey

    Head—face normal, helmet still in place

    Neck—tenderness at base of neck

        Trachea—midline

        Neck veins—flat

    Chest

        Looking—no movement of ribs with breathing, otherwise normal

        Feeling—no TIC, no sensation

        Listening—breath sounds present and equal, heart sounds—normal

    Abdomen—soft, no sensation

    Pelvis—stable

    Extremities

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Upper legs—normal

Scan of lower legs and arms—right tibia protruding, can flex arms, weak grips bilaterally, pulses present

Exam of posterior—normal

Decision—spinal injury, load and go

History (obtain from the patient)

Vital signs—BP 70/50, pulse 70, respiration 18, temperature normal

Ongoing exam

Subjective changes—patient still has no feeling from the neck down

Neurological

    LOC—normal

    Pupils—equal and reactive

    Sensory—unchanged

    Motor—unchanged

Airway—open

Breathing—unchanged

Circulation

    Blood pressure—80/60 if fluids given

    Pulses—rate 70

    Skin color, condition, and temperature—warm, dry, pink

Neck—unchanged

    Trachea—unchanged

    Neck veins—unchanged

Chest—unchanged, heart sounds—normal

Abdomen—unchanged

Focused assessment of injuries

    No change in neurological exam

Check interventions

    Is oxygen hooked up and turned on?

    Assisting respiration?

    Are IVs running at correct rate?

    Helmet left in place?

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Splint?

Secondary survey (should be done after transport)

    History and vital signs—after fluid challenge BP 80/60

    Neurological

        LOC—alert and oriented

        Pupils—equal and reactive

        Sensory—no sensation from the neck down

        Motor—can flex arms, weak grips bilaterally, no movement below the shoulders

    Head—face normal, helmet still in place

    Airway—open

    Breathing—rate 18, shallow

    Neck—still tender, some swelling

        Trachea—midline

        Neck veins—flat

    Circulation—BP and pulse as above, skin warm and dry

    Chest—unchanged, heart sounds—unchanged

    Abdomen—unchanged

    Pelvis—do not examine again

    Extremities

        Upper—unchanged   **Lower**—unchanged

SCENARIO 11

Setting

EMS/Prehospital The patient is a 50-year-old male semitruck driver who collided with a train at an uncontrolled crossing. He was ejected from the truck and is lying in the ditch.

Nursing/Medical The patient is a 50-year-old male semitruck driver who collided with a train at an uncontrolled crossing. He was ejected from the truck and transported by community first responders to your location.

Occupational Health/Industrial The patient is a 50-year-old male semitruck driver who collided with a train at an uncontrolled crossing just outside the gate to your plant. He was ejected from the truck and is lying in the ditch.

Military The patient is a 50-year-old male supply clerk who was driving a 6×6 truck and collided with a train at an uncontrolled crossing. He was ejected from the 6×6 and is lying in the ditch.

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History

Not available

Injuries

1. Fractured left femur (closed)

2. Fractured pelvis

3. Fractured ribs on left side with flail section

4. Shock

5. Closed head injury

Patient Instructions

Unconscious with no response to stimulus.

Moulage Instructions

Create bruising over ribs. Create bruising and swelling over femur. Simulate cyanosis and dia-phoresis.

Instructor Information

Scene size-up—the scene is safe in all settings. Mechanism depends on the setting chosen. No other patients.

Initial assessment

> **General impression**—potential for serious injuries
>
> **LOC**—curses and localizes to pain
>
> **Airway**—open
>
> **Breathing**—normal quality, increased rate
>
> **Ventilation instructions**—give supplemental oxygen
>
> **Circulation**
>
>> **Pulses**—present at the wrist, rapid
>>
>> **Bleeding**—no external bleeding
>>
>> **Skin color, condition, and temperature**—pale, clammy, cool

Decision—rapid trauma survey due to mechanism

Rapid trauma survey

> **Head**—no obvious injury

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Neck—normal, nontender

> **Trachea**—midline

> **Neck veins**—flat

Chest

> **Looking**—bruising over left chest

> **Feeling**—unstable section of anterior ribs on left side

> **Listening**—breath sounds present and equal, heart sounds—normal

Abdomen—normal

Pelvis—unstable

Extremities

> **Upper legs**—left leg swollen and bruised midfemur, right leg normal

> **Scan of lower legs and arms**—normal

Exam of posterior—normal

Decision—load and go (fractured pelvis), two IV lines, splint fractured femur

History—unable to obtain because of patient's level of consciousness

Vital signs—BP 80/60, pulse 140, respiration 24, temperature normal

GCS—(10) eyes—open to pain (2), verbal—curses to pain (3), motor—localizes to pain (5)

Ongoing exam

> **Neurological**

> > **LOC**—curses to pain

> > **Pupils**—equal and reactive

> > **Sensory**—localizes to pain

> > **Motor**—moves all extremities

> > **GCS**—unchanged

> **Airway**—open

> **Breathing**—normal

> **Circulation**

> > **Blood pressure**—if no IV fluids: BP 60/40; if IV fluids: BP 90/70

> > **Pulses**—rate if no IV fluids: 160; if IV fluids: 110

> > **Skin color, condition, and temperature**—pale, cool, clammy

> **Neck—**no change

Trachea—midline

Neck veins—flat

Chest—unchanged, heart sounds—normal

Abdomen—very tender

Focused assessment of injuries

Rib fractures—check flail and monitor heart

Fractured femur—traction splint

Fractured pelvis—stabilized on spine board

Shock—fluid boluses

Check interventions

Is oxygen hooked up and turned on?

Are IVs running at correct rate to maintain BP of 110–120 systolic?

Controlled flail segment?

Cardiac monitor applied? Sinus tachycardia

Pulse oximeter applied? 100% saturation

Secondary survey (should be done after transport)

History and vital signs—if given a bolus of IV fluids: BP 90/70, pulse 120, respiration 24

Neurological

LOC—curses to pain

Pupils—equal and reactive

Sensory—localizes to pain

Motor—moves all extremities

GCS—unchanged

Blood glucose—138

Head—normal, no fluid from ears or nose

Airway—open

Breathing—normal rate and quality

Neck—no tenderness or sign of trauma

Trachea—midline

Neck veins—flat

Circulation—no external bleeding; skin pale, cool, diaphoretic

Chest

    Looking—unchanged

    Feeling—anterior rib instability

    Listening—breath sounds still present and equal; heart sounds**—**normal

Abdomen—no change

Pelvis—do not examine again

Extremities

    Upper—normal

    Lower—unchanged from above, weak distal pulses

SCENARIO 12

Setting

EMS/Prehospital A young male at a building site was struck by a collapsing wall and debris. The man is under some rubble; however, you have full, easy access to him. Scene appears safe.

Nursing/Medical A young male at a building demolition site was struck by a collapsing wall and debris. His coworkers put him in the back of their pickup and brought him to your emergency department. The attending physician is with a cardiac arrest and cannot immediately assist you.

Occupational Health/Industrial A young male at a building demolition site was struck by a

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collapsing wall and debris. The man is under some rubble; however, you have full, easy access to him. Scene appears safe.

Military The patient is a young soldier who was on a "clearing mission" when a booby trap was tripped, causing a structural cave-in.

History

S—Pain in chest and right lower leg, "tingling all over," difficulty breathing, and ringing in his ears

A—no allergies

M—no medications

P—no significant past illnesses

L—last meal 3 hours ago

E—"All I saw was a something falling on me!"

Injuries

1. Open fracture of the right lower leg

2. Cervical-spine injury

3. Flail chest on the right side

4. Fracture of pelvis

5. Shock

Patient Instructions

You should be alert and complain of pain in the chest and right lower leg. You should describe "tingling all over," and complain of difficulty breathing, ringing in your ears, and difficulty hearing. When your pelvis is examined, you should cry out loudly with pain.

Moulage Instructions

Open fracture is best done with commercial strap-on moulage, but it can be made with wax or plumber's putty and pieces of bone (see makeup techniques in Chapter 9). The strap-on moulage is not as realistic, but it holds up much better during a long day of use. Flail chest is best made by applying a piece of white tape to the chest and, using a felt-tip pen, writing "flail chest" on it. Apply dirt around mouth, nose, and eyes.

Instructor Information

Scene size-up—no danger, mechanism of injury is as described, no other patients

Initial assessment

General impression—initially does not appear critically injured

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LOC—alert and responds appropriately

Airway—open and clear

Breathing—rate increased, quality labored

Ventilation instructions—should order 100% oxygen

Circulation

> **Pulses**—present and strong at the wrist, rate seems increased

> **Bleeding—**no external bleeding noted other than some blood on right lower leg (not actively bleeding)

> **Skin color, condition, and temperature**—warm and dry but slightly cyanotic

Decision—rapid trauma survey due to mechanism

Rapid trauma survey

> **Head—**minor bruising and small abrasions on face and neck

> **Neck**—no discoloration or swelling, tender to palpation

>> **Trachea**—midline

>> **Neck veins**—flat

> **Chest**

>> **Looking**—paradoxical motion of right chest

>> **Feeling**—instability and crepitation in right chest

>> **Listening**—breath sounds decreased on right, heart sounds**—**normal

>> **Percussion**—equal

> **Abdomen**—soft, slightly tender in lower quadrants

> **Pelvis**—unstable, painful to palpation

> **Extremities**

>> **Upper legs**—no apparent injury

>> **Scan of lower legs and arms**—open fracture of right lower leg, no active bleeding, normal PMS

> **Exam of posterior**—normal except that the neck is tender

> **Decision—**load and go due to flail chest and respiratory difficulty, notify medical direction, two IV lines, stabilize flail segment, 100% oxygen

> **History** (obtain from the patient)

> **Vital signs**—BP 120/90, pulse 110, respiration 30 and labored, temperature feels normal

Ongoing exam

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Subjective changes—patient feels better now

Neurological

    LOC—more alert after fluid bolus

    Pupils—equal and reactive

    GCS—(15) eyes (4), verbal (5), motor (6)

Airway—clear and open

Breathing—still painful with rate of 30/min but moving air better with stabilization of the flail

Circulation

    Blood pressure—90/50

    Pulses—rate 130

    Skin color, condition, and temperature—still pale, cool, diaphoretic

Neck—unchanged

    Trachea—still midline

    Neck veins—still flat

Chest—unchanged, heart sounds—normal

Abdomen—unchanged

Focused assessment of injuries

    Neck - stabilized?

    Flail chest - stabilized?

    Open fracture - dressed and splinted? No bleeding

    Shock - managed with cautious fluid resuscitation?

Check interventions

    Is oxygen hooked up and turned on?

    Is flail chest still stabilized?

    Are IVs running at a rate to maintain BP of 90–100 systolic?

    Is fracture well-splinted and wound dressed?

    Cardiac monitor applied?

    Pulse oximeter applied? 92% saturation

Secondary survey (should be done after transport)

    History and vital signs—unchanged from above

    Neurological

LOC—responds to verbal stimuli but now is pale and lethargic

Pupils—equal and reactive

Sensory—abnormal "tingling" sensation below the neck

Motor—normal

GCS—(14) eyes (4), verbal (4), motor (6)

Head—scalp normal, negative Battle's sign and raccoon eyes, no fluid from ears or nose, face stable

Airway—open and clear

Breathing—still labored, with rate of 30/min

Neck—tender to palpation

Trachea—midline

Neck veins—flat

Circulation—skin now pale, cool, diaphoretic; repeat BP is 80/50

Chest

Looking—flail should be stabilized

Feeling—no change

Listening—still has decreased breath sounds on right side, heart sounds—normal

Percussion—still equal

Abdomen—slight tenderness in lower quadrants, not distended

Pelvis—already examined; do not examine again

Extremities

Upper—minor scrapes and abrasions

Lower—should have splint and dressing on fracture of right lower leg, PMS is unchanged

Decision—check that the patient is getting 100% oxygen, give fluid bolus, check finger-stick glucose—120

SCENARIO 13

Setting

EMS/Prehospital A park employee was mowing grass on the side of a road when his tractor was struck on the left rear side by a truck traveling at high speed. The operator of the tractor was thrown from his tractor approximately 16 yards/18 meters.

Nursing/Medical A park employee was mowing grass on the side of a road when his tractor was struck on the left rear side by a truck traveling at high speed. The operator of the tractor was

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thrown from his tractor approximately 16 yards/18 meters. Local first responders brought him to your emergency department. Your attending physician is with a cardiac arrest and cannot immediately respond.

Occupational Health/Industrial A company grounds employee was mowing grass on the side of a road when his tractor was struck on the left rear side by a truck traveling at high speed. The operator of the tractor was thrown from his tractor approximately 16 yards/18 meters.

Military A PFC was mowing grass on the side of the protected area of the installation when his tractor was struck on the left rear side by a truck traveling at high speed. The operator of the tractor was thrown from his tractor approximately 16 yards/18 meters.

History

> S—"My chest and hips are killing me!"
>
> A—none
>
> M—"I take blood pressure pills and allergy pills" (for military scenario—no medications)
>
> P—high blood pressure (for military scenario—no significant past history)
>
> L—last meal 3 hours ago
>
> E—"I don't know where that truck came from that hit me!"

Injuries

1. Fracture of C-7, but the spinal cord has not been injured yet
2. Flail chest on the left
3. Ruptured spleen
4. Multiple fractures of the pelvis

Patient Instructions

You are awake and alert. Complain of pain in the left chest and hip. Do not complain of abdominal or neck pain. When the neck and abdomen are checked, complain of tenderness. When the pelvis is checked, complain of severe pain. Complain of difficulty breathing when your chest is examined.

Moulage Instructions

Write "flail chest" on a piece of white tape with a felt-tip pen. Apply it to the left side of the chest.

Instructor Information

Scene size-up—the scene is safe

Initial assessment

    General impression—potential for critical injuries

    LOC—alert and oriented

    Airway—open and clear

    Breathing—rapid, shallow, labored respiration

    Ventilation instructions—supplemental oxygen, assist ventilation as needed. Intubate if respiration worsens.

    Circulation

        Pulses—present at the wrist, rapid

        Bleeding—no external bleeding noted

        Skin color, condition, and temperature—cyanotic, pale, diaphoretic

Decision—rapid trauma survey based on mechanism and initial assessment

Rapid trauma survey

    Head—no injuries noted

    Neck—tender to palpation

        Trachea—midline

        Neck veins—flat

    Chest

        Looking—paradoxical movement on the left side

        Feeling—unstable segment on the left

        Listening—breath sounds decreased on the left, good heart sounds

        Percussion—equal bilaterally

    Abdomen—slightly tender to palpation

    Pelvis—unstable and tender

    Extremities

        Upper legs—no sign of injury

        Scan of lower legs and arms—no sign of injury

    Exam of posterior—no injury noted

    Decision—load and go, stabilize flail segment, two IV lines, monitor for shock

    History (obtain from the patient)

    Vital signs—BP 90/60, pulse 130, respiration 36, temperature normal

Ongoing exam

Subjective changes—patient complains of worsening abdominal pain and severe pain with breathing

Neurological

LOC—normal

Pupils—equal and reactive

Sensory—normal

Motor—normal

Airway—open

Breathing—painful but adequate

Circulation

Blood pressure—90/60

Pulses—rate 130

Skin color, condition, and temperature—pale, cool, clammy

Neck—swelling and painful (do not palpate anymore)

Trachea—midline

Neck veins—flat

Chest—unchanged, heart sounds—normal

Abdomen—more distended and tender

Focused assessment of injuries

Neck—swollen and tender but no paralysis or weakness

Flail segment—stabilized, patient splinting on left but no hemothorax

Abdomen—becoming more tender and distended

Check interventions

Is oxygen hooked up and turned on?

Assisted ventilation as needed?

Are IVs running at rate to maintain BP of 90–100?

Flail segment well-stabilized?

Cardiac monitor applied?

Pulse oximeter applied? 92% saturation

Secondary survey (should be done after transport)

History and vital signs—after fluid bolus: BP 100/60, pulse 120, respiration 30 and less painful if flail segment stabilized

Neurological

> **LOC**—alert

> **Pupils**—equal and reactive

> **Sensory**—normal

> **Motor**—normal

Head—scalp normal, no drainage from ears or nose, negative Battle's sign and raccoon eyes, face stable

Airway—open

Breathing—rate and quality improved if flail has been stabilized

Neck—some swelling now, more tender

> **Trachea**—midline

> **Neck veins**—flat

Circulation

> BP as above

> Pulse as above

> **Skin color, condition, and temperature**—pale, cool, clammy

Chest

> **Looking**—should have flail segment stabilized

> **Feeling**—should not palpate again

> **Listening**—decreased breath sounds on left, heart sounds unchanged

> **Percussion**—still equal

Abdomen—distended and painful now

Pelvis—should not be examined again

Extremities

> **Upper**—no DCAP-BTLS, good PMS

> **Lower**—no DCAP-BTLS, good PMS

Decision—continue present therapy, monitor for need to intubate

[INSERT ITLS SCENARIO GRADE SHEET HERE]

[Separate Document]

ITLS SCENARIO GRADE SHEET

Student Name:		Date:	Scenario #:	[ ] Basic [ ] Advanced	[ ] Practice [ ] Test [ ] RT
Time Started:	Time Primary completed:		Time Transported:		Time Secondary completed :

ACTION	✓	COMMENTS
PATIENT ASSESSMENT — PRIMARY SURVEY		
Scene Size-up Standard Precautions		
Scene Hazards		
Number of Patients		
Need for More Help or Equipment		
Mechanism of Injury		
General Impression Age, Sex, Weight		
General Appearance		
Body Position		
Position in Environment		
Patient Activity		
Obvious Severe Injury or Major Bleeding		
LOC AVPU		
Airway Snoring, Gurgling, Stridor, Silence		
Breathing Present? Rate, Depth, Effort		
Radial/Carotid Pulses Present? Rate, Rhythm, Quality		
Skin Color, Temp, Moisture, Capillary Refill		
Uncontrollable External Hemorrhage?		
Head and Neck Major facial injuries		
Bruising, swelling, penetrations		
Subcutaneous emphysema?		
Neck vein distention?		
Tracheal deviation?		
Chest Look: Asymmetry, Contusion, Penetrations, Paradoxical Motion, Chest Rise		
Feel: Tenderness, Instability, Crepitation		
Breath Sounds Present? Equal?		
If decreased breath sounds, percussion		
Heart Tones		
Abdomen Look: bruising, penetration/evisceration		
Gently palpate: tenderness, rigidity, distention		
Pelvis Deformity, penetrating wounds, TIC		
Lower Extremities Upper: swelling, deformity, TIC		
Lower: scan wounds, swelling, deformity		
Motor, sensory before transfer to backboard		
Upper Extremities Scan wounds, swelling, deformity		
Motor, sensory before transfer to backboard		
Posterior Penetrations, deformity, edema		
IF CRITICAL, TRANSFER TO AMBULANCE		

ACTION	✓	COMMENTS
Baseline Vital Signs HR, RR, BP		
History SAMPLE		
IF ALTERED MENTAL STATUS Pupils Size? Reactive? Equal?		
Glasgow coma scale		
Orientation, emotional state		
Signs of cerebral herniation		
Medical identification devices		
Blood glucose		
Critical transport decision		

ACTION	✓	COMMENTS
ONGOING ASSESSMENT		
Subjective Ask patient if changes in how feels		
Reassess mental status LOC, pupils		
If altered mental status Recheck GCS		
Reassess airway		
Reassess breathing and circulation Recheck vital signs		
Skin color, condition, temperature		
Check for neck vein distention		
Check for tracheal deviation		
Recheck chest		
Breath sounds Quality? Equal?		
Reassess heart sounds		
Reassess abdomen — if possible injury Development of tenderness, distention, rigidity		
Check all identified injuries For example: Lacerations for bleeding PMS distal to injuries on extremities Flail segments Pneumothorax Open chest wounds		
Check all interventions For example: ET tube for patency and position Oxygen for flow rate IVs for patency and fluid rate Seals on sucking chest wounds Patency of decompression needle Splints and dressings Impaled objects for stabilization If pregnant, body position Cardiac monitor, SpO_2, $EtCO_2$		

GRADE KEY: [✓] **Completed, skill performed in sequence**
[D] **Delayed, performed out of sequence**
[X] **Skill not performed, too late or incorrectly**   **June 2011**

ACTION	✔	COMMENTS
PATIENT ASSESSMENT — SECONDARY SURVEY		
Repeat Initial Assessment		
Repeat Vital Signs		
Consider Cardiac monitor, SpO$_2$, EtCO$_2$		
LOC AVPU		
If conscious, orientation and emotional state		
If altered mental status, GCS		
If altered mental status, blood glucose		
If altered mental status, SpO$_2$		
If altered mental status, consider naloxone		
Pupils Size, equality, response to light		
Motor Move fingers and toes?		
Sensation Feel fingers and toes?		
If unconscious, respond to pinch?		
Head DCAP-BTLS		
Raccoon eyes		
Battle's sign		
Drainage from ears or nose		
Mouth		
Reassess airway		
Neck DCAP-BTLS		
Neck vein distention?		
Tracheal deviation?		
Chest DCAP-BTLS, paradoxical movement		
Instability and crepitation		
Breath sounds Present? Equal? Quality?		
If decreased breath sounds, percussion		
Heart sounds		
Recheck wound seals, injuries		
Abdomen Signs of blunt or penetrating trauma		
Palpate all quadrants for tenderness, rigidity		
Pelvis and Extremities DCAP-BTLS		
PMS distal to injuries on extremities		
IF CRITICAL, TRANSPORT IMMEDIATELY		

CRITICAL ACTIONS

	Completes scene size-up and uses universal precautions
	Performs initial assessment and interacts with patient
	Performs organized rapid trauma survey or focused exam
	Ensures spinal motion restriction
	Ensures appropriate oxygenation and ventilation
	Recognizes and treats all life-threatening injuries
	Uses appropriate equipment and techniques
	Recognizes critical trauma, time, and transport priorities
	Performs Secondary Survey (when time permits)

IMPORTANT ACTIONS

	Performs Ongoing Exam (when time permits)
	Utilizes time efficiently
	If critical, notifies medical direction early
	Gives appropriate report to medical direction
	Demonstrates acceptable skill techniques
	Displays leadership and teamwork

ADDITIONAL ACTIONS

	Finish bandaging and splinting after Secondary Survey (when time permits)
	Vital signs every 5 minutes for critical patents, every 15 minutes for stable
	Repeats Ongoing Exam each time patient moved or intervention performed
	Repeats Ongoing Exam if patient condition worsens
	Appropriately interacts with patient, family, and bystanders

GRADE KEY: [✔] **Completed, skill performed in sequence**
[D] **Delayed, performed out of sequence**
[X] **Skill not performed, too late or incorrectly**

June 2011

OVERALL GRADE

[ ] Excellent   [ ] Good   [ ] Adequate   [ ] Inadequate

Comments:

Lead Instructor Name (print):   Signature:

Instructor Name (print):   Signature:

Instructor Name (print):   Signature:

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Instructor Training Course

The instructor course must be taught by affiliate faculty. This is generally a 1-day course and may be taught the day before a scheduled provider course so that the instructor candidates can teach in the course and be monitored at that time. Chapters may set policy regarding the timeframe in which an instructor candidate must complete the instructor course and be monitored teaching a provider course. In most cases, instructor candidates have one year to complete the process.

Slides are available from the ITLS chapter office for this course.

MANDATORY TOPICS FOR AN ITLS INSTRUCTOR COURSE

Introduction

Structure of ITLS program internationally and within the chapter

Chapter policy and procedures

Effective Teaching Techniques

How to teach

The bad lecture

The good lecture

Faculty Meetings

Precourse

Before skill stations

Before patient assessment teaching and testing

Postcourse

Moulage Techniques

Patient Assessment Stations

Instructor objectives

Setup

Techniques and troubleshooting

Grading criteria and grading sheets

Students must teach the skill stations

Mini-Lectures

Summary

The instructor candidates should receive continuing education credit for the number of hours of the course. Instructor candidates who attend a 1-day instructor course will be monitored at future provider courses. If the instructor candidates attend an instructor course in conjunction with a provider course (3-day instructor course), they will be monitored during that course and may re-

ceive certification at that time depending upon their performance in the course

SAMPLE AGENDA FOR ONE-DAY INSTRUCTOR COURSE

Registration   30 min

Introduction to ITLS   30 min

   A. Structure of the ITLS program internationally

   B. Structure of the local ITLS chapter

   C. Chapter policies and procedures

   D. Obtaining authorization for a course

   E. Administrative guidelines

      1. Books

      2. Slides

      3. Use of the ITLS course management system (CMS)

      4. Course fees

      5. Postcourse paperwork

ITLS format   30 min

   A. Faculty meetings

      1. Precourse

      2. Before skill stations

3. Before patient assessment scenario teaching and testing

4. Postcourse

B. Lectures

C. Skill stations

D. Patient assessment scenario teaching and testing

Effective Teaching Techniques   30 min

A. How to teach

B. The bad lecture

C. The good lecture

Break   15 min

Mini-lectures with review and feedback   90 min

Lunch   60 min

Moulage techniques   60 min

Skill stations   180 min (including 15-min break)

A. Objectives

B. Setting up

C. Techniques and troubleshooting

D. Grading criteria and grading sheets

E. Students demonstrate teaching of skill stations

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Wrap-up	15 min
Faculty meeting	30 min

INSTRUCTOR CANDIDATE MONITORING

After completing the ITLS instructor course, the instructor candidate should be paired with an experienced instructor during skill station teaching and patient assessment scenario teaching and testing. The chapter affiliate faculty member monitoring the course must have a list of the instructor candidates and observe them periodically during the course. At the conclusion of the postcourse faculty meeting, the chapter affiliate faculty member should meet separately with the instructors who were assigned instructor candidates to determine whether the candidates should be certified or should be required to gain more experience. Feedback should be provided to the instructor candidates.

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The Provider Course

SCENE SIZE-UP

STUDENT MANUAL – CHAPTER 1

ITLS instructors are responsible for knowing all the ITLS material in order to present their assigned topic in a simple and easy-to-understand manner that ties in with the other parts of the ITLS method. The lectures are designed to present both basic and advanced information geared to the prehospital care of the trauma patient. Please keep this in mind as you give your lecture, and refrain from adding unnecessary advanced material more applicable to the hospital environment. This may be modified if you are teaching hospital personnel. Feel free to add material that is practical and pertinent, but remember to keep the lecture within the time allotted. The students should have read and studied the chapters. When you lecture you should present, reinforce, and explain only the key concepts. ITLS slides are not divided for advanced and basic courses.. If you are teaching EMT-Bs or first responders, please explain that they are not responsible for the advanced procedures mentioned on the slides; however, the inclusion of these procedures allows the students to be familiar with situations in which calling for an advanced unit, if available, would be beneficial.

Chapter Objectives

Upon completion of this lecture, the student should be able to:

1. Discuss the steps of the scene size-up.

2. List the two basic mechanisms of motion injury.

3. Identify the three collisions associated with a motor-vehicle crash (MVC), and relate potential patient injuries to deformity of the vehicle, interior structures, and body structures.

4. Name the five common forms of MVCs.

5. Describe potential injuries associated with proper and improper use of seat restraints, headrests, and air bags in a head-on collision.

6. Describe potential injuries from rear-end collisions.

7. Describe the three assessment criteria for falls, and relate them to anticipated injuries.

8. Identify the two most common forms of penetration injuries, and discuss associated mechanisms and extent of injury.

9. Relate five injury mechanisms involved in blast injuries and how they relate to scene size-up and patient assessment.

Key Lecture Points

1. Explain the relationship of time to patient survival and how this affects our actions at the scene.

2. Explain the steps of the scene size-up and the importance of each step.

3. Explain the importance of being aware of mechanisms of injury.

4. Briefly review the concept of transfer of energy.

5. Stress the concept of the "three collisions."

6. Briefly review the highlights of specific situations.

a. Large vehicle accidents

    1.   Frontal deceleration—effect on driver and passengers

    2.   Lateral impact

    3.   Rear impact

    4.   Rollover

    5.   Effect of restraints—lap belts, cross-chest lap belts, and air bags

    6.   Tractor accidents

b. Small vehicle accidents

    1.   Motorcycles

    2.   All-terrain vehicles

    3.   Personal watercraft

    4.   Snowmobiles

c. Pedestrian injuries

d. Falls

e. Penetrating injuries

    1.   Knives

    2.   Gunshot wounds

f. Blast scenes and injuries

TRAUMA ASSESSMENT AND MANAGEMENT

STUDENT MANUAL – CHAPTER 2

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Note: Chapter 21 is not core lecture material for the basic ITLS course. Prior to giving the Assessment and Initial Management, the faculty should review Chapter 21 (see Table 21-1).

Chapter Objectives

Upon completion of this lecture, the student should be able to:

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1. Outline the steps in the ITLS trauma assessment and management.

2. Describe the ITLS Primary Survey.

3. Explain the initial assessment and how it relates to the rapid trauma survey and the focused exam.

4. Describe when the initial assessment can be interrupted.

5. Describe when critical interventions should be made and where to make them.

6. Identify which patients have critical conditions and how they should be managed.

7. Describe the ITLS Ongoing Exam.

8. Describe the ITLS Secondary Survey.

Key Lecture Points

1. The concept of simultaneous assessment (team leader) and delegated intervention (team members) in life-threatening emergencies needs to be stressed (the "Fix It" process).

2. Note serious external hemorrhage should be recognized in the general impression (C-A-B-C).

3. Point out that the initial assessment is interrupted only for airway obstruction, if the scene becomes too dangerous, or if there is the need to perform CPR.

4. The step-by-step assessment scheme must be taught.

5. Emphasize the need to get the critically injured patient out of the field and to an appropriate hospital as quickly as possible. Emphasize 5-minute or less scene time.

6. Discuss and stress that the Ongoing Exam comes after the Primary Survey and before the

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Secondary Survey.

7. Stress that the Ongoing Exam should be repeated any time the patient's condition worsens.

AIRWAY MANAGEMENT

STUDENT MANUAL – CHAPTER 4

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Chapter Objectives

Upon completion of this lecture, the student should be able to:

1. Describe the anatomy and physiology of the respiratory system.

2. Explain the importance of observation as it relates to airway control.

3. Describe methods to deliver supplemental oxygen to the trauma patient.

4. Briefly describe the indications, contraindications, advantages, and disadvantages of the following airway adjuncts:

   a. Nasopharyngeal airways

   b. Oropharyngeal airways

   c. Bag-masks

   d. Flow-restricted oxygen-powered ventilation devices

   e. Blind insertion airway devices

   f. Endotracheal intubation

5. Describe the predictors of difficult mask ventilation and endotracheal intubation.

6. Describe the Sellick maneuver.

7. Describe the essential components of an airway kit.

Key Lecture Points

1. Review anatomy.

2. The differences in airway management of the trauma patient as opposed to the medical patient need to be clearly emphasized. Particular emphasis needs to be placed on stabilizing the cervical spine and maintaining stability of the cervical spine during airway maneuvers.

3. Stress that any movement, especially hyperextension of the cervical spine during airway maneuvers, may do great damage.

4. Continuous monitoring of the airway to be sure it remains patent. Stress the point that suction must be immediately available.

5. High-flow oxygen (as close to 100 percent as possible) must be provided to trauma patients. Discuss oxygen settings.

6. Remind students that the oropharyngeal airway is for use only in the unconscious patient with no gag reflex and that type of patient should be considered for an endotracheal tube (ETT).

7. Review airway management in the conscious versus unconscious patient.

8. Stress that EMTs tend to inadvertently hyperventilate patients. The starting ventilatory rate should be about 8 breaths per minute. Use of pulse oximetry is recommended.

9. Discuss capnography as the standard for confirming and monitoring the ETT position. Mention external larynx manipulation (ELM) as a means of visualizing the vocal cords

10. Discuss the "BOOTS" mnemonic as a predictor of the patient who will be difficult to ventilate with a bag-valve mask.

10. Review management of the prone patient and the patient with profuse upper airway bleeding

THORACIC TRAUMA

STUDENT MANUAL – CHAPTER 6

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signed topic in a simple and easy-to-understand manner that ties in with the other parts of the

ITLS method. The lectures are designed to present both basic and advanced information geared

to the prehospital care of the trauma patient. Please keep this in mind as you give your lecture,

and refrain from adding unnecessary advanced material more applicable to the hospital environ-

ment. This may be modified if you are teaching hospital EMS personnel. Feel free to add materi-

al that is practical and pertinent, but remember to keep the lecture within the time allotted. The

students should have read and studied the chapters. When you lecture you should present, rein-

force, and explain only the key concepts. ITLS slides are not divided between advanced and

basic courses.. If you are teaching EMT-Bs or first responders, please explain that they are not

responsible for the advanced procedures mentioned on the slides; however, the inclusion of these

procedures allows the students to be familiar with situations in which calling for an advanced

unit, if available, would be beneficial.

Chapter Objectives

Upon completion of this lecture, the student should be able to:

Identify the major symptoms of thoracic trauma.

2. Describe the signs of thoracic trauma.

3. State the immediate life-threatening thoracic injuries.

4. Explain the pathophysiology and management of an open pneumothorax.

5. Describe the clinical signs of a tension pneumothorax in conjunction with appropriate man-

agement.

6. List three indications to perform emergency chest decompression.

7. Explain the hypovolemic and respiratory compromise pathophysiology and management in massive hemothorax.

8. Define flail chest in relation to associated physical findings and management.

9. Identify the triad of physical findings in the diagnosis of cardiac tamponade.

10. Explain the cardiac involvement and management associated with blunt injury to the chest.

Key Lecture Points

1. Briefly review the anatomy of the chest, particularly the great vessels.

2. Emphasize load-and-go conditions and discuss why these conditions are so critical:

   a. Massive hemothorax with shock. Explain that when massive hemothorax has occurred, as evidenced by dullness to percussion and diminished breath sounds in the base of the affected lung, massive hemorrhage has occurred into the chest with major blood vessel disruption and massive blood loss. If these patients are not rapidly taken to surgery, they usually die.

   b. Tension pneumothorax. Explain how the increased pressure in the chest reduces blood return to the heart, causing reduction in cardiac output, and thus producing shock. Stress the signs and symptoms of the tension pneumothorax (review the Primary Survey) and how critical it is not to leave out steps in the Primary Survey, which would prevent the identification of this problem.

    c. Penetrating chest trauma with shock. Explain that the penetrating chest injury with result-ing evidence of shock is a load-and-go situation because of the many serious and poten-tially lethal conditions that may result.

3. Discuss the mechanics of airflow during inspiration and expiration. Discuss how the presence of an open wound into the pleural space decreases air movement through the tracheobron-chial tree.

4. Discuss the pathophysiology of the flail chest and the management of this problem: assisted ventilation and prevention of movement of the flail segment if it is decreasing air movement through the tracheobronchial tree. Initially stabilize with manual pressure and then stabilize with bulky dressings taped to the chest wall when the patient is placed on a backboard. Point out that intubation (patient usually has a gag reflex) and positive pressure ventilation (CPAP, if available) are the most effective methods to stabilize the flail and oxygenate the patient.

5. A review of the mechanism of injury in chest trauma is appropriate. Stress the importance of anticipating serious chest trauma or the potential for life-threatening injury even before dete-rioration has occurred. This is particularly important in those patients with evidence of major chest trauma.

SHOCK EVALUATION AND MANAGEMENT

STUDENT MANUAL – CHAPTER 8

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to the prehospital care of the trauma patient. Please keep this in mind as you give your lecture, and refrain from adding unnecessary advanced material more applicable to the hospital environment. This may be modified if you are teaching hospital EMS personnel. Feel free to add material that is practical and pertinent, but remember to keep the lecture within the time allotted. The students should have already read and studied the chapters. When you lecture you should present, reinforce, and explain only the key concepts. ITLS slides are not divided between advanced and basic courses. If you are teaching EMT-Bs or first responders, please explain that they are not responsible for the advanced procedures mentioned on the slides; however, the inclusion of these procedures allows the students to be familiar with situations in which calling for an advanced unit, if available, would be beneficial.

Chapter Objectives

Upon completion of this lecture, the student should be able to:

1. List the four components of the vascular system necessary for normal tissue perfusion.

2. Describe symptoms and signs of shock in the order that they develop, from the very least to the very worst.

3. Describe the three common clinical shock syndromes.

4. Explain the pathophysiology of hemorrhagic shock, and compare it to the pathophysiology of mechanical and neurogenic shock.

5. Describe the management of the following:

    a. Hemorrhage that can be controlled

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b.   Hemorrhage that cannot be controlled

c.   Nonhemorrhagic shock syndromes

6. Discuss the use of hemostatic agents for uncontrolled extremity hemorrhage.

7. Discuss the current indications for the use of IV fluids in the treatment of hemorrhagic shock.

Key Lecture Points

1. Discuss the modern concept of "shock": threat to normal cell function caused by diminished tissue perfusion and/or hypoxia.

2. Discuss the pathophysiology of hemorrhagic shock, including the classic signs and symptoms and their causes.

3. Discuss the three shock syndromes:

a.   Low volume (absolute hypovolemia)

b.   High space (relative hypovolemia)

c.   Mechanical (cardiogenic or obstructive)

4. Discuss the management of shock:

a.   Posttraumatic hemorrhage

1.   Exsanguinating external hemorrhage that can be controlled

2.   Exsanguinating external hemorrhage that cannot be controlled

3.   Exsanguinating internal hemorrhage

b.   Nonhemorrhagic shock

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1. Mechanical shock

2. High-space shock

5. Discuss the use of capnography to monitor shock.

6. Discuss the use of tourniquets and hemostatic agents in the situation of exsanguinating hemorrhage.

7. Stress that shock is, in general, recognized too late and treated insufficiently. Point out that delaying transport of a patient in shock is a critical mistake.

HEAD TRAUMA

STUDENT MANUAL – CHAPTER 10

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procedures allows the students to be familiar with situations in which calling for an advanced unit, if available, would be beneficial.

Chapter Objectives

Upon completion of this lecture, the student should be able to:

1. Describe the anatomy of the head and brain.

2. Describe the pathophysiology of traumatic brain injury.

3. Explain the difference between primary and secondary brain injury.

4. Describe the mechanisms for the development of secondary brain injury.

5. Describe the assessment of the patient with a head injury.

6. Describe the prehospital management of the patient with a head injury.

7. Recognize and describe the management of the cerebral herniation syndrome.

8. Identify potential problems in the management of the patient with a head injury.

Key Lecture Points

1. Cover the anatomy.

2. Cover the physiology of the brain, and explain why hyperventilation is no longer recommended except in cases of herniation syndrome.

3. Emphasize the control of the airway in the patient with an altered level of consciousness. Stress that suction must be available at all times.

4. Stress that a patient with a serious head injury (Glasgow coma score of 8 or less) will not tolerate hypoxia or hypotension. In this situation maintain the blood pressure between 110 and 120 mm Hg systolic.

5. Mention that prehospital providers tend to inadvertently hyperventilate head-injured patients. Stress that, if possible, capnography should be used to prevent inadvertent hyperventilation.

6. Mention the aspects of the Glasgow coma score and that each part should be recorded, not just the total score. This score should always be recorded if there is altered mental status.

7. Stress indications for hyperventilation.

SPINAL TRAUMA

STUDENT MANUAL – CHAPTER 11

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procedures allows the students to be familiar with situations in which calling for an advanced unit, if available, would be beneficial.

Chapter Objectives

Upon completion of this lecture, the student should be able to:

Explain the normal anatomy and physiology of the spinal column and spinal cord.

2. Define spinal motion restriction (SMR) and explain why this term is more accurate than "spinal immobilization".

3. Describe mechanisms of injury where SMR may be beneficial.

4. Describe one mechanism of injury where SMR can cause a significant decrease in survival.

5. Explain the difference between Emergency Rescue and Rapid Extrication techniques, and give examples of when each would be appropriate.

6. Describe history and assessment criteria that identify patients who do not need SMR.

7. Give examples of special situations for which SMR techniques may need to be altered.

8. Using the clinical evaluation, differentiate neurogenic shock from hemorrhagic shock.

Key Lecture Points

1. Cover the anatomy of the spine briefly.

2. Reinforce that any trauma patient who has an altered level of consciousness must be presumed to have a cervical-spine injury until proven otherwise. Appropriate precautions must

be taken.

3. Stress that not only must the cervical spine be protected but also the entire spine, including the lumbar and dorsal spine.

4. Briefly discuss the signs, symptoms, and treatment of neurogenic shock.

5. Stress documentation of the brief neurological exam (movement and sensation of hands and feet) before and after extrication or movement of the patient with a suspected spinal injury.

6. Stress that full SMR includes cervical collar, head immobilizer, and appropriate strapping applied to the patient on a long spine board.

7. Stress that cervical collars alone offer little to no protection of the cervical spine. ITLS teaches that SMR is manually maintained by a team member until the patient is secured to the long spine board.

8. Emphasize that SMR on a long spine board MANDATES airway protection by the rescuer due to the patient's being prevented from protecting himself or herself.

9. Discuss the indications for rapid extrication (without using short boards or KED-type devices). Primary Survey of the patient identifies a condition that requires immediate intervention that cannot be done in the entrapped area, such as

   a. Airway obstruction that cannot be relieved by jaw thrust or finger sweep

   b. Cardiac or respiratory arrest

   c. Chest or airway injuries requiring ventilation or assisted ventilation

   d. Deep shock or bleeding that cannot be controlled

10. Note that there are other situations that are so desperate that you may not have time to use any technique and emergency rescue is warranted to pull the patient to safety. The need for emergency rescue is identified during the scene survey with circumstances that may immediately endanger the patient and the rescuers, such as

   a. Fire or immediate danger of fire

   b. Danger of explosion

   c. Rapidly rising water

   d. Structure in danger of collapse

   e. Continuing toxic exposure

11. Mention that short backboard–type SMR devices may be difficult to apply and ineffective with pregnant and very obese patients.

12. Briefly clarify management of unusual circumstances, such as

   a. Closed space rescue

   b. Water rescue

   c. Prone and standing patients

   d. Pediatrics

   e. Geriatrics

   f. Helmet removal (stress that studies have found that rescue scissors will not efficiently remove face masks)

   g. Obese patients

h. Neck or face wounds

ABDOMINAL TRAUMA

STUDENT MANUAL – CHAPTER 13

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Chapter Objectives

Upon completion of this lecture, the student should be able to:

1. Identify the basic anatomy of the abdomen, and explain how abdominal and chest injuries

may be related.

2. Differentiate between blunt and penetrating injuries, and identify complications associated with each.

3. Describe the treatment required for the patient with protruding viscera.

4. Relate how injuries apparent on the exterior of the abdomen can damage underlying structures.

5. Describe possible intra-abdominal injuries based on findings of history, physical examination, and mechanism of injury.

6. List the advanced life support interventions for patients with abdominal injuries.

Key Lecture Points

1. Cover the anatomy of the abdomen.

2. Stress the importance of the abdomen with regard to morbidity and mortality associated with major trauma.

3. Mention that a distended abdomen is a very late sign of hemorrhage within the abdomen.

4. Mention that abdominal trauma with shock is a grim finding and must be rapidly managed.

5. Discuss pelvic fractures and their potential for massive bleeding.

EXTREMITY TRAUMA

STUDENT MANUAL – CHAPTER 14

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Chapter Objectives

Upon completion of this lecture, the student should be able to:

1. Prioritize extremity trauma in the assessment and management of life-threatening injuries.

2. Discuss the major complications and treatment of the following extremity injuries:

   a. Fractures

b. Dislocations

c. Open wounds

d. Amputations

e. Neurovascular injuries

f. Sprains and strains

g. Impaled objects

h. Crush injuries

3. Discuss the pathophysiology of compartment syndrome and which extremity injuries are most likely to develop this complication.

4. Describe the potential amount of blood loss from pelvic and femur fractures.

5. Discuss major mechanisms of injury, associated injuries, potential complications, and management of injuries of the following:

a. Pelvis

b. Femur

c. Hip

d. Knee

e. Tibia and fibula (including ankle)

f. Clavicle and shoulder

g. Elbow

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h. Forearm and wrist

i. Hand or foot

Key Lecture Points

1. Stress that during the ITLS Primary Survey the extremities MUST be examined for exsan-
    guinating blood loss.

2. The treatment of extremity trauma should be de-emphasized in the patient with a load-and-go
    condition. In this scenario, traction splints should not be applied on scene; rather, a long
    spine board should be employed initially. Other splints can be applied during transport if
    there is time.

3. Estimated blood loss in major extremity fractures should be covered.

4. The splints available for various purposes should be mentioned.

5. Stress that the rescuer must note neurovascular status of the extremities before and after
    splinting procedures.

6. Mention that when there is bleeding that cannot be controlled by pressure, use of a tourniquet
    and/or hemostatic agents is warranted.

BURNS

STUDENT MANUAL – CHAPTER 16

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Chapter Objectives

Upon completion of this lecture, the student should be able to:

1. Identify the basic anatomy of the skin, including

    a. Epidermal and dermal layers

    b. Structures found within the skin

2. List the basic functions of the skin.

3. Describe types of burns as a function of burn depth.

4. Estimate depth of burn based on skin appearance.

5. Estimate extent of burns using the rule of nines.

6. Identify complications and describe the management of

    a. Thermal burns

    b. Chemical burns

    c. Electrical burns

7. List situations and physical signs that

    a. Indicate inhalation injury

    b. Suggest carbon monoxide poisoning

8. Discuss how carbon monoxide causes hypoxia.

9. Describe the treatment of carbon monoxide poisoning.

10. Identify which patients may require transport to a burn center.

Key Lecture Points

1. Review the types and classifications of burns.

2. Discuss the management of different types of burns. Note should be made that while the burns should be cooled briefly to control ongoing heat injury, burns should not be subjected to prolonged cold exposure due to the risk of hypothermia. Mention application of antimicrobial sheets for prolonged transports.

3. Discuss the complications of major burns, such as airway compromise and later fluid loss.

4. Discuss the need to consider the mechanism of injury, especially with regard to the potential for carbon monoxide or other toxic gas inhalation. A note should be made as to whether this

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injury occurred in an enclosed space.

5. Stress the need for maintaining body temperature.

6. Discuss the treatment of carbon monoxide poisoning. Unless otherwise indicated, 100% oxygen should be used in the major burn patient until he can be further evaluated.

7. Discuss the findings that suggest inhalation injury, and stress that the rescuer must always be alert to this injury.

8. Stress that the rescuer should record the time that the burn occurred.

9. Review chemical burns and how their treatment differs from that of thermal burns.

10. Review electrical burns and lightning burns, and discuss their treatment.

11. Stress the danger of becoming a victim when dealing with electrical burns.

12. Mention that the rescuers should be alert to the signs of child abuse when dealing with burned children.

TRAUMA IN CHILDREN

STUDENT MANUAL – CHAPTER 17

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Chapter Objectives

Upon completion of this lecture, the student should be able to:

1.   Describe effective techniques for gaining the confidence of children and their parents.

2.   Predict pediatric injuries based on common mechanisms of injury.

3.   Describe the ITLS Primary and Secondary Surveys in the pediatric patient.

4.   Demonstrate understanding of the need for immediate transport in potentially life-
        threatening circumstances, regardless of the availability of immediate parental consent.

5.   Differentiate the equipment needs of pediatric patients from those of adults.

6.   Describe the various ways to perform spinal motion restriction (SMR) on a child and how
        this differs for an adult.

7.   Discuss the need for involvement of EMS personnel in prevention programs for parents
        and children.

Key Lecture Points

1. Discuss the differences and similarities between the adult and pediatric patient with regard to trauma management.

2. Cover the various baseline vital signs expected for the different age groups.

3. Note that the ITLS Primary Survey sequence is the same for pediatric as for adult patients.

4. Note that children will appear to be stable with fewer warning signs of deterioration, which can be followed by sudden disastrous decompensation.

5. Mention that gastric distension in small children may cause hypotension.

6. Mention that transport of small children in their car seats with appropriate additional stabilization may be acceptable under certain conditions.

TRAUMA IN THE ELDERLY

STUDENT MANUAL – CHAPTER 18

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Chapter Objectives

Upon completion of this lecture, the student should be able to:

1. Describe the changes that occur with aging, and explain how these changes can affect your assessment of the geriatric trauma patient.

2. Describe the assessment of the geriatric trauma patient.

3. Describe the treatment of the geriatric trauma patient.

Key Lecture Points

1. Review pathophysiology of aging by systems.

2. Stress that when doing field triage, geriatric patients have more injuries and worse outcomes than younger patients who are subjected to the same mechanisms.

3. Review patient assessment, and relate how aging affects assessment and interventions.

4. Discuss potential problems with spinal motion restriction in elderly patients.

TRAUMA IN PREGNANCY

STUDENT MANUAL – CHAPTER 19

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Chapter Objectives

Upon completion of this lecture, the student should be able to:

1. Understand the dual goals in managing the pregnant trauma patient.

2. Describe the physiological changes associated with pregnancy.

3. Understand the pregnant trauma patient's response to hypovolemia.

4. Describe the types of injuries most commonly associated with the pregnant trauma patient.

5. Describe the initial assessment and management of the pregnant trauma patient.

6. Discuss trauma prevention in pregnancy.

Key Lecture Points

1. Cover the general information included in the lecture slides, including the information associated with the various trimesters.

2. Note should be made that the status of the fetus generally depends on the well-being of the mother. Therefore, if the mother has adequate blood volume, blood pressure, and circulation, then the fetus will do well. Use the quote, "Death of the fetus in the trauma situation is most often associated with the death of the mother."

3. Mention that the treatment of shock is the same for pregnant patients as for other patients.

4. Emphasize that the physiological changes of pregnancy may cause delay in the diagnosis of the shock state in the mother.

5. Stress that uterine obstruction of venous blood flow may cause hypotension in the supine patient ("supine hypotension syndrome") and thus must be prevented by rolling the patient or backboard to the left.

6. Note that there is an increased rate of fetal demise 2 or 3 days following major trauma to the mother.

7. Mention that short backboard–type devices may be ineffective as an SMR device in the pregnant patient because of the difficulty with adequately securing the straps. This concern also applies to the very obese patient.

PATIENTS UNDER THE INFLUENCE OF ALCOHOL OR DRUGS

STUDENT MANUAL – CHAPTER 20

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Chapter Objectives

Upon completion of this lecture, the student should be able to:

1. List signs and symptoms of patients under the influence of alcohol and/or drugs.

2. Describe the five strategies you would use to best ensure cooperation during assessment and management of a patient under the influence of alcohol and/or drugs.

3. Describe situations in which you would restrain patients, and tell how to handle an uncooperative patient.

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4. List the special considerations for assessment and management of patients in whom substance abuse is suspected.

Key Lecture Points

1. Review commonly abused drugs and their common signs and symptoms.

2. Review clues of drug use by the patient.

3. Review the pertinent history you should obtain when managing a patient who may be under the influence of drugs.

4. Explain how to interact with a patient who is under the influence of drugs.

5. Explain how to manage the patient who is injured, under the influence, and uncooperative. Be familiar with and discuss your local laws regarding restraining a patient.

CARDIOPULMONARY ARREST IN THE TRAUMA PATIENT

STUDENT MANUAL – CHAPTER 21

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Chapter Objectives

Upon completion of this lecture, the student should be able to:

1. Identify treatable causes of traumatic cardiopulmonary arrest.

2. Describe the proper evaluation and management of the patient in traumatic cardiopulmonary arrest.

3. Identify patients in traumatic cardiac arrest for whom you should withhold resuscitation attempts.

Key Lecture Points

1. Briefly review the causes of cardiopulmonary arrest in the trauma situation.

2. Review the position statements (National Association of EMS Physicians and the American College of Surgeons Committee on Trauma) on withholding or terminating resuscitation of prehospital cardiopulmonary arrest. Discuss any local protocols that impact this decision.

3. Review the guidelines about when to attempt resuscitation and the general management of the trauma arrest.

4. Compare and contrast the management of the trauma arrest to general advanced cardiac resuscitation guidelines.

5. Remind students always to think of hemorrhagic shock, tension pneumothorax, and pericardial tamponade when evaluating the trauma arrest patient.

6. Stress rapid transport of the trauma arrest patient.

STANDARD PRECAUTIONS IN THE PREHOSPITAL SETTING

STUDENT MANUAL – CHAPTER 22

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Chapter Objectives

Upon completion of this lecture, the student should be able to:

1.   Discuss the three most common blood-borne viral illnesses to which EMS providers are likely to be exposed in the provision of patient care.

2.   Discuss the signs and symptoms of tuberculosis, and describe protective measures to reduce possible exposure to it.

3.   Describe precautions EMS providers can take to prevent exposure to blood and other potentially infectious materials (CSF, synovial fluid, amniotic fluid, pericardial fluid, pleural fluid, or any fluid with gross visible blood).

4.   Identify appropriate use of personal protective equipment.

5.   Describe procedures for EMS providers to follow if they are accidentally exposed.

6.   Discuss multidrug-resistant organisms and prevention measures.

7.   List vaccines and immunizations recommended for EMS personnel.

Key Lecture Points

1. Explain that trauma care involves exposure to blood and body fluids, and to the diseases that are spread by these means.

2. Explain the difference between active and passive immunity.

3. Describe the diseases caused by hepatitis B, hepatitis C, and HIV; describe recommendations for postexposure prophylaxis.

4. Discuss tuberculosis and infections by multidrug-resistant organisms, and explain precau-

tions to prevent contracting these diseases.

5. Discuss vaccines and immunizations recommended for EMS personnel.

6. Describe personal protection, and handling and cleaning of items exposed to blood or other potentially infectious materials (OPIM).

7. Describe reporting of exposure to blood or OPIM.

8. Describe multidrug resistant organisms.

SKILL STATION 1: BASIC AND ADVANCED AIRWAY MANAGEMENT

Before beginning, review "Skill Stations" (Chapter 3). Minimum instructors needed: 2.

Objectives

At the conclusion of this station, the student should be able to:

1. Perform the various manual methods of opening the airway.

2. Suction the airway.

3. Insert a nasopharyngeal and oropharyngeal airway.

4. Ventilate using the pocket mask.

5. Ventilate using the bag-valve device.

6. Correctly use a pulse oximeter.

7. Describe the preparations necessary to perform endotracheal intubation.

8. Perform adult and infant orotracheal laryngoscopic intubation.

9. Perform nasotracheal intubation.

10. Use capnography to confirm correct tube placement.

11. Anchor the endotracheal tube.

BASIC AIRWAY MANAGEMENT

Skill 1A: Basic Airway Management

Important Points

1. Show the students how to set up and connect the reducing valve on an oxygen cylinder (review the procedure beforehand).

2. Demonstrate how much easier it is to give adequate ventilation using mouth-to-mask ventilation rather than bag-valve-mask ventilation.

3. Stress that using the reservoir bag with the bag-valve device will double the oxygen concentration to the patient.

4. Stress how to interpret the pulse oximeter reading and also those conditions that make pulse oximeter reading unreliable.

5. If you have time, you may demonstrate new or different equipment.

Equipment List

Item	*Quantity*
CPR mannequin	1 or 2

Portable suction machine with charger	1 or 2
Manual suction device (optional)	1 or 2
Suction tubing	1 or 2
Tonsil suction tips (Yankauer)	1 or 2
Tongue blades	10
Appropriate lubricant	1
Nasopharyngeal airways (various sizes)	1 set
Oropharyngeal airways (various sizes)	1 set
Pocket masks (with supplemental oxygen nipple)	2
Oxygen cylinders	2
Pulse oximeters	1 or 2
Oxygen connecting tubing	3
Reducing valves for cylinders	3
Stands for cylinders	3
Adult bag-valve device with adult face mask	2
Pediatric bag-valve device	1
Children's face masks (various sizes)	1 set
Reservoir bags for bag-valve devices	3

Adult intubation mannequin	1
Pediatric intubation mannequin	1
Assorted endotracheal tubes	3 or 4
Jar of water	1
Tables	2

Procedures

Manual techniques to open the airway

A. Modified jaw thrust

   1. Place your hands on either side of the neck at the base of the skull.

   2. While maintaining in-line stabilization of the neck, push up on the angles of the mandible with your thumbs.

B. Jaw-thrust maneuver

   1. Stabilize the head and neck with your knees, or have your partner stabilize the neck in a neutral position.

   2. Using the index and middle fingers of each hand, grasp the angles of the jaw just below the ear.

   3. Lift gently.

C. Chin lift

1. Stabilize the head and neck with your knees, or have your partner stabilize the neck in a neutral position.

2. Place the fingers on one hand under the chin.

3. With the thumb of the same hand, grasp the chin below the lower lip.

4. Lift gently.

D. Jaw lift (used for inserting oral airway or BIAD)

1. Stabilize the head and neck with your knees, or have your partner stabilize the neck in a neutral position.

2. Place the fingers of one hand under the chin.

3. Insert the thumb of the same hand inside the mouth. Grasp the lower incisors.

4. Lift gently.

Suction of the airway

1. Attach the suction tubing to the portable suction machine.

2. Turn the device on and test it.

3. Insert the suction tube through the nose (soft or whistle tip catheter) or mouth (soft or rigid) without activating the suction.

4. Activate the suction and withdraw the suction tube using circular movements.

5. Repeat the procedure as necessary.

Note: Never suction for more than 15 seconds as air and oxygen are also being suctioned out,

in addition to foreign matter. After suctioning, reoxygenate the patient as soon as possible.

Insertion of pharyngeal airways

A. Nasopharyngeal airway (NPA)

1. Choose the appropriate size. It should be the largest that will fit easily through the external nares. The size of the patient's little finger can be used as a rough guide.

2. Lubricate the tube with a water-based lubricant.

3. Insert it straight back through the right nostril, along the floor of the nose, with the beveled edge of the airway toward the septum.

4. Gently pass it into the posterior pharynx with a slight rotating motion until the flange rests against the nares. If resistance to passage of the NPA is felt, DO NOT FORCE the NPA in, as injury may occur. Remove the NPA and attempt insertion into the left nares.

5. To insert the NPA into the left nostril, turn the airway upside down so that the bevel is toward the septum; then insert straight back through the nostril until you reach the posterior pharynx. At this point, turn the airway 180 degrees and insert it down the pharynx until it lies behind the tongue. If the tongue is occluding the airway, a jaw thrust or chin lift must be performed to allow the NPA to go under the tongue.

B. Oropharyngeal airway (OPA)

1. Choose the appropriate size. Demonstrate how to measure from the corner of the

mouth to the earlobe or angle of the jaw. The presence of a gag reflex is a contraindication to use of an OPA.

2. Open the mouth.

    a. Scissor maneuver

    b. Jaw lift

    c. Tongue blade

3. Insert the airway gently without pushing the tongue back into the pharynx.

    a. Insert the airway under direct vision using a tongue blade. This is the preferred method and is safe for adults and children.

    b. Insert the airway upside down or sideways and rotate into place after tip of the airway passes the tongue. This method should not be used for children.

4. If the OPA causes gagging, remove it and replace it with an NPA.

Use of pocket mask with supplemental oxygen

1. Have your partner stabilize the neck in a neutral position (or apply a good stabilization device).

2. Connect the oxygen tubing to the oxygen cylinder and the mask.

3. Open the oxygen cylinder, and set the flow rate at 15 liters per minute.

4. Open the mouth.

5. Insert an OPA or NPA, if available. Otherwise, use the chin-lift or jaw-thrust maneuver.

6. Place the mask on the face (it should cover the nose and mouth), and establish a good seal. Facial hair, lack of teeth, obesity, or advanced age may make it difficult to get a good seal.

7. Ventilate mouth-to-mask with enough volume (8–12 cc/kg) to cause adequate chest rise. Ventilate at a rate of 8 to 10 breaths per minute. The inspiratory phase should last 1.5 to 2.0 seconds. Let the patient exhale 1.5 to 4.0 seconds.

Use of the bag-mask

1. Stabilize the patient's head in a neutral position.

2. Connect the oxygen, connecting tubing to the bag-mask system and oxygen cylinder.

3. Attach the oxygen reservoir to the bag-mask.

4. Open the oxygen cylinder and set the flow rate at 12 liters per minute.

5. Select the proper size mask and attach it to the bag-mask device.

6. Open the mouth.

7. Insert an OPA (or an NPA, if the patient has a gag reflex).

8. If available, apply capnography cannula or attach an airway adapter between the bag and the mask.

9. Place the mask on the patient's face and have your partner establish and maintain a good seal. Facial hair, lack of teeth, obesity, or advanced age may make it difficult to get a good mask seal.

10. Using both hands, ventilate with about 10 cc/kg (about 750 cc for an adult) of 100% oxygen at a rate of 8 to 10 breaths per minute. If you are getting good bilateral chest rise, you are giving adequate tidal volume. Use capnography to ensure adequate breathing and prevent inadvertent hyperventilation. As a general rule, keep the end-tidal CO_2 ($ETCO_2$) between 35 and 45 mm Hg.

11. If you are forced to ventilate without a partner, use one hand to maintain a face seal and the other hand to squeeze the bag. This decreases the volume of ventilation because less volume is produced by only one hand squeezing the bag.

Use of the bag-mask to ventilate infants (optional)

1. Stabilize the patient's head in a neutral position.

2. Connect the oxygen tubing to the bag-valve system and oxygen cylinder.

3. Attach the oxygen reservoir to the bag-valve mask.

4. Open the oxygen cylinder, and set the flow rate at 12 liters per minute.

5. Select the proper size mask, and attach it to the bag-valve device.

6. Open the mouth.

7. Insert an OPA (or an NPA, if the patient has a gag reflex).

8. Place the mask on the face, and establish and maintain a good seal. You may have to turn the mask upside down to get a good seal.

9. Ventilate with enough volume to make the chest rise. Use about 20 centimeters of water pressure. To experience this amount of pressure, place a 20 cm (#8) endotracheal tube

vertically in water except for the bag connection, and compress the resuscitation bag so that air bubbles come out the tower end of the endotracheal tube. This will be 20 cm of water pressure. Pressures higher than this will always cause some air to be forced into the stomach.

Use of the pulse oximeter

A pulse oximeter is a noninvasive photoelectric device that measures the arterial oxygen saturation and pulse rate in the peripheral circulation. It consists of a portable monitor and a sensing probe that clips onto the patient's finger, toe, or earlobe. The device displays the pulse rate and the arterial oxygen saturation in a percentage value (% SaO_2). This very useful device should be used on all patients with any type of respiratory compromise. The pulse oximeter is useful to assess the patient's respiratory status, the effectiveness of oxygen therapy, and the effectiveness of bag-mask or flow-restricted oxygen-powered ventilation device (FROPVD) ventilation. Remember that the device measures percent of oxygen saturated hemoglobin.

The hemoglobin molecule is so efficient at carrying oxygen that it is 90% saturated (90% SaO_2) when the partial pressure of oxygen is only 60 mm Hg (100 is normal). If you are used to thinking about PaO_2 (where 90–100 mm Hg is normal), then you may be fooled into thinking that an SaO_2 reading (pulse oximeter) of 90% is normal when it is actually critically low. As a general rule, any pulse oximeter reading below 92% is cause for concern and requires some sort of intervention (such as opening the airway, suction, oxygen, assisted ventilation, intubation, decompression of tension pneumothorax). A pulse oximeter reading below 90% is critical and requires immediate intervention to maintain adequate tissue oxygenation. Try to

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maintain a pulse oximeter reading above 95%. However, do not withhold oxygen from a patient with a pulse oximeter reading above 95% who also shows signs and symptoms of hypoxia or difficulty breathing.

The following are conditions that make the pulse oximeter reading unreliable:

- Poor peripheral perfusion (shock, vasoconstriction, hypotension). Do not attach the sensing probe onto an injured extremity. Try not to use the sensing probe on the same arm that you are using to monitor the blood pressure. Be aware that the pulse oximeter reading will go down while the blood pressure cuff is inflated.

- Severe anemia or exsanguinating hemorrhage.

- Carbon monoxide poisoning. This will give falsely high readings because the sensing probe cannot distinguish between oxyhemoglobin and carboxyhemoglobin. If suspected, one must use a specific monitor and sensor to measure levels.

- Hypothermia.

- Excessive patient movement.

- High ambient light (bright sunlight, high-intensity light on area of the sensing probe).

- Nail polish or a dirty fingernail, if you are using a finger probe. Use acetone to clean the nail before attaching the probe.

- Cyanide poisoning. Cyanide poisons at the cellular level by preventing the cells from using oxygen to make energy. Because the body is using no oxygen, the circulating blood will usually be 95% to 100% saturated. The patient will still be dying from lack of oxygen (at the cellular level).

Procedure

Turn on the device.

1. Clean the area (earlobe, fingernail, and toenail) that you are to monitor.

2. Attach the sensing clip to the area.

3. Note the reading on the device.

Skill 1B: Assisting with Advanced Airway Management

Note: This skill is taught only to basic level students taking the ITLS course. It consists of

1. Preparation for endotracheal intubation (see Skill 1C)

2. Procedure for assisting with orotracheal and nasotracheal intubation (see below)

3. Confirmation of tube placement (see Skill 1E)

4. Anchoring the tube (see Skill 1F)

Equipment

The same as for Skill 1D.

Procedure

1. Following ventilation and initial preparations, the student should hold the patient's head and/or perform the Sellick maneuver. The student should count slowly aloud to 30 as the ALS provider performs the intubation.

2. When the tube is inserted, the student (or the ALS provider) should check the tube for

placement by the confirmation protocol (Skill 1E).

3. When the tube placement is confirmed, the student should anchor the tube (Skill 1F).

ADVANCED AIRWAY MANAGEMENT

These skills are taught only to advanced level students taking the ITLS course.

Skill 1C: Preparation for Endotracheal Intubation

Whatever the method of intubation used, both patients and rescuers should be prepared for the procedure. The following are considered basic to all intubation procedures:

- *Gloves.* Latex or nitrile examining (not necessarily sterile) gloves should be worn for all intubation procedures.

- *Eye protection.* Providers must wear goggles or face shield.

- *Oxygenation.* All patients should be ventilated by way of a bag-mask or should breathe high-flow oxygen (12 liters per minute) for several minutes prior to the attempt. This will "wash out" residual nitrogen in the lungs and decrease the risk of hypoxia during the intubation process.

- *Equipment.* Check all equipment, and keep at hand in an organized kit. For laryngoscopic intubation, the endotracheal tube should be held in a "field hockey stick" or open "J" shape by a malleable stylet that is first lubricated and inserted until the distal end is just proximal to the side hole of the endotracheal tube. Check the cuff of the endotracheal tube by inflating it with 10 cc of air. Completely remove the air and leave the syringe filled with air attached to

the pilot tube. Lubricate the cuff and distal end of the tube.

- *Capnography.* Have the unit turned on and the waveform visible on the monitor. Record the baseline waveform and CO_2 levels while oxygenating the lungs prior to intubation.

- *Suction.* Suction must be immediately at hand.

- *Assistant.* An assistant (maybe an EMT-B or first responder) should be available to help in the procedure and may apply the Sellick maneuver to reduce gastric insufflation and risk of aspiration, during ventilation and the subsequent intubation attempt. The assistant also may help hold the head and neck in a neutral position or perform external laryngeal manipulation to help make the cords visible to the intubator. Some intubators prefer the assistant to count aloud to 30 during the intubation procedure. You may prefer to simply hold your breath (when you need to breathe, the patient really needs a breath) while performing intubation.

Optional Preparation

- *Lidocaine.* Topical Lidocaine sprayed into the posterior pharynx before intubation attempts can decrease the adverse cardiovascular and intracranial pressure effects of the intubation procedure.

Skill 1D: Laryngoscopic Orotracheal Intubation

Important Points

1. Check batteries and all laryngoscope lights.

2. Because this is a trauma course, cervical collars should be applied to the intubation manne-

quins so the students can learn to intubate without extending the neck. Have one student stabilize the neck from below while another intubates.

3. Require the students to follow the procedure as outlined in the text. The suction machine can be simulated, but the tubing and suction tip should be placed next to the patient each time intubation is practiced.

Equipment List

Item	*Quantity*
Adult intubation mannequins	2
Infant intubation mannequins	2
Adult cuffed ET tubes	
7 mm	2
8 mm	2
9 mm	2
Pediatric ET tubes (not cuffed)	
3.5 mm	2
4.0 mm	2
4.5 mm	2
Wire guides for adult ET tubes	2
Wire guides for pediatric tubes	2

Laryngoscope handles	4
Spare batteries for laryngoscopes	8
Spare bulbs for laryngoscopes	4
Adult laryngoscope blades	
Curved	2
Straight	2
Pediatric laryngoscope blades	
Straight	2
Appropriate lubricant	1
10-cc syringes	2
Lighted stylet (optional)	2
Oral airways (size to fit adult mannequin)	2
Oral airways (size to fit infant mannequin)	2
Tonsil suction tip (Yankauer) and suction tubing	4 each
Bag-valve devices	4
Nonsterile rubber gloves	1 box
Face shields or goggles	4
CO_2 detector (optional)	1

Esophageal detection device (optional)	1
Pulse oximeter and capnography unit	1 each
Bougie (tracheal tube introducer)	1 (op-tional)

Procedure: Adult Endotracheal Intubation

In this method, the upper airway and the glottic opening are visualized, and the tube is slipped gently through the cords. Its advantages include the ability to see obstructions and to visualize the accurate placement of the tube. It has the disadvantage of requiring a relatively relaxed (unconscious) patient without anatomic distortion and with minimal bleeding or secretions.

1. Stabilize the neck in a neutral position from below (done by your partner).

2. While the patient is being ventilated, prepare your equipment:

   a. Be sure suction apparatus is available and functioning.

   b. Select the correct size ET tube, insert a wire guide, attach a 10-cc syringe, and test the cuff.

   c. Connect the laryngoscope blade and handle. Test the light.

   After ventilation and initial preparations, the following steps should be carried out:

1. An assistant stabilizes the head and neck, performs the Sellick maneuver, and counts slowly aloud to 30 (at your request).

2. In the supine patient, lift the chin and slide the blade into the right side of the patient's

mouth. Push the tongue to the left and "inch" the blade down along the tongue in an attempt

to see the epiglottis. A key maneuver must be performed here: The blade must pull forward

(up) on the tongue to lift up the epiglottis and bring it into view.

3. Use the laryngoscope blade to lift the tongue and epiglottis up and forward in a straight line.

"Levering" the blade is a common error novices make and can result in broken teeth and oth-

er trauma. The laryngoscope is essentially a "hook" to lift the tongue and epiglottis up and

out of the way so that the glottic opening can be identified. Remember that the Miller

(straight) blade is used to lift the epiglottis directly, whereas the Macintosh (curved) blade is

inserted into the vallecula and lifts the epiglottis indirectly.

4. Advance the tube along the right side of the oropharynx once the epiglottis is seen. When the

glottic opening (or even just the arytenoid cartilages) is identified, pass the tube through to a

depth of about 5 cm beyond the cords.

5. For difficult intubations where you cannot see the cords or where the angle is such that it is

difficult to get the tube through the cords, a bougie or tracheal tube introducer can be very

helpful. Insert the bougie through the cords and then slip the tube over the bougie and slide it

down through the cords. This technique works best when the intubator keeps the blade in-

serted and the assistant threads the ET tube on to the bougie and holds the end of the bougie.

The intubator then threads the ET tube down the bougie through the cords. By maintaining

direct visualization, the chance of the ET tube becoming caught on the tongue or epiglottis is

reduced. Then remove the bougie.

6. If still having difficulty visualizing the vocal cords, the intubator must take his right hand and,

using gentle pressure, manipulate the thyroid (laryngeal) cartilage to bring the vocal cords in-

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to view. This process is known as *external laryngeal manipulation (ELM).* The assistant is then instructed to maintain the positioning of the cartilage, and the intubator passes the tube.

7. While the tube is still held firmly, inflate the cuff with 4 to 6 cc of air and begin ventilation.

8. Insert an oral airway.

9. Check the tube for placement by the immediate confirmation protocol and secure it in place. If possible, placement should be reconfirmed using capnography.

10. Begin ventilation using adequate oxygen concentration and tidal volume.

Procedure: Infant Endotracheal Intubation

Follow the same procedure as for adults, except that there is no cuff to inflate.

Skill 1E: Immediate Confirmation of Tube Placement

One of the greatest challenges of intubation is ensuring the correct intratracheal placement of endotracheal tubes. An unrecognized esophageal intubation is a lethal complication of this life-saving procedure. Every effort must be made to avoid this catastrophe, and a strict protocol must be followed to reduce the risk.

Although the most reliable method of ensuring proper placement is actually visualizing the tube passing through the glottic opening, even this is not 100% sure. The gold standard for confirming and monitoring endotracheal tube placement is waveform capnography (see below). If you do not have capnography available, the following protocol can be used but is not reliable. When you use this protocol, you should recognize the unreliable nature of auscultation as the

sole method of confirming intratracheal placement. Correct intratracheal placement should be suspected from the following initial signs:

1. An anterior displacement of the laryngeal prominence is visible as the tube is passed distally.

2. There is coughing, bucking, or straining on the part of the patient.

Note: Phonation (any noise made with the vocal cords) is ABSOLUTE EVIDENCE THAT THE TUBE IS IN THE ESOPHAGUS, AND THE TUBE SHOULD BE REMOVED IMMEDIATE-LY.

3. There is normal compliance with bag ventilation. (The bag does not suddenly "collapse," but rather there is some resilience to it and resistance to lung inflation.)

4. No cuff leak is seen after inflation. (Persistent leak indicates esophageal intubation until proven otherwise.)

5. Adequate chest rise occurs with each ventilation.

6. There is breath condensation on the tube with each ventilation—this is not 100% reliable, but it is very suggestive of intratracheal placement.

The following procedure should then be carried out immediately to prove correct placement:

1. Auscultate three sites:

    a. Epigastrium (perhaps the most important site) should be silent, with no sounds heard.

    b. Right and left midaxillary lines.

2. Inspect for full movement of the chest with ventilation.

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3. Check position using suction bulb or syringe aka esophageal detector device (EDD) or one of the CO_2 detecting devices.

4. Watch for any change in the patient's color or in the pulse oximeter reading. Also observe the ECG monitor for changes.

When you perform the Secondary Survey, or when there is a question of correct tube placement after the above confirmation protocol, you should do the following:

1. Auscultate six sites:

    a. Epigastrium—should be silent with no sounds heard

    b. Right and left apex

    c. Right and left midaxillary lines

    d. Sternal notch—"tracheal" sounds should be readily heard here

2. Inspect the chest for full movement of the chest with ventilation.

3. Gently palpate the tube cuff in the sternal notch while compressing the pilot balloon between the index finger and thumb. A pressure wave should be felt in the sternal notch.

4. Use adjuncts such as CO_2 detectors (capnographic or colormetric), esophageal detector device, or lighted stylet. (*Note:* Because a misplaced endotracheal tube is a fatal error, there is a trend now for the immediate use of capnography to confirm tube placement in every endotracheal intubation.)

Confirming and Monitoring ET Tube Placement with Capnography

1. Prepare all equipment for intubation. Turn on monitor and attach capnography filter line or wires to the monitor. (This will vary depending on the brand of capnograph.) It is advisable to apply and record baseline capnography during preoxygenation prior to intubation attempt.

2. Place the endotracheal tube and inflate the cuff. In cases of arrest, compressions should not be interrupted to perform this procedure.

3. Attach the capnography airway adapter on the endotracheal tube, and then attach the bag-mask to the airway adapter.

4. Ventilate the patient, and observe the waveform. The presence of a "square" pattern confirms tracheal placement (see Figure 5-16 in the textbook). Print out the waveform, if possible (for documentation). If the waveform is nonexistent or appears in gross and irregular waveform patterns, the tube is possibly in the esophagus or hypopharynx. In pediatrics, small tube size may limit CO_2 readings because some air may go around the tube and, thus, is not detectable by the capnogram. Use a cuffed tube in those cases and the waveform and CO_2 readings should improve.

5. Listen for breath sounds midaxillary on each side to rule out right mainstem intubation.

6. Secure the tube and continually monitor the waveforms during transport.

7. On arrival at the receiving facility, print out another waveform (if available) to prove correct placement at the time of patient transfer.

8. On your run report, document the visualization of the vocal cords, attach the waveform printout(s) or document the presence, and document equal breath sounds.

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Troubleshooting While Monitoring

- *Loss of waveform completely.* Apnea, tube is dislodged or obstructed, or air may be leaking around the cuff.

- *Waveforms and values getting smaller.* Hyperventilation (check the depth and rate of ventilation) or hypoperfusion (shock, or loss of pulses).

Skill 1F: Anchoring the Tube

Anchoring an endotracheal tube can be a frustrating exercise. Not only does it require some fine movements of the hands when you appear to be all thumbs, but it is also difficult to perform this task when ventilation, movement, or extrication is being carried out. Keep one thing in mind: There is no substitute for the human anchor. That is, one person should be held responsible for ensuring that the tube is held fast and that it does not migrate in or out of the airway. To lose a tube can be a catastrophe, especially if the patient is inaccessible or the intubation was a difficult one to begin with.

Fixing the endotracheal tube in place is important for several reasons. First, movement of the tube in the trachea will produce more mucosal damage and may increase the risk of postintubation complications. In addition, movement of the tube will stimulate the patient to cough, strain, or both, leading to cardiovascular and intracranial pressure changes that could be detrimental. Most important, there is a greater risk in the prehospital setting of dislodging a tube and losing control of the airway if it is not anchored solidly in place.

The endotracheal tube can be secured in place by either tape or a commercially available holder. Although taping a tube in place is convenient and relatively easily done, it is not always

effective. There is often a problem with the tape sticking to skin wet with rain, blood, airway secretions, or vomitus. If you are using tape, several principles should be followed:

- Insert an oropharyngeal airway to prevent the patient from biting down on the tube.

- Dry the patient's face and apply tincture of benzoin to better ensure proper adhesion of the tape.

- Carry the tape right around the patient's neck when anchoring the tube. Do not move the neck. Do not tie it so tight that it occludes the external jugular veins.

- Anchor the tube at the corner of the mouth, not in the midline.

Because of the difficulty of fixing the tube in place with tape, it may be better to use a commercial endotracheal tube holder that uses a small rubber strap to fix the tube in a plastic holder, which also acts as a bite block. Pass a second rubber strap around the patient's neck. Although this is not an ideal solution, it is easier to use and more quickly applied. If tube holders with VELCRO® are used, care must be taken not to get the small hooks embedded in the fingers or in the patient's lips.

Because flexion or extension of the patient's head can move the tube in or out of the airway by 2 or 3 cm, it is a good practice to restrict head and neck movement of any patient who has an endotracheal tube in place. If the patient is spinal motion-restricted because of the risk of cervical-spine injury, flexion and extension should be less of a concern. However, in those who do not have a collar in place, it is best to tape the head to the backboard or stretcher in order to restrict movement. Failing this, the airway manager is required to ensure that the head and neck are kept in a neutral position.

Skill 1G: Nasotracheal Intubation

Indications

As with all advanced procedures, this technique must be accepted local protocol and you must have permission from medical direction before performing it. Indications for performing na-sotracheal intubation in the field setting are as follows:

- A patient who needs endotracheal intubation but who has a possible cervical-spine injury

- A patient who needs endotracheal intubation but who has clenched jaws

- A patient who needs endotracheal intubation (respiratory distress secondary to large flail chest, open chest wound, blunt trauma to the neck, etc.) but who has a gag reflex

- A patient who needs endotracheal intubation but who is trapped and you are unable to get into a position to use a laryngoscope

Contraindications

Contraindications to this procedure are as follows:

Absolute Contraindications

- Trauma to the face or nose with possible basilar skull fracture (blood or fluid draining from the nose, facial fractures, and/or raccoon eyes). There is danger of inserting the tube into the cranial vault in this instance.

- Patients taking anticoagulant medication.

- Children under the age of 10 years.

Relative Contraindication

It is almost impossible to perform nasotracheal intubation on the patient who is not breathing.

You need the sound of the patient's breathing to guide the tube.

Complications

- Trauma to the nose or airway resulting in hemorrhage and possible aspiration

- Esophageal intubation, leading to hypoxia and death

- Induction of vomiting, leading to aspiration, hypoxia, and death

- Right mainstem bronchus intubation

- Inability to intubate, leading to hypoxia and death

- Trauma to the vocal cords

Equipment

Use the same equipment listed for routine adult endotracheal intubation, except modify the adult

intubation mannequin by removing one "lung" and attaching a bag-valve device to simulate

breath sounds.

Preparation for Intubation

The greatest disadvantage of the nasotracheal route of endotracheal intubation is its relative difficulty, depending as it does on the appreciation of the intensity of the breath sounds of spontaneously breathing patients. It is a blind procedure and as such requires extra skill and care to successfully perform proper intratracheal placement.

Guidance of the tube through the glottic opening is a question of your perceiving the intensity of the sound of the patient exhaling. You can, with some difficulty, guide the tube toward the point of maximum intensity and slip it through the cords. You can better hear and feel breath sounds with your ear placed against the proximal opening of the tube or, even better, use of an adjunct such as the Burden nasoscope (see Figure 5-7 in the textbook).

The success of this method will also depend on an anterior curve to the tube that will prevent its passing into the esophagus. Prepare two tubes prior to carrying out the intubation attempt. Insert the distal end of the 7-mm tube into its proximal opening, thus molding it into a formed circle. Preparing two tubes allows the immediate use of the second, more rigid tube should the first plastic tube become warm with body temperature, thus losing its anterior curve. Displacing the tongue and jaw forward also can help in achieving placement because this maneuver lifts the epiglottis anteriorly out of the way of the advancing tube.

Procedure

1. Perform routine preparation procedures as described in endotracheal intubation.

2. Lubricate the cuff and distal end of a 7.0-mm or 7.5-mm endotracheal tube. With the bevel against the floor or septum of the nasal cavity, slip the tube distally through the larger naris.

3. When the tube tip reaches the posterior pharyngeal wall, take great care on "rounding the bend," and then direct the tube toward the glottic opening.

4. By watching the neck at the laryngeal prominence, you can judge the approximate placement of the tube. Tenting of the skin on either side of the prominence indicates the tube is caught up in the pyriform fossa, a problem solved by slight withdrawal and rotation of the tube to

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the midline. Bulging and anterior displacement of the laryngeal prominence usually indicate that the tube has entered the glottic opening and has been correctly placed. At this point the patient, especially if not deeply comatose, will cough, strain, or both. This may be alarming to the novice intubator, who might interpret this as laryngospasm or misplacement of the tube. The temptation may be to pull the tube and ventilate because the patient may not breathe immediately. Holding your hand or ear over the opening of the tube to detect airflow may reassure you that the tube is correctly placed, and you may inflate the cuff and begin ventilation.

5. Confirm tube placement using the immediate confirmation protocol.

SKILL STATION 2: SPINE MANAGEMENT SKILLS I

Short SMR Devices/Emergency Rescue and Rapid Extrication

Skill 2A: Spine Management—Short SMR Devices

Before beginning, review "Skill Stations" (see Chapter 3). Minimum instructors needed: 1.

Objectives

At the conclusion of this station, the student should be able to:

1. Explain when to use spinal motion restriction (SMR).

2. Perform SMR with a short device.

3. Perform rapid extrication and emergency rescue.

Important Points

1. The time allowed (30 minutes) to teach this station is very short. You must get started immediately.

2. Most physicians are not taught this skill. It is best to have an experienced EMT teach this station.

3. Do not lecture; demonstrate. Show the students where to put their hands and have them perform the techniques.

4. Weather permitting, this station should be taught outside using a vehicle rather than a chair.

Equipment List

Item	Quantity
Live model	1
Rigid cervical collar	1
Short backboard with straps	1
Long backboard with straps	1
KED or similar vest-type extrication device	1
Head immobilization device	1
Kerlix roll or towels to pad neck	2
Wide adhesive tape	2 rolls

| Elastic wraps (ACE) 6″ | 2 |
| Chair or vehicle | 1 |

Procedures

Who should receive spinal motion restriction (SMR)?

- Any trauma patient with obvious neurological deficit such as paralysis, weakness, or paresthesia (numbness or tingling)

- Any trauma patient who complains of pain in the neck or back

- Any trauma patient who is unconscious

- Any trauma patient who may have injury to the spine but in whom evaluation is difficult due to altered mental status (e.g., drugs, alcohol)

- Any unconscious patient who may have been subjected to trauma

- Any patient who has a positive mechanism of injury (see Spinal Trauma chapter in textbook)

- When in doubt, use SMR

When to Use SMR

Patients requiring SMR must be addressed before they are moved at all. In the case of a motor-vehicle collision, the patient must receive SMR before being removed from the wreckage. More movement is involved in extrication than at any other time, so SMR must be accomplished before beginning extrication.

Technique of SMR Using the Short SMR Devices

This device is for use with a patient who is not critical and who is in a position (such as a vehicle) that does not allow use of the long backboard. There are several different devices of this type; some devices have different strapping mechanisms than the one explained here. You must become familiar with equipment you will employ before using it in actual patient situations.

Remember that the routine priorities of assessment and management are done before the SMR devices go on.

1. One rescuer must, if possible, station himself or herself behind the patient, place his or her hands on either side of the patient's head, and manually maintain the neck in a neutral position. This step is part of the ABCs of assessment. It is done at the same time that you begin assessment of the airway.

2. When you have the patient stable enough to begin SMR, you must apply a rigid cervical collar. If you have enough people, this can be done while someone else is doing the ABCs of assessment and management. If you have limited help, apply the collar after finishing the rapid trauma survey but before transferring the patient to the long backboard.

3. Position the device behind the patient. The first rescuer continues to manually maintain the neck in a neutral position while the short device is being maneuvered into place. The patient may have to be moved forward to get the device in place; great care must be taken so that moves are coordinated to support the neck and back.

4. Secure the patient to the device with the straps that are supplied. Place the short strap under the armpits and across the upper chest as an anchor. Bring each long strap over a leg,

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down between both legs, back around the outside of the same leg, and then across the chest. Then attach each to the opposite upper strap that was brought across the shoulders.

5. Tighten the straps until the patient is held securely.

6. Secure the patient's head to the device using wide tape or elastic wraps around the forehead. Apply padding under the neck and head as needed to maintain a neutral position.

7. Transfer the patient to a long backboard. Turn the patient so that his or her back is to the opening through which he or she is to be removed. Someone must support the legs so that the upper legs remain at a 90-degree angle to the torso. Position the long backboard through the opening until it is under the patient. Lower the patient back onto the long backboard, and slide the patient and the short device up into position on the long backboard. Loosen the straps on the device, allow the patient's legs to extend out flat, and then retighten the straps. Now secure the patient to the long board with straps, and secure the head with a padded head device. When the patient is secured in this way, it is possible to turn the whole unit on its side if the patient has to vomit. The patient should remain secure.

Important Points to Remember

1. When you are placing the straps around the legs on a male, do not catch the genitals in the straps.

2. Do not use the short board as a "handle" to move the patient. Move both patient and device as a unit.

3. When you are applying the horizontal strap (long backboard) around a female, place the up-

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per strap above her breasts, not across them.

4. When you are applying the lower horizontal strap on a pregnant patient, see that it is low enough so as not to injure the fetus.

5. You may need to modify how you attach the straps, depending on injuries.

6. Secure the patient well enough so that no motion of the spine will occur if the board is turned on its side. Do not tighten the straps so tight that they interfere with breathing.

Skill 2B: Emergency Rescue and Rapid Extrication

Before beginning, review "Skill Stations" (see Chapter 3). Minimum instructors needed: 1.

Objectives

At the conclusion of this station, the student should be able to:

1. Explain the indications for emergency rescue and rapid extrication.

2. Demonstrate the techniques of emergency rescue and rapid extrication.

Important Points

1. The time allowed for this station is very short, so you must begin immediately.

2. Most physicians are not taught this skill. It is best to assign an experienced EMT to teach this station.

Equipment List

Item	Quantity
Item	*Quantity*
Live model	1
Long backboard with straps	1
Rigid cervical collar	1
Head immobilization device	1
Wide adhesive tape	2 rolls
Chair or vehicle	1

Situations Requiring Emergency Rescue or Rapid Extrication

There are two kinds of situations in which you should perform abbreviated extrication. The first of these is an emergency rescue in any situation in which your scene size-up identifies a condition that *immediately* endangers you and your patient. *Immediately* means you may not even have the seconds required to perform an organized rapid extrication and are reduced to simply grabbing and pulling the patient to safety with no regard for spinal precautions. Examples of such situations include

1. Fire or immediate danger of fire or explosion

2. Hostile environment, gunfire, or other weapons

3. Danger of being carried away by rapidly moving water

4. Structure in immediate danger of collapse

5. Continuing and immediate life-threatening toxic exposure

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When performing an emergency rescue, try to drag the patient along the long axis of the body. Above all, get your patient and yourself to safety. Whenever you use this procedure, it should be noted in the written report, and you should be prepared to explain your actions at a review by your medical direction physician.

The second kind of situation is a rapid extrication in which the initial exam of the patient identifies any condition that requires an *immediate intervention* that cannot be done in the vehicle or other structure. Generally these situations allow you to take the seconds required to do an organized rapid extrication. Examples include

1. Airway obstruction that is not relieved by jaw thrust or finger sweep

2. Cardiac or respiratory arrest

3. Chest or airway injuries requiring ventilation or assisted ventilation

4. Late shock or bleeding that cannot be controlled

Rapid extrication is to be used only in a situation in which the patient's life is in immediate danger. Whenever you use this procedure, it should be noted in the written report, and you should be prepared to explain your actions at a review by your medical direction physician.

Procedures

1. One rescuer must, if possible, station himself or herself behind the patient, place his or her hands on either side of the patient's head, and manually maintain the neck in a neutral position. This step is part of the ABCs of assessment. It is done at the same time that you begin assessment of the airway.

2. Do a rapid trauma survey; then apply a cervical collar. You should have the collar with you when you begin.

3. If your rapid trauma survey of the patient reveals an immediate life-threatening situation, go to the rapid extrication technique. This requires at least four, and preferably five or six, rescuers to perform it well.

4. Immediately slide the long backboard onto the seat and, if possible, at least slightly under the patient's buttocks.

5. A second rescuer stands close beside the open door of the vehicle and takes over maintaining the cervical spine.

6. The first rescuer or another rescuer is positioned on the other side of the front seat ready to rotate the patient's legs around.

7. Another rescuer is positioned at the open door beside the patient. By holding the upper torso, he or she works together with the rescuer, holding the legs to turn the patient carefully.

8. The patient is turned so that his or her back is toward the backboard. The legs are lifted and the back is lowered to the backboard. The neck and back are not allowed to bend during this maneuver.

9. Using teamwork, the patient is carefully slid to the full length of the backboard while the legs are carefully straightened.

10. The patient is then moved immediately away from the vehicle (to the ambulance if available), and resuscitation is begun. The patient is secured to the long backboard as soon as possible.

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SKILL STATION 3: TRACTION SPLINTS

Before beginning, review "Skill Stations" (see Chapter 3). Minimum instructors needed: 1.

Objectives

At the conclusion of this station, the student should be able to:

1. Explain when to use a traction splint.

2. Describe the complications of using a traction splint.

3. Apply the most common traction splints:

    a. Thomas splint

    b. Hare splint

    c. Sager splint

Important Points

1. The time allowed (30 minutes) is very short. Begin immediately so that each student has time

    to practice.

2. Most nurses and doctors are not trained in use of traction splints. It is best to assign an expe-

    rienced EMT to teach this station.

3. Stress when to use traction splints. Make sure the students know that load-and-go patients do

    not have traction splints applied before transport unless the ambulance has not arrived.

4. You do not have to teach every one of the various traction splints. Teach what is commonly

    used in your area. There is usually time to practice with at least two types.

5. Do not lecture; demonstrate. Show the students where to put their hands, and have them practice the techniques.

Equipment List

Item	*Quantity*
Thomas splint	1
At least one of the following splints:	
Sager or Hare	
Live models (may use students)	2
Cravats for padding	10
Tongue blades (for Spanish windlass)	10
Adhesive tape (1 inch)	1 roll

Procedures

Traction splints are designed to immobilize fractures of the femur. They are not useful for fractures of the hip, knee, ankle, or foot. Applying firm traction to a fractured or dislocated knee may tear the blood vessels behind the knee. If there appears to be a pelvic fracture, you cannot use a traction splint, because it may cause further damage to the pelvis. Fractures below the midthigh that are not angulated or severely shortened may just as well be immobilized by a variety of other splints, such as air splints or the antishock garment. Traction splints work by applying a padded device to the back of the pelvis (ischium) or to the groin. A hitching device is then applied to

the ankle, and countertraction is applied until the limb is straight and well immobilized. The splints must be applied to the pelvis and groin very carefully to prevent excessive pressure on the genitalia. Care must also be used when attaching the hitching device to the foot and ankle so as not to interfere with circulation. To prevent any unnecessary movement, traction splints should not be applied until the patient is on a long backboard. If the splint extends beyond the end of the backboard, you must be very careful when moving the patient and when closing the ambulance door. You must check the circulation in the injured leg, so remove the shoe before attaching the hitching device. In every case, at least two rescuers are needed. One must hold steady, gentle traction on the foot and leg while the other applies the splint. When dealing with load-and-go situations, the splint should not be applied until the patient is in the ambulance and transport has begun (unless the ambulance has not arrived).

Thomas Splint (Half-Ring Splint)

1. Have your partner support the leg and maintain gentle traction while you cut away the clothing and remove the shoe and sock to check pulse and sensation at the foot.

2. Position the splint under the injured leg. The ring goes down, and the short side goes to the inside of the leg. Slide the ring snugly up under the hip, where it will be pressed against the ischial tuberosity.

3. Attach the top ring strap.

4. Apply padding to the foot and ankle.

5. Apply the traction hitch around the foot and ankle.

6. Maintain gentle traction by hand.

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7. Attach the traction hitch to the end of the splint.

8. Increase traction by Spanish windlass action using a stick or tongue depressors.

9. Position two support straps above the knee and two below the knee.

10. Release manual traction, and reassess circulation and sensation.

11. Support the end of the splint so that there is no pressure on the heel.

Hare Splint

1. Position the patient on the backboard or stretcher.

2. Have your partner support the leg and maintain gentle traction while you cut away the clothing and remove the shoe and sock to check pulse and sensation at the foot.

3. Using the uninjured leg as a guide, pull the splint out to the correct length.

4. Position the splint under the injured leg. The ring goes down, and the short side goes to the inside of the leg. Slide the ring up snugly under the hip against the ischial tuberosity.

5. Attach the ischial strap.

6. Apply the padded traction hitch to the ankle and foot.

7. Attach the traction hitch to the windlass by way of the S hook.

8. Turn the ratchet until the correct tension is applied.

9. Reassess PMS of the leg.

10. Position and attach two support straps above the knee and two below the knee. Do not place over fracture site.

11. Release manual traction, and recheck circulation and sensation.

12. To release mechanical traction (when too tight or when removing the splint), pull the ratchet knob outward and then slowly loosen.

Sager Splint

This splint is different from the Thomas and Hare splints in several ways. It works by providing countertraction against the pubic ramus and the ischial tuberosity medial to the shaft of the femur; thus, it does not go under the leg. The hip does not have to be slightly flexed as with the Hare and Thomas splints. The Sager is lighter and more compact than other traction splints. You can also splint both legs with one splint if needed. The new Sager splints are significantly improved over older models and may represent the state of the art in traction splints.

1. Position the patient on a long backboard or stretcher.

2. Have your partner support the leg and maintain gentle traction while you cut away the clothing and remove the shoe and sock to check pulse and sensation at the foot.

3. Using the uninjured leg as a guide, pull the splint out to the correct length.

4. Position the splint to the inside of the injured leg with the padded bar fitted snugly against the pelvis in the groin. The splint can be used on the outside of the leg, using the strap to maintain traction against the pubis. Be very careful not to catch the genitals under the bar (or strap).

5. While maintaining gentle manual traction, attach the padded hitch to the foot and ankle.

6. Extend the splint until the correct tension is obtained.

7. Apply the elastic straps to secure the leg to the splint. Do not place over fracture site.

8. Release manual traction, and recheck circulation and sensation.

SKILL STATION 4: SPINE MANAGEMENT SKILLS II

Helmet Management/Log Roll/Long Backboard

Before beginning, review "Skill Stations" (see Chapter 3). Minimum instructors needed: 1.

Objectives

At the conclusion of this station, the student should be able to:

1. Demonstrate log rolling a patient onto a long backboard.

2. Demonstrate securing a patient to a long backboard.

3. Demonstrate spinal motion restriction (SMR) for a patient from a standing position.

4. Demonstrate SMR when a neutral position cannot safely be obtained.

5. Explain which patients should have helmets removed in the field and which patients should

   have helmets stabilized in place.

6. Demonstrate how to remove a helmet properly.

7. Demonstrate proper SMR of a patient who is wearing shoulder pads and a helmet.

Important Points

1. The time allowed (30 minutes) is very short. You must begin immediately.

2. If groups are large enough (six members), it is best to divide the students into two teams: one to practice log rolling and helmet management and one to practice securing the patient to the long backboard. You will need a second instructor if you do this.

3. You should review the differences in immobilizing and transporting a pregnant patient.

4. Review the use of padding under the shoulders or torso to maintain a neutral spinal position in children and some elderly patients. It would be useful to have a child or a child mannequin for the students to use in practice.

5. Be sure that students understand that there is some regional variation in who gives the order to roll (rescuer at the head or rescuer at the shoulder). You may use the local preference.

6. The introduction of the vacuum backboard has made several of these techniques much easier. You may want to demonstrate this device in this station.

Equipment List

Item	Quantity
Live model (may use student)	1 or 2
Rigid cervical collar	2
Reeves sleeve (optional)	1
Miller body splint (optional)	1
Vacuum backboard (optional)	1

Long backboard with straps (or strap system)	2
Towels for padding head and neck	4
Cushion-type head immobilizer (optional)	1
Blanket roll	1
Wide adhesive tape	4 rolls
Motorcycle helmet (full face)	1
Football helmet with face protector	1
Shoulder pads	1 set
Open-face helmet	1

Helmet Management

Important Points

1. Patients wearing both shoulder pads and a helmet:

   a. Patients who are wearing both shoulder pads and a helmet will usually have their cervical spines maintained in a more neutral position by leaving the helmet in place and padding and taping the helmet to the backboard to act as a head immobilizer. Football helmets usually fit very snugly and make an excellent head immobilizer. They usually raise the head just enough to match the elevation of the shoulders by the shoulder pads. If the face protector must be removed to manage the airway, it can be easily done with a screwdriv-

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er, pruning shears, or one of the commercial face mask removers. The team equipment manager usually has the proper tools to immediately remove face protectors.

   b. If a patient wearing a helmet and shoulder pads has already had the helmet removed by the time you arrive, or if the helmet must be removed for some reason, you will usually have to place padding under the head to keep the neck in a neutral position.

2. Patients wearing a helmet but no shoulder pads:

   a. Patients with helmets but no shoulder pads will usually have their necks in a flexed position unless the helmet is removed or padding is placed under the shoulders. It is better to remove the helmet.

   b. Motorcycle helmets are usually looser than sports helmets and thus may allow the head to move around inside the helmet. Such helmets do not make good head immobilizers when padded and taped to the backboard.

   c. Because patients come in all shapes and sizes, there may be instances in which the patient's neck may be in a more neutral position with the helmet in place. Use judgment in such cases.

   d. Patients who have full-face motorcycle helmets must have the helmet removed in order to assess and manage the airway.

Procedure

1. Divide the students into teams of two to practice helmet removal. Each student should practice at least twice (once as rescuer 1 and once as rescuer 2).

2. Review the important points in deciding whether to remove a helmet.

3. Have the students practice padding and taping the helmet of the football player. Also have

    them practice placing padding under the head of the football player who has already had the

    helmet removed.

4. Demonstrate how to remove the face protector of a football helmet.

5. Have the students practice removing the motorcycle helmet.

Procedure for Removing a Helmet from a Patient with a Possible Cervical-Spine Injury

1. The first rescuer positions himself or herself above or behind the patient, places his or her

    hands on each side of the helmet, and manually maintains the head and neck by holding the

    helmet and the patient's neck.

2. The second rescuer positions himself or herself to the side of the patient and removes the

    chin strap. Chin straps can usually be removed easily without cutting them.

3. The second rescuer then assumes the stabilization by placing one hand under the neck at the

    occiput and the other hand on the anterior neck, with the thumb pressing on one angle of the

    mandible and the index and middle fingers pressing on the other angle of the mandible.

4. The first rescuer now removes the helmet by pulling out laterally on each side to clear the

    ears and then up to remove. Football helmets may need to have the air released and ear pads

    removed. Full-face helmets will have to be tilted back to clear the nose (tilt the helmet, not

    the head). If the patient is wearing glasses, the first rescuer should remove them through the

    visual opening before removing the full-face helmet. The second rescuer manually maintains

    the head and neck during this procedure.

5. After removal of the helmet, the first rescuer takes over SMR by grasping the head on either side with his or her fingers holding the angle of the jaw and the occiput.

6. The second rescuer now applies a suitable cervical collar.

Alternate Procedure for Removing a Helmet

This procedure has the advantage of one rescuer maintaining immobilization of the neck throughout the whole procedure. This procedure does not work well with full-face helmets.

1. The first rescuer positions himself or herself above or behind the patient and places his or her hands on each side of the neck at the base of the skull. He or she manually maintains the neck in a neutral position. If necessary, he or she may use his thumbs to perform a modified jaw thrust while doing this.

2. The second rescuer positions himself or herself over or to the side of the patient and removes the chin strap.

3. The second rescuer now removes the helmet by pulling out laterally on each side to clear the ears and then up to remove. The first rescuer maintains SMR during the procedure.

4. The second rescuer now applies a suitable cervical collar.

Procedure for Removing a Helmet from a Patient Wearing Shoulder Pads

1. Follow usual procedure for removing the helmet.

2. Place towels under head and neck to maintain neutral position.

3. Apply a head device.

Log Rolling the Supine Patient

1. Rescuer 1 maintains SMR. A rigid cervical collar is applied. Even with the collar in place, rescuer 1 maintains the head and neck in a neutral position until the log-rolling maneuver is completed.

2. The patient is placed with legs extended in the normal manner and arms (palms inward) extended by his sides. The patient will be rolled up on one arm with that arm acting as a splint as well as a spacer for the body.

3. The long backboard is positioned next to the patient. If one arm is injured, place the backboard on the injured side so that the patient will roll on the uninjured arm.

4. Rescuers 2 and 3 kneel at the patient's side opposite the board.

5. Rescuer 2 is positioned at the midchest area, and rescuer 3 is by the upper legs.

6. Rescuer 2, using his or her knees, holds the patient's near arm in place. He or she then reaches across the patient and grasps the shoulder and hips, holding the patient's far arm in place. Usually, it is possible to grasp the patient's clothing to help with the roll.

7. Rescuer 3, with one hand, reaches across the patient and grasps the hip. With the other hand, the feet are held together at the lower legs.

8. Rescuer 2, when everyone is ready, gives the order to roll the patient.

9. Rescuer 1 carefully keeps the head and neck in a neutral position (anteroposterior as well as laterally) during the roll.

10. Rescuers 2 and 3 roll the patient up on his side toward them. The patient's arms are kept

locked to his or her side to maintain a splinting effect. The head, shoulders, and pelvis are kept in line during the roll.

11. When the patient is on his side, rescuer 2 (or rescuer 4, if available) quickly examines the back for injuries.

12. The long backboard is now positioned next to the patient and held at a 30- to 45-degree angle by rescuer 4. It there are only three rescuers, the board is pulled into place by rescuer 2 or 3. The board is left flat in this case.

13. When everybody is ready, rescuer 1 gives the order to roll the patient onto the backboard. This is accomplished keeping head, shoulders, and pelvis in line.

Log Rolling the Prone (Face-Down) Patient

The status of the airway is critical for decisions concerning the order of the log-rolling procedure. There are three clinical situations that dictate how you should proceed.

1. The patient who is not breathing or who is in severe respiratory difficulty must be logrolled immediately in order to manage the airway. Unless the backboard is already positioned, you must logroll the patient, manage the airway, and then transfer the patient to the backboard (in a second log-rolling step) when ready to transport.

2. The patient with profuse bleeding of the mouth or nose must not be turned to the supine position. Profuse upper airway bleeding in a supine patient is a guarantee of aspiration. This patient will have to be carefully positioned and transported prone or on his or her side, allowing gravity to help keep the airway clear. The vacuum backboard, essentially a full-body vacuum splint, actually molds around the patient and stabilizes the head, neck, torso, and extremities,

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and therefore could be useful in this situation.

3. The patient with an adequate airway and respiration should be logrolled directly onto a back-board.

    The procedure to logroll the prone patient who has an adequate airway is as follows:

1. Rescuer 1 maintains SMR. When placing the hands on the head and neck, the rescuer's thumbs always point toward the patient's face. This prevents having the rescuer's arms crossed when the patient is rolled. A rigid cervical collar is applied.

2. The rapid trauma survey is done (including the back), and the patient is placed with legs extended in the normal manner and arms (palms inward) extended by his or her side. The patient will be rolled up on one arm, with that arm acting as a splint as well as a spacer for the body.

3. The long backboard is positioned next to the body. The backboard is placed on the side of rescuer 1's lower hand (if rescuer 1's lower hand is on the patient's right side, the backboard is placed on the patient's right side). If the arm next to the backboard is injured, carefully raise the arm above the patient's head so he or she does not roll up on the injured arm.

4. Rescuers 2 and 3 kneel at the patient's side opposite the board.

5. Rescuer 2 is positioned at the midchest area, and rescuer 3 is by the upper legs.

6. Rescuer 2 grasps the shoulder and the hip. Usually, it is possible to grasp the patient's clothing to help with the roll.

7. Rescuer 3 grasps the hip (holding the near arm in place) and the lower legs (holding them

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together).

8. Rescuer 2, when everyone is ready, gives the order to roll the patient.

9. Rescuer 1 carefully keeps the head and neck in a neutral position (anteroposterior as well as laterally) during the roll.

10. Rescuers 2 and 3 roll the patient up on his or her side away from them. The patient's arms are kept locked to his or her side to maintain a splinting effect. The head, shoulders, and pelvis are kept in line during the roll.

11. The backboard is now positioned next to the patient and held at a 30- to 45-degree angle by rescuer 4. If there are only three rescuers, the board is pulled into placed by rescuer 2 or 3. The board is left flat in this case.

12. When everyone is ready, rescuer 1 gives the order to roll the patient onto the backboard. This is accomplished keeping the head, shoulders, and pelvis in line.

Securing the Patient to the Long Backboard

There are several different methods of securing the patient using straps. Two examples of commercial devices for SMR are the Reeves sleeve and the Miller body splint.

The Reeves sleeve is a heavy-duty sleeve into which a standard backboard will slide. Attached to this sleeve are the following:

• Head motion-restriction device

- Heavy vinyl-coated nylon panels that go over the chest and abdomen and are secured with heavy nylon straps and quick-release connectors

- Two full-length leg panels to secure the lower extremities

- Straps to hold the arms in place

- Six carrying handles

- Metal rings (2500-lb strength) for lifting the patient by rope

When the patient is in the Reeves sleeve, SMR is maintained when lifted horizontally, vertically, or even carried on his or her side (like a suitcase). This device is excellent for the confused, combative patient who must be restrained for his or her own safety.

The Miller body splint is a combination backboard, head immobilizer, and body immobilizer. Like the Reeves sleeve, it does an excellent job of full-body SMR with a minimum of time and effort.

Many other innovative immobilization devices are now available. Be sure to be familiar with the ones in common use in your area.

The procedure for securing the patient to the long backboard using straps is as follows:

1. The head and neck are held in a neutral position (a rigid collar should already be in place), while padding is placed behind the head to maintain this position. A blanket roll or commercial head device is applied and strapped into position using elastic wraps or wide tape. Do not use chin straps unless they can be applied to the chin portion of the cervical collar itself. Chin straps that hold the patient's mouth closed guarantee aspiration

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if the patient vomits.

2. Two straps are laced through the top two lateral holes of the backboard. Apply them so that they connect together across the chest below the armpits and act as an anchor.

3. Bring the other ends of the straps over the shoulders and across the chest.

4. Lace the straps through the lateral holes at the level of the pelvis.

5. Bring the straps back across the lower pelvis and upper legs, and then lace them through the lateral holes and connect below the knees. The straps must be applied snugly so that the body does not move if the board has to be turned to allow the patient to vomit.

If you are not using commercial strapping that accompanies the long board, use 12-foot straps. Nine-foot straps will work, but they are usually too short to go below the knees. If you use two 9-foot straps, most adults will require another strap below the knees.

Applying and Securing a Long Backboard to a Standing Patient

Method I Immobilizing a Standing Patient with Three Rescuers

1. Apply a cervical collar while in-line stabilization is being held.

2. Position the backboard behind the patient and align it properly. Check the position of the board from the front of the patient.

3. The rescuers at the sides of the patient place their hands under each arm and grasp the next highest handhold. Their other hands grasp the elbows of the patient to provide additional stabilization on the board.

4.   Lower the patient to the ground. Communicate your intentions before lowering

          the patient so that he or she is not startled, causing the patient to move or grab the

          rescuers. Continue holding in-line stabilization until the patient is completely

          immobilized to the backboard with straps and then a head/cervical stabilization

          device.

Method II Immobilizing a Standing Patient with Two Rescuers

1.   Apply a cervical collar and position the long backboard behind the patient.

2.   The rescuers on each side of the patient hold the long board in place and hold the

          patient's head in a neutral in-line position.

3.   Each rescuer then places the leg closest to the board behind it and then lowers the

          board to the ground. Communicate your intentions before lowering the patient so

          that he or she is not startled, which could cause the patient to move or grab the

          rescuers.

4.   Once the patient is horizontal on the ground, one rescuer takes over in-line stabi-

          lization until SMR is completed

Immobilizing the Head and Neck when a Neutral Position Cannot Safely

Be Attained

If the head or neck is held in an angulated position and the patient complains of pain at any at-

tempt to realign it, you should initiate SMR in the position found. The same is true of the uncon-

scious patient whose neck is held to one side and does not easily straighten with gentle traction.

You cannot use a cervical collar or commercial head device in this situation. You must use pads

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or a blanket roll and careful taping to secure the head and neck in the position found.

SKILL STATION 5: CHEST DECOMPRESSION/FLUID RESUSCITATION

Before beginning, review "Skill Stations" (see Chapter 3). Minimum number of instructors needed: 2.

For many years needle decompression of a tension pneumothorax has been advocated as a lifesaving procedure and the anterior approach (second or third intercostal space, midclavicular line) has been most commonly used by prehospital providers. In the last few years the lateral approach has become popular with the military, who favor it because it can be used to decompress the chest without removing a soldier's body armor. Multiple studies also have been published showing that the catheters being used were too short to decompress the chest in many patients. It is recommended that for the anterior approach the catheter needle needs to be large bore (8 French or about 14 gauge) and 6 to 9 cm long. Because there are advantages and disadvantages to each decompression site, this discussion will cover both of them. Follow your state protocol or consult your service medical director for guidance about which site to use routinely.

Objectives

At the conclusion of this station, the student should be able to:

1. Describe the indications for emergency decompression of a tension pneumothorax.

2. Explain the advantages, disadvantages, and complications of needle decompression of a ten-

sion pneumothorax by the anterior approach and the lateral approach.

3. Perform needle decompression of a tension pneumothorax.

4. Perform cannulation of the external jugular vein.

5. Describe the indications, contraindications, and complications for the use of intraosseous infusion.

6. Perform intraosseous infusion.

Advanced Skill 5A: Chest Decompression

Procedure to Make a One-Way Valve for Decompression

There are several ways to make a one-way valve to attach to the decompressing catheter. The instructor may demonstrate one or all of them.

1. The best valve now available is the Asherman Chest Seal, which is available commercially and can be used to seal open chest wounds or as a one-way valve for the needle when you decompress a tension pneumothorax (see Figure 6-12 in the textbook).

2. A satisfactory valve can be made by removing the plunger from a plastic 10-cc syringe, cutting the barrel off at about the 5-cc mark, and then pulling a Penrose drain over the barrel. The device will directly attach to the plastic decompressing catheter and is an excellent one-way flutter valve to allow air to escape (see Figures 6-9, 6-12, and 6-13 in the textbook).

3. A water-seal drainage system may be made using a large-bore catheter and IV tubing. Cut off the IV tubing where it attaches to the IV bottle. Insert this end into a container of water, and place it below the level of the chest. Insert the catheter into the chest and then remove the

needle. Attach the IV tubing to the catheter. This is a sophisticated system, although not a practical one, because the container of water is likely to be turned over in a moving ambulance.

Making the Artificial Tension Pneumothorax

Commercial decompressable tension pneumothorax models have been available, but they do not work well with the anterior approach. Revised models should be available soon.

Material Needed to Make an Artificial Tension Pneumothorax

- Section of pork ribs at least 12″ by 12″

- Small trailer wheel inner tube

- Valve core remover

- Hand, foot, or electric air pump

- Two 8-fluid-ounce bottles of tire puncture sealer

- Roll of plastic wrap

- Roll of duct tape or foam latex tape

Procedure to Make the Artificial Tension Pneumothorax

1. Assemble the material.

2. Remove the valve core from the inner tube.

3. Inject the contents of two bottles of tire sealer into the inner tube, and replace the valve core.

4. Attach the air pump, and pump a small amount of air into the tube.

5. Rotate the tube so that the puncture sealer can coat the entire inner surface.

6. Fold the inner tube over on itself, and tape it together with duct tape.

7. Pump up the tube until there is a few pounds of pressure inside. Use just enough to simulate a tension pneumothorax. Excessive pressure will cause the tube to leak when the students begin decompression.

8. Wrap the ribs in plastic wrap.

9. Attach pork ribs over the central area of the tube. Tape well with duct tape or foam latex tape to simulate skin.

10. Use large-bore over-the-needle catheter to decompress the "tension pneumothorax."

11. Attach a one-way valve. You can make one from a 10-cc syringe and a Penrose drain, or use an Asherman Chest Seal.

12. Occasionally pump more air into the tube to replace the air that has been "decompressed."

Equipment List

Item	*Quantity*
Artificial tension pneumothorax	1
#14 over-the-needle catheters (Jelco)	20
IV tubing (optional)	1
Small container for water (optional)	1

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Rubber condoms (optional)	10
Paper towels (rolls)	1
10-cc syringes	2
Penrose drains	2
`Asherman Chest Seal (optional)`	1

Indications to Perform Chest Decompression

As with all advanced procedures, this technique must be accepted local protocol or you must obtain medical direction before performing it. The conservative management of tension pneumothorax is oxygen, ventilatory assistance, and rapid transport. The indication for performing emergency decompression is the presence of a tension pneumothorax with decompensation as evidenced by *more than one* of the following:

- Respiratory distress and cyanosis

- Loss of the radial pulse (late shock)

- Decreasing level of consciousness

Performing a Chest Decompression by the Lateral Approach

Advantages

The lateral chest wall is thinner than the anterior chest wall (averages 2.6 cm), so you are more likely to decompress the pneumothorax with a shorter needle and less likely to inadvertently cause hemorrhage from vascular structures.

The military and tactical medics prefer the lateral approach because in a tactical situation it has the advantage of allowing decompression while keeping body armor in place.

Disadvantages and Complications

- The decompression catheter is more likely to be dislodged when moving the patient or if the patient moves his arm. Using the Asherman Chest Seal for a one-way valve also will provide some protection against dislodgement of the decompression catheter.

- It can be difficult to reach this area when the patient is in the ambulance (especially if the tension pneumothorax is on the right).

- Laceration of the intercostal vessels may cause hemorrhage. The intercostal artery and vein run around the inferior margin of each rib (see Figure 7-1 in the textbook). Poor needle placement can lacerate one of these vessels.

- If performing the lateral approach, inserting the needle too low may lacerate the liver or spleen, and inserting the needle too high may lacerate the axillary artery, vein, or brachial plexus.

- Creation of a pneumothorax may occur if not already present. If your assessment was incorrect, you may give the patient a pneumothorax when you insert the needle into the chest.

- Laceration of the lung is possible. Poor technique or inappropriate insertion (no pneumothorax present) can cause laceration of the lung, with subsequent bleeding and an air leak.

- Risk of infection is a consideration. Adequate skin preparation with an antiseptic will usually prevent this.

Procedures

Performing a Chest Decompression by the Lateral Approach

1. Assess the patient to make sure that his condition is due to a tension pneumothorax. Signs of tension pneumothorax are

   a. Decreased level of consciousness (LOC)

   b. Open airway

   c. Rapid, shallow respiration; respiratory distress

   d. Weak/thready pulses; possible absent radial pulse

   e. Skin cool, clammy, diaphoretic; pale or cyanotic

   f. Neck vein distention (may not be present if there is associated severe hemorrhage)

   g. Possible tracheal deviation away from the side of the injury (almost never present)

   h. Absent or decreased breath sounds on the affected side

   i. Tympany (hyperresonance) to percussion on the affected side

2. Give the patient high-flow oxygen and ventilatory assistance.

3. Determine that indications for emergency decompression are present. Then, if required, obtain medical direction to perform the procedure.

4. Lateral site for decompression: Expose the side of the tension pneumothorax and identify the intersection of the nipple (fourth rib) and anterior axillary line on the same side as the pneumothorax (see Figure 7-2 in the textbook).

5 Quickly prep the area.

6. Remove the plastic cap from a 14-gauge catheter needle at least 2 inches or 5 cm long and insert the needle into the intercostal space at a 90-degree angle to the superior border of the fourth rib to avoid the neurovascular bundle (see Figure 7-3 in the textbook). If the patient is muscular or obese, you may need to use a 6– to 9-cm catheter needle. Direction of the bevel is irrelevant to successful results. As the needle enters the pleural space, there will be a "pop." If a tension pneumothorax is present, there will be a hiss of air as the pneumothorax is decompressed. If using an over-the-needle catheter, advance the catheter into the chest. Remove the needle and leave the catheter in place. *The catheter hub must be stabilized to the chest with tape.*

7. Place a one-way valve on or over the decompressing needle. The Asherman Chest Seal will go over the needle and provide a one-way valve (see Figure 7-4 in the textbook) and will protect the needle from accidently being dislodged. Other one-way valves are available or can be made but should be tested before using. (A needle through the finger of a rubber glove will not work as a one-way valve.) Young healthy patients will tolerate having no valve at all on the decompressing needle.

8. Leave the plastic catheter in position until it is replaced by a chest tube at the hospital.

9. Intubate the patient if indicated. Monitor closely for recurrence of the tension pneumothorax. If available, monitor with capnography. An increase in the CO_2 is an early sign the catheter is kinked or the tension pneumothorax is worsening. (A 13- or 14-gauge catheter may not be large enough to decompress a large air leak.)

Performing a Chest Decompression by the Anterior Approach

Advantages

- The anterior site is preferred by many because, in the supine patient, air in the pleural space tends to accumulate anteriorly. Thus, there is a better chance of having the air in the pleural space removed when decompressing at the midclavicular area.

- Monitoring of the site is easier if performed in the anterior site because the catheter is not as likely to be unintentionally dislodged when the patient is moved or if the patient moves his arm.

Disadvantages and Complications

- Unless a needle of proper length is used, it is likely that the needle will not reach the pleural space, and the tension pneumothorax will not be decompressed. The recommended catheter length is 6 to 9 cm (2.5 to 3.5 inches) (see Figure 7-5 in the textbook).

- If the insertion of the needle is medial to the midclavicular line (nipple line), there is danger of cardiac puncture or great vessel laceration.

- Laceration of the intercostal vessels may cause hemorrhage. The intercostal artery and vein run around the inferior margin of each rib. Poor needle placement can lacerate one of these vessels.

- Creation of a pneumothorax may occur if not already present. If your assessment was incorrect, you may give the patient a pneumothorax when you insert the needle into the chest.

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- Laceration of the lung is possible. Poor technique or inappropriate insertion (no pneumothorax present) can cause laceration of the lung, with subsequent bleeding and an air leak.

- Risk of infection is a consideration. Adequate skin preparation with an antiseptic will usually prevent this.

Decompression by the Anterior Approach

1. Assess the patient to make sure that his condition is due to a tension pneumothorax. Signs of tension pneumothorax are

    a. Decreased level of consciousness (LOC)

    b. Open airway

    c. Rapid shallow respiration; respiratory distress

    d. Weak/thready pulses; possible absent radial pulse

    e. Skin cool, clammy, diaphoretic; pale or cyanotic

    f. Neck vein distention (may not be present if there is associated severe hemorrhage)

    g. Possible tracheal deviation away from the side of the injury (almost never present)

    h. Absent or decreased breath sounds on the affected side

    i. Tympany (hyperresonance) to percussion on the affected side

2. Give the patient high-flow oxygen and ventilatory assistance.

3. Determine that indications for emergency decompression are present. Then, if required, obtain medical direction to perform the procedure.

4. Anterior site for decompression: Expose the side of the tension pneumothorax and identify the second or third intercostal space on the anterior chest at the midclavicular line on the

same side as the pneumothorax. This may be done by feeling for "angle of Louis," the bump located on the sternum about a quarter of the way from the suprasternal notch (see Figure 7-6 in the textbook). The insertion site should be slightly lateral to the midclavicular line (nipple line) to avoid cardiac or major vascular complications in the mediastinum.

5. Quickly prepare the area with an antiseptic.

6. Remove the plastic cap from a 14-gauge or larger catheter 6 to 9 cm long (8 French, 9-cm Turkel Safety Needle; 14-gauge, 8.25-cm ARS decompression needle; 8.5 French, 6-cm Cook pneumothorax needle; or 14-gauge, 8-cm angiocath), and insert the needle into the intercostal space at a 90-degree angle to the superior border of the third rib to avoid the neurovascular bundle (see Figure 7-7 in the textbook). Direction of the bevel of the needle is irrelevant to successful results. Be very careful not to angle the needle toward the mediastinum. As the needle enters the pleural space, there will be a "pop." If a tension pneumothorax is present, there will be a hiss of air as the pneumothorax is decompressed. If using an over-the-needle catheter, advance the catheter into the chest (see Figure 7-8 in the textbook). Remove the needle and leave the catheter in place. The catheter hub must be stabilized to the chest with tape.

7. Place a one-way valve on or over the decompressing needle. The Asherman Chest Seal will go over the needle to provide a one-way valve and to protect the needle from accidental dislodgment. Other one-way valves are available or can be made but should be tested before using. (A needle through the finger of a rubber glove will not work as a one-way valve.) Young healthy patients will tolerate having no valve at all on the decompressing needle.

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8.   Leave the plastic catheter in position until it is replaced by a chest tube at the hospital.

9.   Intubate the patient if indicated. Monitor closely for recurrence of the tension pneumotho-

      rax.

Advanced Skill 5B: Cannulation of the External Jugular Vein

Equipment List

Item	*Quantity*
Live model	1
Marking pencils (red and blue)	1 each

Important Points

1. Stress the importance of learning to use large-bore needles. In the same period of time, a 14-
   gauge cannula will infuse twice as much fluid as a 16-gauge cannula, and three times as
   much as an 18-gauge cannula. A 20-gauge cannula infuses so little fluid that it is useful only
   for pediatric patients or for keep-open lines.

2. Because you are only simulating starting the IV line, you do not actually have to use a needle
   to demonstrate the technique. Your model will be more comfortable if you use something
   blunt.

Indication

The pediatric or adult patient who needs IV access and in whom no suitable peripheral vein is

found.

Surface Anatomy

The external jugular vein runs in a line from the angle of the jaw to the junction of the medial and middle third of the clavicle. This vein is usually easily visible through the skin and can be made more prominent by pressing on it just above the clavicle. It runs into the subclavian vein.

Procedure

1. The patient must be in the supine position, preferably head down, to distend the vein and prevent air embolism.

2. If no suspicion of cervical-spine injury exists, turn the patient's head to the opposite side. If there is a danger of a cervical-spine injury, one rescuer must stabilize the head (it must not be turned) while the IV is being started. The cervical collar should be opened or the front removed during the procedure.

3. Quickly prepare the skin with an antiseptic and then align the cannula with the vein. The needle will be pointing at the clavicle at about the junction of the middle and medial thirds.

4. With one finger, press on the vein just above the clavicle. This should make the vein more prominent.

5. Insert the needle into the vein at about the midportion and cannulate in the usual way.

6. If not already done, draw a 30-cc sample of blood and store it in the appropriate tubes (if the hospital will accept blood drawn in the field).

7. Tape down the line securely. If there is danger of a cervical-spine injury, a cervical collar can be applied over the IV site.

Advanced Skill 5C: Intraosseous Infusion

Equipment List

Item	Quantity
Artificial infant leg for IO insertion	2
Betadine solution	4 fluid ounces/10 cc
Syringes	1 per student*
16- to 18-gauge intraosseous needles	1 per student*
Nonsterile rubber gloves	1 box
Paper towels	1 roll

One per student means number of students in the skill station at each teaching session (not the entire class).

Important Points

1. Stress that intraosseous (IO) infusion is rarely used as a first-line procedure for intravenous access. When it is used in an EMS system, protocols should be employed directing criteria for it to be used.

2. Children 6 years of age and younger are the target population for successful implementation of intraosseous infusion.

3. If you are not going to use one of the commercial pediatric intraosseous legs, the anatomical sites of insertion should be demonstrated using one of the students as a model before practic-

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ing on animal bones.

4. Stress that an intraosseous line is never placed in a fractured extremity.

5. As with all advanced procedures, this technique must be accepted local protocol, and permission from medical direction (protocol or verbal) must be obtained before performing.

6. If infiltration occurs (rare), do not reuse the same bone. Another site must be selected, as fluid will leak out of the original hole made in the bone.

7. Potential complications:

    a. Subperiosteal infusion due to improper placement

    b. Osteomyelitis

    c. Sepsis

    d. Fat embolism

    e. Marrow damage

    f. Tibial fracture if needle is too large

    Studies have proven all of these complications to be rare; however, good aseptic technique is important, just as with intravenous therapy.

Discussion

The technique of bone marrow infusion of fluid and drugs is not new. Intraosseous infusion (IO) was first described in 1922 and was used commonly in the 1930s and 1940s as an alternative to intravenous infusion of crystalloids, drugs, and blood. The technique was "rediscovered" in the

1980s; and studies have confirmed it to be a fast, safe, and effective route to infuse medications, fluids, and blood. Intraosseous infusion can be used for giving medications in both adults and children. It is now an early second-line choice for venous vascular access following two attempts at peripheral venous cannulation in adults as well. With pressures of 300 mm Hg applied to the infusion bag or pump, adequate flow rates of 150 mL/minute can be achieved for crystalloids. IO infusion has the advantage of being quick and simple to perform while providing a stable (anchored in bone) access that is not easily dislodged during transport.

Indications

- A pediatric or adult patient who is in cardiac arrest and in whom you cannot quickly obtain peripheral venous access

- Hypovolemic pediatric patients who have a prolonged transport and in whom you cannot quickly obtain peripheral venous access

- Any patient who needs drugs or fluids within 5 minutes, when a peripheral intravenous cannula cannot be placed in two attempts or 90 seconds

Contraindications

- Local infection at selected site for insertion

- Fractures in the selected limb

- Prosthesis

- Recent (24 hours) IO access in same extremity

- Absence of anatomical landmarks or excessive tissue at site of insertion

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Recommended Sites

- Proximal tibia, one finger breadth medial to the tibial tuberosity

- Proximal humerus, laterally over prominence of the greater tubercle

- Distal tibia, two finger breadths above the medial malleolus

Potential Complications

Studies have shown that the following complications are rare. However, good aseptic technique is important, just as it is with IV therapy. Potential complications of IO infusion include the following:

- Extravasation

- Compartment syndrome

- Dislodgment

- Fracture

- Failure (device or user in origin)

- Pain

- Infection; adult infection rates < 0.6% (retrospective analysis)

PROCEDURE

Performing IO by Use of EZ-IO Device (Adult or Child)

The equipment needed to perform IO by use of EZ-IO device is as follows:

- EZ-IO® driver

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- EZ-IO AD® or EZ-IO PD® needle set

- Alcohol or Betadine swab

- EZ-Connect® or standard extension set

- Two 10-mL syringes

- Normal saline (or suitable sterile fluid)

- Pressure bag or infusion pump

- 2% Lidocaine for IV/IO use (preservative free, epinephrine free)

Procedure

Insertion of IO Needle by Use of the EZ-IO System

Determine the need for this procedure. Obtain permission from medical direction if required. If the patient is conscious, advise him of emergent need for this procedure and obtain informed consent.

 To perform the insertion (see Scan 9-1 in the textbook):

1. Wear approved body substance isolation (BSI) equipment.

2. Determine EZ-IO AD or EZ-IO PD indications.

3. Rule out contraindications.

4. Locate appropriate insertion site.

5. Prepare insertion site, using aseptic technique, and then allow to dry.

6. Prepare the EZ-IO driver (power or manual) and appropriate needle set.

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a. EZ-IO 15 mm for 3 to 39 kg

b. EZ-IO 25 mm for 40 kg and greater

c. EZ-IO 45 mm for 40 kg and greater with excessive tissue

7. Stabilize site to insert appropriate needle set.

8. Remove needle cap. Insert the EZ-IO needle into the selected site. (Keep your hand and fingers away from the needle.) Position the driver at the insertion site with the needle set at a 90-degree angle to the bone surface.

9. Gently pierce the skin with the needle until the needle touches the bone. The black line on the needle should be visible. Penetrate the bone cortex by squeezing driver's trigger and applying gentle, consistent, steady downward pressure. (Allow the driver to do the work.) *Do not use excessive force.* In some patients insertion may take 10 seconds. If the driver sounds like it is slowing down during insertion, reduce pressure on the driver to allow the RPMs of the needle tip to do the work. If the battery fails, you may manually finish inserting the needle just as you would a manual IO needle.

10. Release the driver's trigger and stop the insertion process when a sudden "give or pop" is felt on entry into the medullary space or when desired depth is obtained.

11. Remove EZ-IO driver from the needle set while stabilizing the catheter hub.

12. Remove the stylet from the catheter by turning counterclockwise. Place the stylet in the shuttle or approved sharps container.

13.   Confirm placement. Connect the primed EZ-Connect. Syringe bolus (flush) the EZ-IO

catheter with the appropriate amount of normal saline (10 cc for adults and 5 cc for children).

Remember: no flush = no flow!

14. If the patient is responsive to pain or complains of pain when you flush the marrow cavity,

slowly (0.2-cc increments) administer the appropriate dose of preservative-free (for IV/IO use)

Lidocaine 2% (20 mg/cc) IO to anesthetize the IO space. (IO infusion causes severe pain in alert

patients.)

   a.   2 to 4 cc (20 to 40 mg) for adults

   b.   0.5 mg/kg (0.025 mL per kg)for children

Then wait 15 to 30 seconds for the Lidocaine to take effect.

15. Begin the infusion. Utilize pressure—300 mm Hg (pressure bag or infusion pump)—for con-

      tinuous infusions.

16. Dress the site, secure the tubing, and apply the wristband (document time and date) as di-

      rected.

17.   Monitor the EZ-IO site and the patient's condition.

To remove the catheter, start by supporting the patient's leg. Simultaneously, connect a sterile

Luer-Lok syringe to the hub of the catheter. Once connected, rotate the syringe and catheter

clockwise while gently pulling. When the catheter has been removed, immediately place it in an

appropriate biohazard container. *Do not leave the EX-IO catheter in place for more than 24*

hours.

Performing Manual IO Infusion in a Child

1.   Determine the need for this procedure. Obtain permission from medical direction if required.

2.   Have all needed equipment ready prior to bone penetration.

   a.   16- to 18-gauge IO needles

   b.   5-cc and 10-cc syringes

   c.   Antiseptic solution to prep the skin

   d.   IV tubing and IV fluids

   e.   Tape and dressing material to secure the IO needle

   f.   Blood pressure cuff or commercial pressure device to infuse fluid under pressure

3.   Identify the site, which is the proximal tibia, one finger breadth below the tibial tuberosity, either midline or slightly medial to the midline (see Figure 9-2 in the textbook).

4.   Prep the skin with an appropriate antiseptic (very important).

5.   Obtain the proper needle. The needle must have a stylet so that it does not become plugged with bone. Although 13-, 18-, and 20-gauge spine needles will work, they are difficult and uncomfortable to grip during the insertion process. Long spine needles tend to bend easily, so if you use spine needles, try to obtain the short ones. The preferred needle is a 14- to 18-gauge IO needle, but bone marrow needles also can be used.

6.   Using aseptic technique, insert the needle into the bone marrow cavity perpendicular to the skin, directed away from the epiphyseal plate (see Figure 9-2 in the textbook). Advance it to the periosteum. Penetrate the bone with a slow boring or twisting motion until you feel a

sudden "give or pop" (decrease in resistance) as the needle enters the marrow cavity. This can be confirmed by removing the stylet and aspirating blood and bone marrow (see Figures 9-3 and 9-4 in the textbook).

7. Syringe bolus (flush) the IO catheter with 5 cc of normal saline. Remember: no flush = no flow!

8. If the child is responsive to pain or complains of pain when you flush, slowly (0.2-cc incre-ments) administer a 0.5 mg/kg (0.025 mL per kg) dose of preservative-free (for IV/IO use) Lidocaine 2% (20 mg/cc) IO to anesthetize the IO space. A 10-kg child would get 0.25 cc (5 mg of 2% Lidocaine). Wait 15 to 30 seconds for the Lidocaine to take effect. Assess for po-tential IO complications.

9. Attach standard IV tubing and infuse the fluid and/or medications (see Figure 9-5 in the text-book). You may have to infuse fluid under pressure (blood pressure cuff blown up around IV bag) to obtain an adequate infusion rate.

10. Tape the tubing to the skin and secure the bone marrow needles as if to secure an impaled object. (Use gauze pads taped around the insertion site.)

SKILL STATION 6: PATIENT ASSESSMENT AND MANAGEMENT

Before beginning, review "Skill Stations" (see Chapter 3). Minimum instructors needed: 1.

Objective

At the conclusion of this station, the student should be able to demonstrate the proper sequence of assessment and management of a trauma patient.

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Important Points

1. The time allowed (30 minutes) is very short. You must begin immediately.

2. Each group of students will rotate through patient assessment and management twice. Those going through the station the first time should watch you do a demonstration of the ITLS Primary Survey, ITLS Ongoing Exam and ITLS Secondary Survey. You should also review the ground rules that will be in effect for the patient assessment scenarios the second day. If time permits, have the students practice patient assessment. Those who rotated through the other patient assessment station first should spend the whole period practicing patient assessment. Thus, half of the groups will watch you demonstrate assessment and go over ground rules, and the other half will spend the period practicing assessment.

3. Every student should be given a grade sheet for study purposes.

4. Students not actually participating in the assessment should follow along with the grade sheet.

5. At the end of the scenario, point out that, although this case was a little tricky, it is an example of an actual case in which the patient died because the history of the stab wound was not obtained.

Equipment List

You will have two stations, so double the amounts below.

| *Item* | *Quantity* |

Live model	1
Moulage kit or red felt-tip pen	1
Rigid cervical collar	1
Monitor-defibrillator (optional)	1
Trauma box	1
BP cuff	1
Stethoscope	1
Kerlix rolls	1
4″ elastic wraps	4
4 × 4 gauze pads (unsterile)	20
Wide tape (rolls)	1
IV tubing	2
Oxygen mask or nasal prongs	1
Long backboard with straps	1
Cushion-type head immobilizer	1
Asherman Chest Seal, defibrillation pads,	
or plastic wrap	1
Grade sheets	1 per student

Procedure

When you are demonstrating assessment, choose two students to assist you to perform initial assessment, rapid trauma survey, Secondary Survey, and Ongoing Exam. Use the trauma scenario. Explain and demonstrate exactly how you want them to do the exams.

When you are having the students practice patient assessment, select three students to be the rescue team. Have them evaluate the patient who is described in the trauma scenario. Any extra students should follow using the grade sheet. If possible, try to go through the scenario twice so that all the students can participate. If two instructors are present, one instructor should interact with the student during the scenario while the other instructor follows along with the grade sheet (just as you will do in the practice and testing scenarios). The student team leader should be given the completed grade sheet to use for study.

Trauma Scenario

A young male was driving through an intersection. His automobile hit another vehicle. He was not wearing restraints, and the vehicle did not have an air bag.

History

    S—pain in left chest and upper back

    A—no allergies

    M—takes no medications

    P—no significant illness

    L—last meal eaten 2 hours ago (hot dogs and lima beans)

E—"I was stabbed by my girlfriend's husband. I was trying to get to the hospital when the

accident occurred."

Injuries

1. Fracture of C-7, but no spinal cord injury yet

2. Stab wound to anterior chest, with development of pericardial tamponade

Patient Instructions

You are initially awake and alert. If asked, you complain of pain in the left chest and upper back.

If your neck is not stabilized or if your neck is allowed to move, immediately become paralyzed.

Moulage Instructions

Make contusions over sternum and forehead. Make a small puncture wound on the anterior left

chest.

Patient Evaluation: lnstructor's Information (Memorize)

Scene size-up

No dangers; obvious mechanism of injury is a deceleration automobile accident (windshield

cracked, steering wheel bent). The other mechanism is a stab wound of the chest (this must

be obtained by history). The driver was the only occupant of his vehicle; the other vehicle

had no injured occupants.

Initial assessment

General impression—patient appears in no distress

LOC—patient is alert and responds appropriately

Airway—clear

Breathing—rate normal, quality normal

Ventilation instructions—none, may order oxygen

Circulation

    Pulses—present and strong at the wrist; rate appears normal

    Bleeding—none obvious

    Skin color and condition—warm, dry, pink

Decision—rapid trauma survey due to mechanism

Rapid trauma survey

    Head and face—bruising on forehead, otherwise normal

    Neck—tender at base of neck, no other signs of trauma

        Trachea—midline

        Neck veins—flat

    Chest

        Looking—contusion from steering wheel, small puncture wound to left chest

        Feeling—tender over sternum, no instability, no crepitation

Listening—breath sounds present and equal, heart sounds normal

Abdomen—no DCAP-BTLS

Pelvis—no DCAP-BTLS, no instability or crepitation

Legs—no DCAP-BTLS, no instability or crepitation

Exam of posterior—no signs of trauma

Decision—load and go due to puncture wound of chest

History (obtained by team leader)—must be given by the patient

Vital signs (may be obtained by team member)

    BP—110/70

    Pulse—90 (slightly irregular)

    Respiration—20

Decision—Seal puncture wound of chest; give oxygen; start two large-bore IVs, but run at

      KVO rate

Ongoing exam

  Neurological

    LOC—patient confused and agitated

    Pupils—slightly dilated, but react equally

    Sensory—unchanged

    Motor—unchanged

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GCS—(14) eyes (4), verbal (4), motor (6)

Airway—clear

Breathing—rate 26, quality normal

Circulation

Blood pressure—70/50

Pulses—not present at the wrist, present but weak at neck; rate rapid at 160

Skin color, condition, and temperature—cool, clammy, pale

Neck—no swelling or discoloration

Trachea—midline

Neck veins—distended

Chest

Looking—contusion from steering wheel, small puncture wound to left chest

Feeling—no instability, no crepitation

Listening—breaths sounds present and equal, heart sounds decreased from previous exams

Abdomen—soft, not distended, no response to palpation

Focused assessment of injuries

No bleeding from the stab wound

No change in bruise on sternum

Secondary survey

History and vital signs—unchanged from above

Neurological

LOC—alert and oriented

Pupils—equal and reactive

Sensory—abnormal "tingling" sensation below the neck

Motor—normal

Head—scalp normal, contusion and tenderness of the forehead, no lacerations or deformity,

face—no DCAP-BTLS, no instability or crepitation, no Battle's sign or raccoon eyes, no

blood or fluid from ears or nose

Airway—open and clear

Breathing—unchanged from above

Neck—tender to palpation

Trachea—midline

Neck veins—slightly distended

Circulation— BP unchanged; skin still warm and dry

Chest—unchanged from above

Listening—heart sounds normal

Abdomen—no tenderness, not distended

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Pelvis—do not examine again

Extremities

> **Upper**—no injuries noted, good pulses and motor function, sensation—some "tingling" feeling

> **Lower**—no injuries noted, good pulses and motor function, sensation—some "tingling" feeling

Decision—continue present treatment

Interventions

Transport immediately if not already en route

Check to see that 100% oxygen is being given

Begin two IVs if not already done—cautious fluid challenge during transport

Report to medical direction

Cardiac monitor—sinus tachycardia

Pulse oximeter—98% saturation

Repeat vital signs after IV fluids:

> **BP**—90/60

> **Pulse**—130

> **Respiration**—24

Now responds to verbal stimuli

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Other ITLS Courses

ITLS eTrauma.

ITLS eTrauma sets the standard with online education that's interactive, flexible, accessible, and affordable for all. ITLS eTrauma covers the eight hours of ITLS Provider classroom instruction in a self-paced format that fits the non-stop lifestyle of trauma care providers. The interactive reinterpretation of the ITLS Provider course lectures in an online format utilize video clips, quiz questions, click-and-drag matching exercises, new case students, and more to maximize learning and retention.

ITLS eTrauma provides 8 hours CECBEMS credit to EMS personnel.

ITLS eTrauma has been developed as the newest tool in the ITLS trauma training tool box. This multifaceted solution can be utilized in two different ways:

> **1. For continuing education only:** The program is self-paced and flexible to meet the time constraints of students who juggle multiple commitments. Students looking for continuing education hours in trauma specifically or in emergency care in general can work through the 13 lessons as quickly or as slowly as their schedule permits.

2. For ITLS Provider certification: Students who wish to become ITLS Provider certified can use ITLS eTrauma as the didactic part of a flexible alternative to the traditional 2-day in-person ITLS Provider course as a method for earning ITLS certification.

ITLS Completer Course.

After the student completes ITLS eTrauma, they continue their ITLS education with a Completer Course to earn ITLS Basic or Advanced Provider certification. The Completer Course is an in-person course that features 8 hours of hands-on skills station demonstration, practice, and testing, plus the Written Exam required for Provider certification. The Student earns their ITLS Provider certification and card at the completion of this course, as well as 8 additional hours of CEC-BEMS credit.

ITLS Completer Courses are run through ITLS chapters or held in conjunction with a national or international EMS event. The Completer Course provides a setting in which to learn, practice, and demonstrate proficiency of the necessary skills that comprise the practical assessment of the ITLS Provider course, thus earning ITLS Basic or Advanced certification.

Pediatric ITLS

Pediatric ITLS continues the training of the Provider courses, reflecting the same ITLS method of assessment and management but with an emphasis on the special needs of the pediatric patient. The eight-hour course teaches the principles of proper assessment, management, critical interventions, patient packaging, and rapid transport for pediatric trauma patients. It also highlights proven techniques for communicating with young patients and their parents. This course

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focuses on the practical training needed to make responders feel confident and competent when faced with caring for the critically injured child.

Hands-on stations include:

- Patient assessment and management

- Airway management and thoracic trauma

- Fluid resuscitation

- Spinal motion restriction and extrication — with an emphasis on pediatric immobilization devices

The 3rd edition of the ITLS Pediatric course manual, Pediatric Trauma Life Support for Prehospital Care Providers, was published in 2009 to reflect the most current and effective approaches to the care of the pediatric trauma patient. The course provides 8 hours of continuing education credit.

ITLS Access.

ITLS Access gives EMS crews and first responders the training they need to reach, stabilize and extricate trapped patients. A focus on patient care sets ITLS Access apart from other extrication courses. The eight-hour course is built around the concept of using hand tools instead of hydraulics, utilizing items commonly carried on an ambulance or first responder unit, or found on scene. The updated course includes techniques for hybrid vehicles, trucks, buses, and small aircraft in addition to its primary focus on traditional vehicles.

Focus on safety and stabilization and the program's intensive hands-on format for learning and practicing real-world skills. Applicable to anyone who has a duty to respond to the scene of a motor vehicle collision.

The course provides 8 hours of continuing education credit.

REFRESHER COURSE FOR INSTRUCTORS

Trauma care changes over time; therefore, the ITLS courses must change to reflect new standards of care. ITLS requires that all instructors are updated to the latest edition of the ITLS student manual by completing an Instructor Update (or Refresher Course.) The format of the Instructor Update is determined by the ITLS Editorial Board. Additional requirements for updating instructors may be set by the ITLS chapter..

RECERTIFICATION COURSE FOR PROVIDERS

Trauma care is changing rapidly, and all professionals experience some degree of skills decay. It is reasonable that every few years ITLS providers should recertify their trauma assessment and management skills. Most ITLS provider cards are issued for a three year period. By the end of that period, the provider must successfully complete a refresher course or an initial course to receive a new ITLS card. The following is a tentative agenda for a one-day refresher course. Students should reread the book (or read the new edition), take a pretest, and then study the areas of weakness as identified on the pretest. Students should be prepared to take a written test during the recertification course. They should spend the morning reviewing skills and the afternoon reviewing patient assessment.

Example of a Recertification Course for Providers Agenda

Registration and collection of pretests	30 min
Written test	60 min
Skill stations	30 min each
Lunch	60 min
Review of patient assessment	15 min
Patient assessment scenario practice and testing	120 min
Faculty meeting	30 min

AFFILIATE FACULTY TRAINING PROGRAM

Instructors who are chosen to be affiliate faculty members should have a brief training session to prepare them for this role. This could be scheduled on the evening before a course in which they are to teach.

Example of an Affiliate Faculty Training Program Agenda

Registration	30 min
Welcome and course overview	5 min
ITLS: A global perspective	15 min
Chapter ITLS: A local perspective	15 min
Overview of chapter policies and procedures	15 min

Roles and responsibilities of the chapter affiliate faculty	15 min
Common perils and pitfalls encountered in a "typical" ITLS class	30 min
Review of the ITLS grading system	5 min
Questions and answers	
Summary	10 min

ITLS Instructor Bridge Course

An Advanced Trauma Life Support (ATLS) or a Prehosptial Trauma Life Support (PHTLS) instructor may become an ITLS instructor following successful completion of a chapter-approved bridging course, which emphasizes ITLS patient assessment, administrative structure, and philosophy of ITLS. This course is open to any currently certified PHTLS or ATLS instructor who wishes to become an ITLS instructor. An ITLS faculty member must conduct the course.

Rationale—This course has been developed to facilitate the process by which certified trauma instructors may become certified as ITLS instructors. The course assumes that the candidate is familiar with basic instructional methodology and the skills of ITLS. Successful completion certifies the candidate as an ITLS instructor candidate.

Necessary Prerequisites—The prerequisite for registering in the Bridge Course is current PHTLS or ATLS (or similar trauma training program) Instructor Certification.

Certified By—Following completion of the Bridge Course, the candidate is classified as an "in-structor candidate." In order to become certified as an ITLS instructor, the candidate must be recommended for certification by a faculty member who monitors the candidate teaching during an ITLS Provider Course. Monitoring must be within 12 months of the bridge course and include teaching a lecture and a skill station. An extension may be granted on the 12 months if considered appropriate by the chapter medical director.

Certified For—Three years.

Recertification—In order to be recertified as an ITLS instructor, the individual must teach and be monitored in at least one ITLS course (Basic or Advanced) per year for the 3 years of certification. Instructor updates may be required as deemed necessary by the chapter.

Recommended Course Length—One day.

Required Text—ITLS Instructor Manual and ITLS Provider Manual.

ITLS Instructor Bridge Course Agenda

    Registration and collection of pretests   30 min

Written test	60 min
Administrative structure	45 min

- ITLS structure and philosophy

- Chapter structure and philosophy

- Chapter policy and procedures

- Roles of a chapter ITLS instructor

- Chapter precourse and postcourse material

Break	15 min
Skill stations	30 min

- Preskill setup

- Skill lesson presentation

- Assistant instructors

Instructor candidate demonstrations	90 min

- Basic and Advanced Airway Management

- Short SMR Devices/Emergency Rescue and Rapid Extrication

- Traction Splints

- Helmet Management/Log Roll/Long Backboard

- Chest Decompression/Fluid Resuscitation

Lunch	60 min

Course objectives, lesson plans, and curriculum	30 min

- Advanced ITLS course lesson plan

- Basic ITLS course lesson plan

- Combined ITLS course lesson plan

- Teaching stations

- Testing stations

ITLS patient assessment	30 min
Patient assessment demonstration	15 min
Instructor candidate demonstrations: patient assessment teaching and testing	90 min
Faculty meeting	

ITLS Provider Bridge Course.

ITLS offers a "bridge" courses for experienced providers of other trauma courses who wish to transition to ITLS. The experienced provider may become an ITLS provider following successful completion of a chapter-approved bridging course, which emphasizes ITLS patient assessment, and the other skills that are included in ITLS.

ITLS Provider Bridge Course Agenda

08:00 – 08:30   —   Welcome and Collection and Review of Pretest

08:30 – 09:15   —   Patient Assessment Lecture

09:15 – 09:45   —   Airway Lecture

09:45 – 10:15   —   Head Trauma Lecture

10:15 – 10:30   —   Break

10:30 – 11:00   —   Shock Lecture

11:00 – 11:20   —   Skill Station

11:20 – 11:40   —   Skill Station

11:40 – 12:00   —   Skill Station

12:00 – 12:20   —   Skill Station

12:20 – 13:05   —   Lunch

13:05 - 13:40   —   Written Test

13:40 -   —   Patient Assessment Test (time allocated depends on number of students
and instructors)

Skill Stations:

1. Airway
2. Chest Decompression, Fluid Management, IO
3. Patient Assessment I
4. Patient Assessment II

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Policies and Procedures

Policy and procedure manuals for each chapter are available through that chapter's ITLS office.

THE ITLS ORGANIZATION:

INTERNATIONAL TRAUMA LIFE SUPPORT

ITLS is a global organization dedicated to preventing death and disability from trauma through education and emergency trauma care. ITLS is a U.S. not-for-profit organization incorporated in Alabama with offices in Illinois. It is a tax-exempt organization under Section 501 (c) (3) of the IRS code. ITLS is supported by student fees, book sales, and royalties from sales of books and other educational materials.

As stated in its articles of incorporation, the purpose of the organization is to provide trauma training for EMS personnel. However, the proper disposition of the program—including the analysis of methods of education of the adult learner, assessment of the state of the art in trauma care, performance of research in trauma care and patient assessment, efficient management of the organization, provision of venues for organizational meetings, and support of the organization's committees—clearly deals with issues within the purview of ITLS.

ITLS is a continually developing organization. As long as the program is provided as a method of behavior modification relative to patient assessment and management for the EMS provider, ITLS will continue to exist.

ITLS, as a nonprofit corporation, is governed by its Board of Directors. Chapter delegates at the organization's annual meeting elect the members of the board of directors. The board members have rotating terms of 3 years. Each chapter is allocated a number of delegates to the annual meeting, which is determined by the number of students trained in that chapter during the previous 2-year period. To qualify as a chapter's delegate, a person must be an ITLS provider, instructor, chapter coordinator, chapter medical director or person engaged in an administrative capacity for that chapter.

ITLS also designates training centres which are authorized to conduct certified ITLS courses. In most cases, ITLS training centres are proprietary organizations which do not qualify for chapter designation. ITLS training centres typically train their own personnel and clients in ITLS. They do not participate in the governance process of ITLS.

Because it is driven by the input from its chapters and training centres, ITLS is sensitive and responsive to its stakeholders.

ITLS has a management services contract with the Illinois College of Emergency Physicians (ICEP) for staffing. Its Executive Director is Ginny Kennedy Palys, JD, MSW, who is an ICEP employee. The ITLS Board of Directors annually evaluates the management services provided to the organization.

International Trauma Conference

Each year the ITLS International Trauma Conference is held to provide educational sessions on trauma and EMS education, and networking with ITLS instructors and providers around the world. The annual business meeting of the organization is held during the International Trauma

Conference. Representatives from each chapter attend, as well as persons interested in becoming

ITLS providers and instructors or those who are working with new ITLS chapters and training

centers. The ITLS International Trauma Conference has been held annually since January 1985.

ITLS Organizational Chart

ITLS Board of Directors

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International Meeting Delegates

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Chapter Advisory Committee

↓

Chapter Medical Director

↓

Chapter Coordinator

↓

Chapter Affiliate Faculty

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Course Medical Director

Course Coordinators

Instructors

↓

Providers

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ITLS CHAPTER STRUCTURE

The educational and business mechanisms of the management of ITLS within a given chapter are based on two broad groups: the faculty and providers, and the administrative leaders and course managers. These groups are defined by the following levels.

Faculty and Providers

Affiliate Faculty

Basic ITLS Instructor

Advanced ITLS Instructor

Pediatric ITLS Instructor

ITLS Access Instructor

Basic ITLS Provider

Advanced ITLS Provider

Pediatric ITLS Provider

ITLS Access Provider

Administrative Leaders of the Chapter Program

Advisory Committee Member

Advisory Committee Chairperson

International Meeting Delegate

Chapter Medical Director

Chapter Coordinator

International Faculty

Course Managers Within the Chapter Program

Course Medical Director

Course Coordinator

Affiliate Faculty

ITLS CHAPTER RESPONSIBILITIES

The following is a list of some of the ongoing responsibilities of ITLS chapters. This list is not

all-inclusive and may include other chapter-specific responsibilities.

- Coordinate local ITLS courses.

- Collect data, including the number of providers and various faculty members.

- Disseminate information from the ITLS office to the constituents of the chapter.

- Provide information to the ITLS office on ITLS advisory committee activities and new con-

  cepts developed within the chapter.

- Provide quality assurance for ITLS courses that are conducted within the chapter.

- Provide local financial management for ITLS chapter programs.

- Market ITLS programs within the chapter.

- Appoint delegates to represent the chapter at the ITLS International Congress.

- Provide course reports and remit course fees on a quarterly basis to ITLS.

ITLS RESPONSIBILITIES TO THE CHAPTERS

The following is a list of ongoing activities and services that ITLS provides its chapters. This list is not intended to be all-inclusive.

- Disseminate current information to chapters regarding changes in protocols, changes in ITLS teaching materials, and updates on revisions to ITLS policies and procedures.

- Provide resources to new chapters and organizational materials to assist them in developing ITLS programs.

- Provide a clearinghouse for ITLS committee recommendations to the chapters.

- Provide quality assurance at an international level by enforcing the guidelines and standards recommended by the ITLS Board of Directors and committees.

- Conduct the annual meeting and trauma conference for constituents from all chapters to be represented.

- Prepare financial reports.

- Provide vehicles to communicate with ITLS chapters, providers, instructors, and persons interested in the organization.

- Distribute ITLS educational materials and specialty items.

- Establish methods for rapid distribution of ITLS cards and certificates to persons successfully completing ITLS courses.

ITLS CERTIFICATIONS

Basic ITLS Provider

Prerequisites—The candidate must be an entry-level EMS provider such as a first responder, basic emergency medical technician, or other allied health professional who holds suitable qualifications for entry.

Requirements for Certification—The candidate must attend all the lectures and skills stations, and obtain a written test score of at least 74% and at least "adequate" on the patient assessment test. The local chapter may require a higher score.

Length of Certification—ITLS recommends a 3-year certification period. An ITLS chapter may change the period to 2 or 4 years, depending on local need.

Recertification—The provider must attend an approved basic ITLS recertification course prior to the expiration date on the card or complete a certified ITLS provider course. The local chapter may decide which is appropriate.

Advanced ITLS Provider

Prerequisites—The candidate must be an advanced-level practitioner such as a certified/licensed EMT–Intermediate, paramedic, registered nurse, physician assistant, physician, or other allied health professional. *(The definition of an advanced-level practitioner is one who can perform advanced airway procedures, perform IV cannulation, and administer IV fluids. Advanced airway management is defined as the use of a blind insertion airway device, or endotracheal tube.)*

Requirements for Certification—The candidate must attend all the lectures and skill stations, and obtain a written test score of at least 74% and at least "adequate" on the patient assessment test. The local chapter may require a higher score.

Length of Certification—ITLS recommends a 3-year certification period. An ITLS chapter may change the period to 2 or 4 years, depending on local need.

Recertification—The provider must attend an approved advanced ITLS recertification course prior to the expiration date on the card or complete a certified ITLS provider course. The local chapter may decide which is appropriate.

Pediatric ITLS Provider

Prerequisites—It is strongly suggested that the candidate be a certified basic or advanced ITLS or PHTLS provider.

Requirements for Certification—The candidate must attend all the lectures and skill stations, and obtain a written test score of at least 74% and at least "adequate" on the patient assessment test. The local chapter may require a higher score.

Length of Certification—ITLS recommends a 3-year certification period. An ITLS chapter may change the period to 2 or 4 years, depending on local need.

Recertification—The provider must attend an approved pediatric ITLS recertification course prior to the expiration date on the card or complete a certified pediatric ITLS provider course. The local chapter may decide which is appropriate.

ITLS Access Provider

Prerequisites—The candidate must be in EMS, police or fire service in at least a first responder role.

Requirements for Course Completion—The candidate must attend all the lectures and skill stations. The local chapter may increase these requirements.

Length of Recognition—ITLS recommends a 3-year certification period. An ITLS chapter may change the period to 2 or 4 years, depending on local need.

Rerecognition—The provider must attend an approved ITLS access provider update course.

Basic ITLS Instructor

Prerequisites—Achieve at least 86% on the written test, achieve "excellent" on the patient assessment test, and be recommended as a potential instructor by the course medical director or an affiliate faculty during an ITLS provider course. The instructor candidate must be successfully monitored teaching a lecture, skill station, and testing station prior to being awarded instructor

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status. The ITLS advisory chapter committee may increase these prerequisites.

Physicians who are board certified in emergency medicine, are ATLS providers, or actively participate and teach trauma care may take the instructor course or preceptorship without taking the full provider course.

In unusual circumstances a physician or other EMS provider (EMT, nurse, nurse practitioner, or physician's assistant) who has not taken the instructor course may serve as a course anssistant. However, this may be done only with the permission of the chapter ITLS medical director or committee. These requirements are necessary to maintain the high quality of certified courses.

Requirements for Certification—The candidate must successfully complete an ITLS instructor course and be monitored (in lecture, skills stations, and patient assessment in a provider course) by a course medical director or an affiliate faculty.

Length of Certification—ITLS recommends a 3-year certification period. An ITLS chapter may change the period to 2 or 4 years, depending on local need.

Recertification—Basic ITLS instructors may maintain their instructor certification by teaching at least one ITLS course (instructor or provider) per year for the years of certification and attending instructor updates or refresher courses as deemed necessary by the chapter advisory committee. The chapter advisory committee may develop additional criteria.

Removal Procedure—The chapter shall establish a mechanism, through the chapter advisory committee, to revoke the certification of a basic ITLS instructor should the need arise. In addition, the chapter shall establish a method to provide the instructor with due process in the event that the instructor certification is revoked.

EXAMPLE: If written allegations are made regarding inappropriate conduct by or an inadequate knowledge base of an instructor, the chapter advisory committee may initiate an investigation. The instructor's certification status may also be suspended pending the outcome of the investigation. The chairperson of the chapter advisory committee shall appoint a three-member special committee to conduct the investigation. The investigation shall be completed within 60 days. Upon completion, the instructor will be informed, in writing, of the basis of the allegations and given an opportunity to refute the allegations, in writing, within 30 days.

The special committee will then make recommendations to the chapter advisory committee for action including, but not limited to, one or more of the following:

a. Temporary suspension of instructor certification for a specified period of time

b. Permanent suspension of instructor certification

c. Remedial training

d. Supervision by an affiliate faculty for a specified period of time

Advanced ITLS Instructor

Prerequisites—Achieve at least 86% on the written test, achieve "excellent" on patient assessment test, and be recommended as a potential instructor by the course medical director or an affiliate faculty during an ITLS provider course. The instructor candidate must be successfully monitored teaching a lecture, skill station, and testing station prior to being awarded instructor status. The ITLS advisory chapter committee may increase these prerequisites.

Physicians who are board certified in emergency medicine, are ATLS providers, or actively

participate and teach trauma care may take the instructor course or preceptorship without taking the full provider course.

In unusual circumstances a physician or other EMS provider (EMT, nurse, nurse practitioner, or physician's assistant) who has not taken the instructor course may serve as a course anssistant. However, this may be done only with the permission of the chapter ITLS medical director or committee. These requirements are necessary to maintain the high quality of certified courses.

Requirements for Certification—The candidate must successfully complete an ITLS instructor course or preceptorship and monitoring (in lecture, skills stations, and patient assessment in a provider course) by a course medical director or an affiliate faculty.

Length of Certification—ITLS recommends a 3-year certification period. An ITLS chapter may change the period to 2 or 4 years, depending on local need.

Recertification Advanced ITLS instructors may maintain their instructor certification by teaching at least one ITLS course (instructor or provider) per year for the years of certification and attending instructor updates or refresher courses as deemed necessary by the chapter advisory committee. The chapter advisory committee may develop additional criteria.

Removal Procedure—The chapter shall establish a mechanism, through the chapter advisory committee, to revoke the certification of an advanced ITLS instructor should the need arise. In addition, the chapter shall establish a method to provide the instructor with due process in the event that the instructor certification is revoked.

EXAMPLE: If written allegations are made regarding inappropriate conduct by or an inadequate knowledge base of an instructor, the chapter advisory committee may initiate an investigation. The instructor's certification status may also be suspended pending the outcome of the investigation. The chairperson of the chapter advisory committee shall appoint a three-member special committee to conduct the investigation. The investigation shall be completed within 60 days. Upon completion, the instructor will be informed, in writing, of the basis of the allegations and given an opportunity to refute the allegations, in writing, within 30 days.

The special committee will then make recommendations to the chapter advisory committee for action including, but not limited to, one or more of the following:

a. Temporary suspension of instructor certification for a specified period of time

b. Permanent suspension of instructor certification

c. Remedial training

d. Supervision by an affiliate faculty for a specified period of time

Pediatric ITLS Instructor

Note: Basic instructors cannot teach advanced skills or assessment in the Pediatric ITLS course.

Prerequisites—To qualify as a pediatric ITLS instructor, a person must achieve instructor potential on the provider course, complete the ITLS instructor course, and be monitored teaching. Persons who are experienced instructors of other EMS courses are eligible to take the Instructor Bridge course in lieu of the full instructor course.

ITLS pediatric instructors must be updated on the 3rd edition Pediatric ITLS course material prior to teaching.

Requirements for Certification—The candidate must successfully complete an ITLS instructor course or preceptorship and monitoring (in lecture, skills stations, and patient assessment in a provider course) by an affiliate faculty. Previous basic or advanced ITLS instructors are not required to take an instructor course or preceptorship and require only monitoring.

Length of Certification—ITLS recommends a 3-year certification period. An ITLS chapter may change the period to 2 or 4 years, depending on local need.

Recertification—Pediatric ITLS instructors may maintain their instructor certification by teaching at least one pediatric ITLS course per year for the years of certification and attending instructor updates or refresher courses as deemed necessary by the chapter advisory committee. The chapter advisory committee may develop additional criteria.

Removal Procedure—The chapter shall establish a mechanism, through the chapter advisory committee, to revoke the certification of a pediatric ITLS instructor should the need arise. In addition, the chapter shall establish a method to provide the instructor with due process in the event that the instructor certification is revoked.

> **EXAMPLE:** If written allegations are made regarding inappropriate conduct by or an inadequate knowledge base of an instructor, the chapter advisory committee may initiate an investigation. The instructor's certification status may also be suspended pending the outcome of the investigation. The chairperson of the chapter advisory committee shall appoint a three-

member special committee to conduct the investigation. The investigation shall be completed within 60 days. Upon completion, the instructor will be informed, in writing, of the basis of the allegations and given an opportunity to refute the allegations, in writing, within 30 days.

The special committee will then make recommendations to the chapter advisory committee for action including, but not limited to, one or more of the following:

a. Temporary suspension of instructor certification for a specified period of time

b. Permanent suspension of instructor certification

c. Remedial training

d. Supervision by an affiliate faculty for a specified period of time

ITLS Access Instructor

Prerequisites—Recognized and certified training and experience as an adult educator. Recognized and certified training and experience as a vehicle rescue provider or instructor.

Requirements for Certification—The candidate must be recommended as a potential instructor by an affiliate faculty during an ITLS access course. Becoming an ITLS access instructor is similar to an apprenticeship program. There is no formal course, as the content is separate from the usual ITLS core material. The chapter advisory committee may modify these requirements.

Length of Certification—ITLS recommends a 3-year certification period. An ITLS chapter may change the period to 2 or 4 years, depending on local need.

Recertification—The instructor must teach at least one ITLS access provider course per year for

the years of certification. Instructor updates and refresher courses may be required as deemed necessary by the advisory committee.

Removal Procedure—The chapter shall establish a mechanism, through the chapter advisory committee, to revoke the certification of an ITLS access instructor should the need arise. In addition, the chapter shall establish a method to provide the instructor with due process in the event that the instructor certification is revoked.

> **EXAMPLE:** If written allegations are made regarding inappropriate conduct by or an inadequate knowledge base of an instructor, the chapter advisory committee may initiate an investigation. The instructor's certification status may also be suspended pending the outcome of the investigation. The chairperson of the chapter advisory committee shall appoint a three-member special committee to conduct the investigation. The investigation shall be completed within 60 days. Upon completion, the instructor will be informed, in writing, of the basis of the allegations and given an opportunity to refute the allegations, in writing, within 30 days.
>
> The special committee will then make recommendations to the chapter advisory committee for action including, but not limited to, one or more of the following:
>
> a. Temporary suspension of instructor certification for a specified period of time
>
> b. Permanent suspension of instructor certification
>
> c. Remedial training
>
> d. Supervision by an affiliate faculty for a specified period of time

ITLS APPOINTMENTS

Chapter Advisory Committee Member

Duties and Responsibilities—Advise the chapter medical director and chapter coordinator on matters concerning the Chapter ITLS Program on issues such as the following:

- Development of chapter policy and procedures

- Promulgation of ITLS throughout the chapter area

- Development of long-range and strategic plans

- Dissemination of information at the local level

- Disciplinary issues

Other Duties

- Provide input into the process of becoming a chapter.

- Provide mechanism through which personnel throughout the area have a voice in ITLS-related matters.

- In conjunction with the chapter medical director and chapter coordinator, make recommendations for appointment of affiliate faculty.

- Oversee the due process of revocation for ITLS instructors, affiliate faculty, course coordinators, and course medical directors.

- Execute other duties as assigned by the chapter.

Appointed By—The organization holding the chapter charter. Each chapter may designate its appointment process.

Length of Appointment—Three years or whatever length is deemed appropriate by the chapter.

Prerequisites—Set by the organization holding the charter.

> **EXAMPLE:** Affiliate faculty with extensive knowledge and experience in ITLS and the management of educational programs.

Appointment Procedure—The advisory committee is established by the organization holding the charter. It may accomplish this by requesting the appointee's commitment to the development of ITLS in the chapter area. A broad base of providers representing all geographical areas should be selected for the committee. Representatives should be basic and advanced EMS providers and other allied health professionals. The chapter developers should invite representation from area emergency medical organizations to participate.

Vacancy Procedure—Set by the organization holding the charter.

> **EXAMPLE**: A curriculum vitae (résumé), recommendations by two current affiliate faculty, and a letter stating intent should be sent to the chapter advisory committee. The advisory committee shall select the most suited for the position from the pool of applicants.

Reappointment Procedure—Set by the organization holding the charter.

> **EXAMPLE**: The performance of the advisory committee members will be subject to review to determine the advisability of reappointment. The review will be completed by the entity or organization that appointed the member with recommendation by the chapter medical direc-

tor. The review will be held on a schedule consistent with the length of term of the committee. It is suggested that one-third of members be reviewed annually.

Removal Procedure—The chapter shall establish a mechanism, through the entity or organization that appointed the chapter advisory committee, to remove the designation of a chapter advisory committee member should the need arise. In addition, the chapter shall establish a method to provide the chapter advisory committee member with due process in the event that the designation is revoked.

> **EXAMPLE:** If written allegations are made regarding inappropriate conduct by or an inadequate knowledge base of the chapter advisory committee member, the entity or organization that appointed the chapter advisory committee may initiate an investigation. The chapter advisory committee member designation may also be suspended pending the outcome of the investigation. The entity or organization that appointed the chapter advisory committee member shall appoint a three-member special committee to conduct the investigation. The investigation shall be completed within 60 days. Upon completion, the chapter advisory committee member will be informed, in writing, of the basis of the allegations and given an opportunity to refute the allegations, in writing, within 30 days.
>
> The special committee will then make recommendations for action including, but not limited to, one or more of the following:
>
> a. Temporary suspension of the chapter advisory committee member designation for a specified period of time
>
> b. Permanent suspension of chapter advisory committee member designation

c. Remedial training

d. Supervision by the chapter advisory committee and/or chapter coordinator

Advisory Committee Chairperson

Duties and Responsibilities

- Lead and supervise the ITLS committee.

- Serve as the liaison between the ITLS advisory committee and the charter holder.

- Advise the organization holding the charter on issues relative to the operation of the ITLS program and the progress of the committee.

- Oversee the operation of the ITLS advisory committee.

- Appoint ad hoc subcommittees as needed to address specific ITLS issues.

- Provide leadership for the ITLS advisory committee for strategic and long-range planning.

- Appoint a special committee to execute due process in the event of revocation.

- Execute other duties as assigned by the chapter.

Prerequisites

- Must be a member of the advisory committee.

- The nominee should have extensive experience in managing continuing education courses and demonstrate an in-depth knowledge of ITLS.

- Experience as a committee chairperson is preferred.

Appointed By—The organization holding the charter in consultation with the Chapter.

Length of Appointment—One to three yearsI as deemed appropriate by the chapter.

Appointment Procedure—Set by the organization holding the charter.

> **EXAMPLE:** The ITLS advisory committee chairperson will be appointed by the ITLS charter holder from the body of the ITLS advisory committee.

Reappointment Procedure—Set by the organization holding the charter.

> **EXAMPLE:** The performance of the committee chairperson should be reviewed on an annual basis by the medical director, peer review, and/or the charter holder's board of directors to determine the advocacy of reappointment. Should the chairperson not demonstrate satisfactory performance or not wish to continue, the charter holder's board of directors shall ask for his or her resignation and initiate a search for qualified candidates.

Removal Procedure—The chapter shall establish a mechanism, through the entity or organization that appointed the chapter advisory committee chairperson, to remove the designation of a chapter advisory committee chairperson should the need arise. In addition, the chapter shall establish a method to provide the chapter advisory committee chairperson with due process in the event that the designation is revoked.

> **EXAMPLE:** If written allegations are made regarding inappropriate conduct by or an inadequate knowledge base of the chapter advisory committee chairperson, the entity or organization that appointed the chapter advisory committee may initiate an investigation. The chapter

advisory committee chairperson designation may also be suspended pending the outcome of the investigation. The entity or organization that appointed the chapter advisory committee chairperson shall appoint a three-member special committee to conduct the investigation. The investigation shall be completed within 60 days. Upon completion, the chapter advisory committee chairperson will be informed, in writing, of the basis of the allegations and given an opportunity to refute the allegations, in writing, within 30 days.

The special committee will then make recommendations for action including, but not limited to, one or more of the following:

a. Temporary suspension of the chapter advisory committee chairperson designation for a specified period of time

b. Permanent suspension of chapter advisory committee chairperson designation

c. Remedial training

d. Supervision by the chapter advisory committee and/or chapter coordinator

International Faculty

Each year ITLS conducts the International Trauma Conference at which educational sessions are held and the business of the organization is conducted. Each chapter is allocated a number of delegates (or "international faculty") to represent the chapter at the conference. The number of votes a chapter is awarded is determined by the number of ITLS students trained during the prior 2 years. Under the bylaws, students are counted based on course records and payments received by the international office by March 31 of the following year. The selection and appointment of

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delegates ("international faculty") is the responsibility of the chapter.

Delegates must be affiliated with the chapter as an ITLS provider, instructor, chapter coordinator, chapter coordinator, or person performing an administrative role for that chapter.

Duties and Responsibilities

- Represent the ITLS chapter as an international meeting delegate.

- Engage in dialogue regarding the direction of the organization.

- Participate in the election process by attending all sessions and voting for qualified candidates.

- Communicate the perspective of the chapter with regard to major issues.

- Disseminate information to all members of the advisory committee as required.

- Communicate the proceedings of the meeting with the chapter in the manner prescribed by the chapter.

Prerequisites

- Must be an ITLS provider, instructor, chapter medical director, chapter coordinator, or person engaged in an administrative role for the chapter

- Should have a strong working knowledge of ITLS and related issues

- Orientation by the chapter medical director and/or the advisory committee to the position

Appointed By—ITLS advisory committee and/or the chapter medical director.

Length of Appointment—Duration of the annual international meeting or whatever length is

deemed appropriate by the chapter.

Chapter Medical Director

Duties and Responsibilities

- Responsible for the management of the ITLS program within the chapter, in both educational and business-related matters.

- Provide consistent leadership for the program.

- Stimulate the evolution and consistency of ITLS programs throughout the chapter area.

- Ensure the availability of training and the quality of the programs offered.

- Ensure the medical appropriateness of the course content.

- Ensure that the program is taught in a manner consistent with the EMS laws of the chapter.

- Ensure the medical quality of ITLS courses throughout the chapter.

- Advise the ITLS chapter advisory committee on the appointments of affiliate faculty.

- Represent ITLS as an international meeting delegate, if possible.

- Regularly review the courses held under the auspices of the appointed course directors within the chapter.

- Relieve a course director of this title if he or she fails to present courses that are consistent with ITLS standards, or where management of the course impedes student education or the reputation of the chapter ITLS program.

- Relieve a course coordinator of this title if he or she fails to present courses that are con-

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sistent with ITLS standards, or where management of the course impedes student education

or the reputation of the chapter ITLS program.

- In association with the chapter coordinator, facilitate the daily operation of the ITLS pro-

   gram.

- Oversee the appeal of due process activities.

- Execute other duties as assigned by the chapter.

Prerequisites

- Must be a physician licensed to practice medicine within the chapter area plus other criteria

   developed by the chapter

   EXAMPLES:

   - Should be a physician involved in emergency medicine with a background of involve-

      ment in prehospital care

   - Should be an ITLS instructor

Appointed By—ITLS advisory committee and/or the sponsoring organization holding the char-

ter.

Length of Appointment—Two years or whatever length is deemed appropriate by the chapter.

The performance of the director should be reviewed on an annual basis to determine the advoca-

cy of reappointment.

Removal Procedure—The chapter shall establish a mechanism, through the entity or organiza-

tion that appointed the chapter medical director, to remove the designation of a chapter medical director should the need arise. In addition, the chapter shall establish a method to provide the chapter medical director with due process in the event that the designation is revoked.

> **EXAMPLE:** If written allegations are made regarding inappropriate conduct by or an inadequate knowledge base of the chapter medical director, the chapter advisory committee may initiate an investigation. The chapter medical director's designation may also be suspended pending the outcome of the investigation. The entity or organization that appointed the chapter medical director shall appoint a three-member special committee to conduct the investigation. The investigation shall be completed within 60 days. Upon completion, the chapter medical director will be informed, in writing, of the basis of the allegations and given an opportunity to refute the allegations, in writing, within 30 days.
>
> The special committee will then make recommendations for action including, but not limited to, one or more of the following:
>
> a. Temporary suspension of the chapter medical director designation for a specified period of time
>
> b. Permanent suspension of chapter medical director designation
>
> c. Remedial training
>
> d. Supervision by the chapter advisory committee and/or chapter coordinator

Chapter Coordinator

Duties and Responsibilities

- In association with chapter medical director, facilitate the daily operation of the ITLS program.

- Provide consistent leadership for the program.

- Stimulate the evolution and consistency of ITLS programs throughout the chapter area.

- Ensure the availability of training and the quality of the programs offered.

- Provide financial management and oversight of the ITLS chapter, including organization of chapter finances.

- Ensure the quality and consistency of ITLS, focusing primarily on the administrative aspects.

- Advise the chapter advisory committee regarding the appointment of affiliate faculty.

- Represent ITLS as an international meeting delegate if appointed

- Demonstrate proficiency with the ITLS course management systems (CMS)

- Provide administrative support for the ITLS chapter.

- Execute the plans and enforce the policies of the ITLS Policy and Procedure Manual.

- Coordinate due process activities of the chapter advisory committee.

- Execute other duties as assigned by the chapter.

Prerequisites

- Must possess and maintain affiliate faculty status or be the administrative designate of the ITLS chapter

- Should be an individual who has experience in managing continuing education courses and

has demonstrated an in-depth knowledge of prehospital and hospital trauma care

•   Fulfill other criteria as determined by the chapter

Appointed By—ITLS advisory committee and/or the sponsoring organization holding the charter.

>   **EXAMPLE:** The chapter coordinator is elected by the ITLS advisory committee and serves a 2-year term or whatever is deemed appropriate by the chapter. The performance of the coordinator should be reviewed on an annual basis to determine the advocacy of reappointment. Should the coordinator not demonstrate satisfactory performance or not wish to continue, the ITLS advisory committee shall initiate a search for a qualified candidate.

Length of Appointment—Two years or whatever length is deemed appropriate by the chapter.

Removal Procedure—The chapter shall establish a mechanism, through the entity or organization that appointed the chapter coordinator, to remove the designation of a chapter coordinator should the need arise. In addition, the chapter shall establish a method to provide the chapter coordinator with due process in the event that the designation is revoked.

>   **EXAMPLE:** If written allegations are made regarding inappropriate conduct by or an inadequate knowledge base of the chapter coordinator, the chapter advisory committee may initiate an investigation. The chapter coordinator designation may also be suspended pending the outcome of the investigation. The entity or organization that appointed the chapter coordinator shall appoint a three-member special committee to conduct the investigation. The investigation shall be completed within 60 days. Upon completion, the chapter coordinator will be informed, in writing, of the basis of the allegations and given an opportunity to refute the al-

legations, in writing, within 30 days.

The special committee will then make recommendations for action including, but not limited to, one or more of the following:

    a. Temporary suspension of the chapter coordinator designation for a specified period of time

    b. Permanent suspension of chapter coordinator designation

    c. Remedial training

    d. Supervision by the chapter medical director and/or chapter advisory committee

Affiliate Faculty

Duties and Responsibilities

- Monitor the quality of ITLS courses in the chapter.

- Serve as a resource person for course medical directors and course coordinators.

- Monitor new ITLS instructors.

- Participate as faculty for instructor courses and updates.

- Participate as faculty for provider courses.

- Participate in the ITLS advisory committee structure.

    EXAMPLES:

- Serve as primary liaison between ITLS instructors and the ITLS advisory committee.

- Disseminate information to providers and instructors.

- Promote ITLS.

- Provide valuable input affecting decisions made at the chapter level.

- Execute other duties as assigned by the chapter.

Prerequisites

- Must keep ITLS instructor certification current

- Should complete a chapter ITLS advisory committee approved affiliate faculty training program

- Must possess considerable knowledge with respect to the ITLS chapter structure and operations

- Must be willing to maintain active involvement with the development of ITLS educational material

- Must possess a willingness to promote actively the growth and development of the ITLS program

- Fulfill other criteria as assigned by the chapter

Appointed By—ITLS advisory committee and/or chapter medical director. Affiliate faculty should be equally distributed throughout the chapter.

EXAMPLE OF APPOINTMENT PROCEDURE: A curriculum vitae (résumé), recommendations by two current affiliate faculty, and a letter stating intent should be sent to the chapter advisory committee. The advisory committee shall vote on the appropriateness of the

appointment.

EXAMPLE OF REAPPOINTMENT PROCEDURE: Reappointment of affiliate faculty
should be determined by their yearly activities, which should include participation in at least
two ITLS courses per year and/or on the needs and demands of the chapter. Reappointment is
not considered an automatic right or due.

Length of Appointment—Twelve months or whatever length is deemed appropriate by the
chapter.

Removal Procedure—The chapter shall establish a mechanism, through the chapter advisory
committee, to revoke the affiliate faculty designation of an ITLS (basic, advanced, or pediatric)
instructor should the need arise. In addition, the chapter shall establish a method to provide the
affiliate faculty member with due process in the event that the designation is revoked.

EXAMPLE: If written allegations are made regarding inappropriate conduct by or an inade-
quate knowledge base of the affiliate faculty member, the chapter advisory committee may
initiate an investigation. The affiliate faculty member's designation may also be suspended
pending the outcome of the investigation. The chairperson of the chapter advisory committee
shall appoint a three-member special committee to conduct the investigation. The investiga-
tion shall be completed within 60 days. Upon completion, the affiliate faculty member will
be informed, in writing, of the basis of the allegations and given an opportunity to refute the
allegations, in writing, within 30 days.

The special committee will then make recommendations to the chapter advisory commit-
tee for action including, but not limited to, one or more of the following:

a. Temporary suspension of the affiliate faculty designation for a specified period of time

b. Permanent suspension of affiliate faculty designation

c. Remedial training

d. Supervision by the chapter medical director and/or chapter coordinator

Course Medical Director

To be certified, an ITLS course must be taught by registered ITLS instructors under the sponsorship of ITLS International. The course does not certify future performance nor does it confer license of any kind on successful completion.

ITLS strongly recommends on-site involvement of physician instructors in ITLS courses to integrate materials into the local emergency medical service systems, as well as to provide medical oversight.

Each course must have a medical director who is available for consultation during the course. The course medical director acknowledges accountability by being familiar with all course content and ensuring the course is taught per guidelines of the chapter's policy and procedures and ITLS International.

When the course medical director is not on-site, each course must have a designated affiliate faculty provide the necessary quality assurance, overall responsibility, and assure adherence to ITLS standards.

Duties and Responsibilities

- Provide clinical oversight during the course.

- Act as a resource to the affiliate faculty member(s) present.

- Promote professional relationship with EMS providers during the course.

- In the absence of an instructor, be prepared to present information.

- Chair faculty meetings.

Prerequisites

- The course medical director must be a licensed physician within the chapter.

- Should be familiar with EMS systems and prehospital care and have experience and training related to trauma patients.

- Should be an ITLS instructor or should serve as codirector for one course with a physician ITLS instructor.

Approved By—Chapter medical director.

Length of Appointment—The time frame of the scheduled ITLS course.

Removal Procedure—The chapter shall establish a mechanism, through the chapter advisory committee, to remove the designation of a course medical director should the need arise. In addition, the chapter shall establish a method to provide the course medical director with due process in the event that the designation is revoked.

> **EXAMPLE:** If written allegations are made regarding inappropriate conduct by or an inadequate knowledge base of the course medical director, the chapter advisory committee may initiate an investigation. The course medical director's designation may also be suspended pending the outcome of the investigation. The chairperson of the chapter advisory committee shall appoint a three-member special committee to conduct the investigation. The investigation shall be completed within 60 days. Upon completion, the course medical director will be informed, in writing, of the basis of the allegations and given an opportunity to refute the allegations, in writing, within 30 days.
>
> The special committee will then make recommendations to the chapter advisory committee for action including, but not limited to, one or more of the following:
>
> a. Temporary suspension of the course medical director designation for a specified period of time
>
> b. Permanent suspension of course medical director designation
>
> c. Remedial training
>
> d. Supervision by the chapter medical director and/or chapter coordinator

Course Coordinator

Duties and Responsibilities

- Must be present throughout the course and will serve as the primary resource for information and questions of an administrative nature.

- Coordinate all aspects of the ITLS course:

  - Proper precourse preparation

  - Ordering of course manuals

  - Ordering and distribution of ITLS educational resources to students and lecturers

  - Arranging for equipment

  - On-site coordination, including meals and breaks

  - Entering course, student and faculty data into the ITLS course management system (CMS)

  - Appropriate placement of equipment in working order

  - Flow of skills stations

  - Patient assessment practice and testing stations

  - Grading of written exams

  - Submission of the appropriate paperwork and fees to the chapter office within required time frame

- Must work closely with the course medical director, affiliate faculty, and ITLS chapter office.

- Execute other duties as assigned by the chapter.

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Prerequisites

- ITLS certification preferred, but not required.

- Experienced EMS educator and program organizer with thorough knowledge of the ITLS program. A demonstrated history of coordinating and conducting multiple session programs (e.g., ACLS, PALS, etc.) is helpful.

- Able to coordinate all requirements precourse, during the course, and postcourse follow-up.

- These prerequisites may be modified by the chapter.

Appointed By—Chapter coordinator.

Length of Appointment—Determined by the chapter charter holder

Removal Procedure—The chapter shall establish a mechanism, through the chapter advisory committee, to remove the designation of a course coordinator should the need arise. In addition, the chapter shall establish a method to provide the course coordinator with due process in the event that the designation is revoked.

> **EXAMPLE:** If written allegations are made regarding inappropriate conduct by or an inadequate knowledge base of the course coordinator, the chapter advisory committee may initiate an investigation. The course coordinator's designation may also be suspended pending the outcome of the investigation. The chairperson of the chapter advisory committee shall appoint a three-member special committee to conduct the investigation. The investigation shall be completed within 60 days. Upon completion, the course coordinator will be informed, in writing, of the basis of the allegations and given an opportunity to refute the allegations, in

writing, within 30 days.

The special committee will then make recommendations to the chapter advisory committee for action including, but not limited to, one or more of the following:

a. Temporary suspension of the course coordinator designation for a specified period of time

b. Permanent suspension of course coordinator designation

c. Remedial training

d. Supervision by the chapter medical director and/or chapter coordinator

ITLS Instructor Reciprocity with Chapters

ITLS instructor certification will be accepted from any other ITLS chapter. An instructor coming into a different ITLS chapter must apply to the ITLS chapter coordinator for reciprocity. This application will include the instructor's past activities regarding ITLS teaching and a letter confirming good standing from his or her former chapter medical director.

Once approved by the ITLS chapter coordinator, a chapter affiliate faculty must monitor the instructor while teaching. On completion of monitoring, the affiliate faculty will send his or her recommendation to the ITLS chapter coordinator. The chapter coordinator may issue a certification card or, in the case of an unfavorable recommendation, present the results to the chapter advisory committee.

ITLS Provider Reciprocity with Chapters

ITLS providers from other ITLS chapters will be accepted to the date of expiration of their certification card. The provider must attend an ITLS course within the chapter to recertify. The chapter may modify this requirement.

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Campbell/Coordinator and Instructor Guide for *International Trauma Life Support, 7/e*

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Student Guide and Optional Skills

STUDENT GUIDE TO ITLS

ITLS Mission Statement

ITLS is a global organization dedicated to preventing death and disability from trauma through education and emergency trauma care.

What to Wear at the Course

ITLS is a practical course that stresses hands-on teaching. You should wear comfortable clothes that you do not mind getting dirty. Blue jeans and sweatshirts are perfect.

How to Prepare for the Course

You absolutely must read and study the ITLS book before the course. There is not enough time in 2 days to learn the written material, master the skills, and imprint the ITLS patient assessment method. The philosophy of a 2-day hands-on course is to be familiar with the material beforehand, to review the concepts briefly, and then to spend most of the time practicing the practical applications of those concepts. The best method of preparation is to do the following:

1. Read the book through once (including skill stations that are to be taught in your course—you should be notified if you are to be responsible for any of the optional skills). Unless noti-

fied in writing, you are not required to read, nor will you be tested on, material in the Student

section of the online Resource Central.

2. Take the pretest.

3. Reread the book, paying particular attention to those subjects identified as weaknesses by the

   pretest.

4. Memorize the ITLS Primary Survey, ITLS Ongoing Exam and ITLS Secondary Survey.

5. If possible, practice patient assessment using the team approach as outlined in Chapter 3.

Grades

If you are taking a certified course, you will have to take a written exam and a practical test. The

practical test is patient assessment. You will not be required to test on each of the skills taught in

the skill stations. However, you will be required to use those skills correctly in the management

of your simulated patients. The written test is composed of 50 questions and requires a grade of

at least 74% to pass. Patient assessment is a practical exam, and you are graded on your overall

management of the problem. Students demonstrating superior performance may be invited to be-

come instructor candidates.

Schedule

You will be sent a schedule for the course. ITLS is a very intensive learning course, and time

must be used efficiently. You must be familiar with your skill station schedule so that you have

time to practice each skill during the brief time available.

How to Function as a Team

1. Decide who will be the team leader, rescuer 2, and rescuer 3. Change each time you practice so that each member gets to be team leader once.

2. Before entering the room, be sure each of you understands your duties.

Team Leader. You are responsible for the overall performance of the team. You must direct other team members to do certain actions if they do not do them on their own. You must perform the scene size-up, see that the spine is stabilized, and perform the patient assessment. You are the only member who should interact directly with the instructor. The other team members report to you, and you are responsible for their actions. You should help carry some of the equipment to the patient.

Rescuer 2. While the team leader is sizing up the scene, you should get the cervical collar, trauma box, and oxygen equipment and carry it to the patient. Do not approach the patient until the team leader states that it is safe to do so. When you approach the patient, you will place the equipment within easy reach and immediately stabilize the patient's cervical spine (unless the team leader elects to do this). You must maintain stabilization of the neck with either your hands or your knees until the patient is transferred to a backboard and the head immobilizer is applied. You are also in charge of maintaining the airway and appropriate ventilation. The team leader should give you ventilation instructions as soon as the airway has been examined. If the team leader forgets to give you instructions, you may ask, "Are there any ventilation instructions?"

Rescuer 3. While the team leader is surveying the scene, you should get the backboard and head immobilizer and be ready to place them next to the patient. You should assist with helmet re-

moval, stop bleeding, dress wounds, and proceed with other tasks as delegated. You should help transfer the patient to the backboard and secure the straps. Team members do *not* have to stand around waiting to be told to do something, but they must *not* take over the evaluation of the patient. The team leader may elect to stabilize the neck but is still responsible for assessing the patient and assuring that all procedures are performed. This is accomplished more easily if rescuer 2 is allowed to maintain stabilization.

Review Ground Rules for Teaching and Evaluation and the Patient Assessment Pearls in Chapter 3 of the ITLS student textbook.

OPTIONAL SKILL STATIONS

OPTIONAL SKILL 1: DIGITAL INTUBATION

Minimum instructors needed: 1

Objectives

Upon completion of this skill station, the student should be able to:

1. Discuss the indications for digital intubation.

2. Perform digital intubation.

The original method of endotracheal intubation, widely known in the 18th century, was the tactile or digital technique. The intubator merely felt the epiglottis with the fingers and slipped the endotracheal tube distally through the glottic opening. Recently the technique has been re-

fined and demonstrated to be of use in the prehospital setting for a wide variety of patients.

Indications

Tactile orotracheal intubation is particularly useful for deeply comatose or cardiac arrest patients who

- Are difficult to position properly for direct laryngoscopic visualization

- Are somewhat inaccessible to the full view of the rescuer

- May be at risk of cervical-spine injury

- Have facial injuries that distort anatomy

- Have copious oropharyngeal bleeding or secretions that impair visualization of the airway

    You may prefer to perform tactile intubation when you are more confident in your ability with this technique, or when a laryngoscope fails or is not immediately available. The technique is most valuable in those patients in difficult positions (e.g., extrications) and in those who have copious secretions despite adequate attempts at suctioning.

Equipment

 This method of intubation requires the following:

- Endotracheal tube, 7.0-, 7.5-, or 8.0-mm internal diameter

- Malleable stylet (*Note:* some prefer to perform the procedure without a stylet.)

- Water-soluble lubricant (use silicone spray for mannequin)

- 12-cc syringe

- A dental prod, mouth gag, or something similar for placing between the teeth

- Rubber examining gloves

- Adult intubation mannequin

Procedure

1. Perform routine preparation procedures as taught in Chapter 5 of the student manual.

2. The tube is prepared by inserting the lubricated stylet and bending the tube into an open "J" configuration. The stylet should not protrude beyond the tip of the tube, but it should come to at least the side hole.

3. A water-soluble lubricant is used liberally on the tip and cuff of the tube.

4. Wear gloves for protection.

5. The intubator kneels at the patient's left shoulder facing the patient, and places a dental prod or mouth gag between the patient's molars.

6. The intubator then "walks" the index and middle fingers of his left hand down the midline of the tongue, all the while pulling forward on the tongue and jaw. *This is an important maneuver and serves to lift the epiglottis up within reach of the probing fingers.*

7. The middle finger palpates the epiglottis. It feels much like the tragus of the ear.

8. The epiglottis is pressed forward and the tube is slipped into the mouth at the left labial angle anterior to the palpating fingers. The index finger is used to keep the tube tip against the side of the middle finger (that is still palpating the epiglottis). This guides the tip to the epiglottis.

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The side hole of the tube can also be used as a landmark to ensure that the intubator is always aware of the position of the tip of the endotracheal tube. *This is a crucial principle of this technique.*

9. Guide the tube tip to lie against the epiglottis using the middle and index fingers. The right hand then advances the tube distally through the cords as the index and middle fingers of the left palpating hand press forward to prevent the tube from slipping posteriorly into the esophagus. *Note:* At this point the tube/stylet combination may encounter resistance, especially if the distal curve of the tube is sharp. This usually means that the tube tip is pressing on the anterior wall of the thyroid cartilage. Pulling back slightly on the stylet will allow the tube to conform to the anatomy, and the tube should slip into the trachea.

10. Confirm placement of the tube using the confirmation protocol taught in Chapter 5 of the textbook.

OPTIONAL SKILL 2: TRANSILLUMINATION (LIGHTED STYLET)

Minimum instructors needed: 1

Objectives

Upon completion of this skill station, the student should be able to:

1. Perform endotracheal intubation by the transillumination method.

2. Describe the advantages of this technique.

The transillumination or lighted stylet method of endotracheal intubation is based on the fact that a bright light inserted inside the upper airway can be seen through the soft tissues of the neck when inside the larynx or trachea. This permits the intubator to guide the tube tip through the glottic opening without directly visualizing the cords. It has been called the indirect visual method, and it has been shown in several studies to be reliable, quick, and atraumatic. It is particularly attractive in trauma patients because it appears to move the head and neck less than conventional orotracheal methods.

Equipment

- Stylet—the lighted stylet is a malleable wire connecting a proximal battery housing to a distal lightbulb and covered with a tough plastic coating that prevents the light from being separated from the wire. The wire stylet part is 25 cm in length. An on/off switch is located at the proximal end of the battery housing.

- Endotracheal tubes—all tubes should be 7.5- to 8.5-mm internal diameter and should be cut to 25 cm to accommodate the stylet.

- Other equipment is the same as listed for the Digital Intubation skill station.

Important Points

The success of this method of intubation will depend on several factors:

1. The level of ambient light

2. Pulling forward on the patient's tongue, or tongue and jaw

3. The bend of the tube-stylet

The light should be cut down to about 10% of normal, or the neck should be shielded from direct sun or bright daylight. Although the transilluminated light can be perceived in thin patients even in daylight, success will be more likely in darker surroundings.

Pulling forward on the tongue (or tongue and jaw) lifts the epiglottis up out of the way. This is essential to this method.

The tube-stylet combination should be bent just proximal to the cuff. A bend that is too far proximal will cause the tube to strike against the posterior pharyngeal wall and prevent the tube from advancing anteriorly through the glottic opening. The lubricated stylet is slipped into the tube and held firmly against the battery housings while the tube-stylet is bent. Bend more sharply if the patient is not in the sniffing position.

Procedure

1. Perform routine preparation procedures as taught in Chapter 5 of the textbook.

2. The intubator stands or kneels on either side facing the patient's head. Wear gloves for the procedure. The light is turned on.

3. The intubator grasps the patient's tongue (or, more easily, the tongue and jaw) and draws it gently forward while slipping the liberally lubricated tube-stylet combination down the tongue.

4. Using a "soup ladle" motion, the epiglottis is "hooked up" by the tube-stylet, and the transilluminated light can be seen in the midline. Correct placement at or beyond the cords is indicated by the appearance of a circumscribed, easily perceived light at the level of the larynge-

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al prominence. A dull glow, diffuse and difficult to see, indicates esophageal placement.

5. When the light is seen, the stylet is held firmly in place and the fingers of the other hand support the tube lying along the tongue as they advance the tube off the stylet more distally into the larynx.

6. Confirm placement of the tube using the confirmation protocol taught in Chapter 5 of the textbook.

OPTIONAL SKILL 3: TRANSLARYNGEAL JET VENTILATION

Minimum instructors needed: 1

Objectives

Upon completion of this skill station, the student should be able to:

1. Perform translaryngeal jet ventilation.

2. Discuss indications for this procedure.

When the airway cannot be maintained because of obstruction or partial obstruction above the cords, access below the level of the cords is needed. Translaryngeal jet ventilation (TLJV) provides a quick, reliable, and relatively safe method of adequate oxygenation and ventilation, especially in the trauma patient.

Equipment

The tools needed for TLJV should be prepared well in advance and stored in a small bag or kit:

- 14- or 13-gauge cannula, with side holes—these sizes are the minimum necessary for adequate ventilation. Side holes are especially important because they prevent the cannula from remaining against the tracheal wall and subjecting it to sudden pressures that could rupture it.

- 5-cc syringe filled with 1 or 2 cc of saline

- Manual jet ventilator devices—these commercially available devices are merely valves that allow high-pressure oxygen to flow through them when a button is pushed. They should have high-pressure tubing attached solidly with special fasteners and tape.

- Wrench—attach a small wrench to the jet ventilator tubing so that no time will be lost looking for a way to tap into the oxygen tank or turn it on.

- Cricoid stick mannequin.

Important Points

Many misconceptions and erroneous impressions persist about this technique, and the medical literature is in a state of flux on the subject. Clinical experience and studies done using appropriate equipment in both animals and patients clearly indicate the following:

1. Patients can be both oxygenated and ventilated with this technique, which delivers 100% oxygen in volumes exceeding one liter per second.

2. Ventilation can proceed indefinitely, provided the correct size cannula is used with the proper driving pressure.

3. Cannula of 14 gauge or larger, with side holes, must be used.

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4. Driving pressures of at least 50 psi must be used to deliver sufficient volumes to ensure adequate ventilation.

Patients cannot be ventilated using small-bore cannulas with continuous flow oxygen attached. The forgoing principles must be adhered to if this technique is to be used safely and effectively.

Procedure

Identification of the cricothyroid membrane is essential to this technique, although placement between the tracheal rings would probably not result in major complications.

1. While continuing attempts at ventilation and oxygenation, puncture the cricothyroid membrane with the cannula firmly attached to a 5-cc syringe filled with 1 or 2 cc of saline. Several milliliters of 2% Lidocaine can be used instead of saline, to produce local anesthesia of the mucosa in the area of the distal port of the cannula.

2. Direct the cannula downward, with continual aspiration to promptly demonstrate entry into the larynx, identified when bubbles of air are readily aspirated. At this point, if lidocaine is contained in the syringe, it can be injected to provide some anesthesia and prevent the coughing that sometimes occurs in those patients who are somewhat responsive.

3. On entry into the larynx, slide the cannula off the needle trochar and hold it in place while the TLJV is connected to the proximal port of the cannula.

4. The patient is immediately ventilated using one-second bursts of oxygen from the 50-psi manual source. The rate used is at least 20/minute (i.e., an inspiratory/expiratory ratio of

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1:2).

5. If a tie is available, fix the cannula in place. Tape can also be used, but fasten it firmly to the cannula and then around the patient's neck. Firm pressure at the site of insertion can reduce the small amount of subcutaneous emphysema that usually occurs with this technique.

OPTIONAL SKILL 4: ESOPHAGEAL TRACHEAL COMBITUBE®

Minimum instructors needed: 1

Objectives

Upon completion of this skill station, the student should be able to:

1. Explain the five important points about use of this airway.

2. Correctly insert the Combitube.

Introduced in the early 1970s, blind insertion airway devices (BIADs) were designed for use by EMS personnel who were not trained to intubate the trachea. All of those devices (Combitube®, Rusch Easy Tube®, and King LT-D™ airway) were designed to be inserted into the pharynx without the need for a laryngoscope to visualize where the tube is going. All of them have a tube with an inflatable cuff that is designed to seal the esophagus, thus helping to prevent vomiting and aspiration of stomach contents, as well as preventing gastric distention during bag-mask or demand-valve mask ventilation. It also was thought that by sealing the esophagus, more air would enter the lungs and ventilation would be improved. The devices have their own dangers and require careful evaluation to be sure that they are in the correct position. This class of airway is now referred to as *supraglottic airways*. None of the BIADs are equal to the endotracheal tube, which has become the invasive airway of choice for advanced EMS providers.

The Combitube has a double lumen. The two lumens are separated by a partition. (See Figure 11 in Optional Skills file on Resource Central - Additional Resources.) One tube is sealed at the distal end, and there are perforations in the area of the tube that would be in the pharynx. When the long tube is in the esophagus, the patient is ventilated through this short tube. The long tube is open at the distal end, and it has a cuff that is blown up to seal the esophagus or the trachea, depending on which it has entered. When inserted, if the long tube goes into the esophagus, the cuff is inflated and the patient is ventilated through the short tube. If the long tube goes into the trachea, the cuff is inflated and the patient is ventilated through the long tube.

This device has a pharyngeal balloon that seals the pharynx and prevents blood and mucus from entering the airway from above. As with the other BIADs, you must be sure that you are ventilating the lungs and not the stomach.

Equipment

Item	Quantity
Adult intubation mannequins	2
Combitube airways	2
Cans of silicone lubricant spray	2
35-cc syringes	2
Bag-valve devices	2
Nonsterile rubber gloves	1 box
Face shields or goggles	2

Important Points

You must remember five important points about the Combitube.

- Use the Combitube only in patients who are unresponsive and without protective reflexes.

- Do not use it in any patient with injury to the esophagus (e.g., caustic ingestions) or in children who are below the age of 15 and of average height and weight.

- Pay careful attention to proper placement. Unrecognized intratracheal placement of the long tube is a lethal complication that produces complete airway obstruction. Such an occurrence is not always easy to detect, and the results are catastrophic. One of the great disadvantages of this airway is the fact that you can determine correct placement only by auscultation and observation of chest movement, and both may be quite unreliable in the prehospital setting.

Use capnography to confirm airway placement, and monitoring position of the airway is recommended.

- You must insert it gently and without force.

- If the patient regains consciousness, you must remove the Combitube because it will cause retching and vomiting.

Procedure (Refer to Figures 11 and 12 in Optional Skills file on Resource Central - Additional Resources.)

1.   With the neck stabilized in a neutral position, insert the tube blindly, watching for the two black rings on the Combitube that are used for measuring the depth of insertion. The rings should be positioned between the teeth and the lips (Figure 11).

2.   Use the large syringe to inflate the pharyngeal cuff with 100 cc of air. When inflated, the Combitube will seat itself in the posterior pharynx behind the hard palate.

3.   Use the small syringe to fill the distal cuff with 10 to 15 cc of air.

4.   The long tube will usually go into the esophagus. Ventilate through the esophageal connector. It is the external tube that is the longer of the two and is marked no. 1. You must see the chest rise, hear breath sounds, feel good compliance, and hear no breath sounds over the epigastrium to be sure that the long tube is in the esophagus.

5.   If you do not see the chest rise, hear breath sounds, feel good compliance, and you hear

breath sounds over the epigastrium, the tube has been placed in the trachea (Figure 12). In

this case, change the ventilator to the shorter tracheal connector, which is marked no. 2.

Again you must check to see the chest rise, hear breath sounds, feel good compliance, and

hear no breath sounds over the epigastrium to be sure that you are ventilating the lungs.

    As with the other BIADs, if the patient becomes conscious, you must remove the Combitube.

Extubation is likely to cause vomiting, so be prepared to suction the pharynx and turn the

backboard.

OPTIONAL SKILL 5: KING LT-D™ AIRWAY

Minimum instructors needed: 1

Objectives

Upon completion of this skill station, the student should be able to:

1. Explain the six important points about use of this airway.

2. Correctly insert the King LT-D airway.

Introduced in the early 1970s, blind insertion airway devices (BIADs) were designed for use by EMS personnel who were not trained to intubate the trachea. All of those devices (Combitube®, Rusch Easy Tube®, and King LT-D™ airway) were designed to be inserted into the pharynx without the need for a laryngoscope to visualize where the tube is going. All of them have a tube with an inflatable cuff that is designed to seal the esophagus, thus helping to prevent vomiting and aspiration of stomach contents, as well as preventing gastric distention during bag-mask or demand-valve mask ventilation. It also was thought that by sealing the esophagus, more air would enter the lungs and ventilation would be improved. The devices have their own dangers and require careful evaluation to be sure that they are in the correct position. This class of airway is now referred to as *supraglottic airways*. None of the BIADs are equal to the endotracheal tube, which has become the invasive airway of choice for advanced EMS providers.

The King LT-D airway differs from the Combitube in that it has a single lumen. (See Figure 13 in Optional Skills file on Resource Central - Additional Resources.) Once the tube is inserted into the esophagus, both the esophageal and pharyngeal cuffs are inflated and the patient is ventilated through the single tube. With the airway in place you may be able to insert a bougie or a fiber-optic bronchoscope through the ventilating tube and swap the airway for an endotracheal tube, although it is not always successful. There is also an LT(S)-D airway that has a port through which you can insert a gastric tube to decompress the stomach. It is inserted exactly the same as is the LT-D airway. The King LT-D airway is quicker and easier to insert than the Combitube, but as with the other BIADs, you must be sure that you are ventilating the lungs and not the stomach. The King LT-D comes in five sizes for persons ranging in height from taller than 6 feet down to 35 inches.

Equipment

Item	Quantity
Adult intubation mannequins	2
King LT-D airway	2
Cans of silicon lubricant spray	2
35-cc syringes	2
Tonsil suction tip (Yaunker) and suction tubing	2
Bag-valve devices	2
Nonsterile rubber gloves	1 box
Face sheilds or goggles	2
Tube holder with bite block	2

Important Points

You must remember six important points about the King LT-D airway.

- Use the King LT-D airway only in patients who are unresponsive and without protective re-flexes.

- Do not use it in any patient with injury to the esophagus (e.g., caustic ingestions) or in chil-dren who are below the age of 15 and of average height and weight.

- Do not use in patients who are less than 35 inches tall.

- Pay careful attention to proper placement. Unrecognized intratracheal placement of the tube is a lethal complication that produces complete airway obstruction. Such an occurrence is not

always easy to detect, and the results are catastrophic. Capnography is recommended for confirmation of tube placement.

- You must insert it gently and without force.

- If the patient regains consciousness, you must remove the airway because it will cause retching and vomiting.

Procedure (Refer to Figures 14 through 18 in Optional Skills file on Resource Central - Additional Resources.)

1. Select the correct size King LT-D airway.

- Size 2 (green connector color) is for children 35 to 45 inches in height (or 12-25 kg).

- Size 2.5 (orange connector color) is for children 41 to 51 inches feet in height (or 25-35 kg).

- Size 3 (yellow connector color) is for adults 4 to 5 feet in height.

- Size 4 (red connector color) is for adults 5 to 6 feet in height.

- Size 5 (purple connector color) is for adults greater than 6 feet in height.

2. Test cuff inflation system for air leak.

3. Apply water-soluble lubricant to the distal tip.

4. Hold the airway at the connector with your dominant hand. With the neck stabilized in a neutral position, hold the mouth open and apply a chin lift with your nondominant hand. Using a lateral approach, introduce the tip into the mouth (Figure 14).

5. Advance the tip behind the base of the tongue while rotating the tube back to the midline so that the blue orientation line faces the chin of the patient (Figure 15).

6. Without exerting excessive force, advance tube until base of connector is aligned with teeth or gums (Figure 16).

7. Hold the KLT 900 Cuff Pressure Gauge in nondominant hand, inflate the cuffs of the King LT-D with air to a pressure of 60 cm H_2O (Figure 17). If a cuff pressure gauge is not available and a syringe is being used to inflate the King LT-D, inflate cuffs with the minimum volume necessary to seal the airway at the peak ventilatory pressure employed (just seal volume). Typical inflation volumes are as follows:

- Size 2 (green) = 25–35 mL

- Size 2.5 (orange) = 30–40 mL

- Size 3 (yellow) = 45–60 mL

- Size 4 (red) = 60–80 mL

- Size 5 (purple) = 70–90 mL

8. Attach the resuscitator bag to the airway. While bagging the patient, gently withdraw the tube until ventilation becomes easy and free flowing (Figure 18). Adjust cuff inflation if necessary to obtain a seal of the airway at the peak ventilatory pressure employed. You must see the chest rise, hear breath sounds, feel good compliance, and hear no breath sounds over the epigastrium to be sure that the King LT-D airway is correctly placed. However, this method is unreliable, and thus capnography is recommended for confirming and monitoring the position of the tube.

As with the other BIADs, if the patient becomes conscious, you must remove the airway.

Extubation is likely to cause vomiting, so be prepared to suction the pharynx and turn the

backboard.

OPTIONAL SKILL 6: LARYNGEAL MASK AIRWAY

Minimum instructors needed:1

Objectives

Upon completion of this skill station, the student should be able to:

1 .Explain the nine important points about use of the airway.

2. Correctly insert the laryngeal mask airway (LMA).

The insertion technique presented here is for the LMA. There are a number of similar devices

available on the market as of the date of publication of the manual. If one of these devices is

used in a system and/or class, the instructor should substitute the manufacturer's specific

instructions for those presented here. ITLS is not able to include specific instructions for every

airway device currently available for use and encourages instructors to use additional sources of

information for specific devices.

The LMA was developed for use as an alternative to the face mask for achieving and

maintaining control of the airway during routine anesthetic procedures in the operating room.

Because it does not protect the airway against vomiting and aspiration, it was meant to be used in

patients who had been fasting and thus had an empty stomach. It was later found to be useful in the emergency situation when intubation is not possible and you cannot ventilate with a bag-mask. It may prevent having to do a surgical procedure to open the airway. The LMA is another supraglottic BIAD, but differs from the others in that it was never designed to seal the esophagus and was not originally meant for emergency use. It is not equal to the endotracheal tube and should be used only when efforts to intubate the trachea have been unsuccessful and ventilation is compromised.

Important Points

- Use the LMA only in patients who are unresponsive and without protective reflexes. If the patient still has a gag reflex, the LMA may cause laryngospasm or vomiting.

- Do not use it in any patient with injury to the esophagus (e.g., caustic ingestions) or in children who weigh less than 30 kg.

- Lubricate only the posterior surface of the LMA to avoid blockage of the aperture or aspiration of the lubricant.

- Patients should be adequately monitored (constant visual monitoring, cardiac monitor, and, if possible, pulse oximeter) at all times during LMA use.

- To avoid trauma to the airway, force should never be used during LMA insertion.

- Never overinflate the cuff after insertion. Overinflation may cause malposition, loss of seal, or trauma. Cuff pressure should be checked periodically, especially if nitrous oxide is used.

- If airway problems persist or ventilation is inadequate, the LMA should be removed and re-inserted, or an airway established by other means.

- The LMA does not prevent aspiration if the patient vomits. The presence of a nasogastric tube does not rule out the possibility of regurgitation and may even make regurgitation more likely because the tube makes the esophageal sphincter incompetent.

- If the patient regains consciousness, you must remove the LMA because it will cause retching and vomiting.

Equipment

Item	Quantity
Adult intubation mannequins	2
LMAs	2
Cans of silicone lubricant spray	2
35-cc syringes	2
Tosil suction tip (Yankauer) and suction tubing	2
Bag-valve devices	2
Nonsterile rubber gloves	1 box
Face sheilds or goggles	2
Tube holder with bite block	2

Procedure (Refer to Figure 19 and Table 1 in Optional Skills file on Resource Central - Additional Resources.)

1. With the neck stabilized in a neutral position, ventilate with mouth-to-mask or bag-mask and suction the pharynx before insertion of the airway.

2. Remove the valve tab and check the integrity of the LMA cuff by inflating with the maximum volume of air. (See Table 1)

3. The cuff of the LMA should be tightly deflated using the enclosed syringe so that it forms a flat oval disk with the rim facing away from the aperture. This can be accomplished by pressing the mask with its hollow side down on a sterile flat surface.(Figure 19a). Use the fingers to guide the cuff into an oval shape and attempt to eliminate any wrinkles on the distal edge of the cuff. A completely flat and smooth leading edge facilitates insertion, avoids contact with the epiglottis, and is important to ensure success when positioning the device (Figure 19b)

4. Lubricate the posterior surface of the LMA with a water-soluble lubricant just before insertion.

5. Pre-oxygenate (do not hyperventilate) the patient.

6. If there is no danger of spinal injury, position the patient with the neck flexed and the head extended. If the mechanism of injury suggests the potential for spinal injury, the head and neck must be maintained in a neutral position.

7. Hold the LMA like a pen, with the index finger placed at the junction of the cuff and the tube (Figure 19c). Under direct vision, press the tip of the cuff upward against the hard palate and flatten the cuff against it. (Figure 19d). The black line on the airway tube should be oriented anteriorly toward the upper lip.

8. Use the index finger to guide the LMA, pressing upward and backward toward the ears in one smooth movement (Figure 19e). Advance the LMA into the hypopharynx until definite resistance is felt (Figure 19f).

9. Before removing the index finger, gently press down on the tube with the other hand to prevent the LMA from being pulled out of place (Figure 19g).

10. Without holding the tube, inflate the cuff with just enough air to obtain a seal. The maximum volumes are shown in Table 1.

11. Connect the LMA to the bag-mask and employ manual ventilation of less than 20 cm H_2O. (This precludes use of a flow-restricted oxygen-powered ventilation device [FROPVD] unless you use one that allows you to set the pressure.) As with the BIADs, you must see the chest rise, hear breath sounds, feel good compliance, and hear no breath sounds over the epigastrium to be sure that the LMA is correctly placed. However, this method is unreliable, so use of capnography to confirm and monitor tube position is recommended.

12. Insert a bite block (not an oropharyngeal airway) and secure the LMA with tape (Figure 19h). Remember that the LMA does not protect the airway from aspiration. If the patient becomes conscious, the LMA must be removed. Extubation is likely to cause vomiting, so be prepared to suction the pharynx and turn the backboard.

OPTIONAL SKILL 7: ADULT INTRAOSSEOUS INFUSION WITH THE F.A.S.T.1

Minimum instructors needed: 1

Objectives

Upon completion of this skill station, the student should be able to:

1. Explain the indications for the use of adult intraosseous infusion.

2. Perform an adult intraosseous infusion using the F.A.S.T.1.

Standard vascular access in the adult patient involves the peripheral venous system. Under conditions common in trauma, the peripheral veins often collapse. In the past, adult intraosseous infusion was used in some cases to give medications, but the flow rate was too slow to be used for fluid resuscitation of adult trauma patients. Now devices are available that allow adult intraosseous infusion to be used for fluid resuscitation and for administration of medications. All of the devices may fail to reach the marrow cavity in very obese persons.

The F.A.S.T.1 uses the sternum for the intraosseous site because of the following:

- The sternal body is large and relatively flat, and can be readily located.

- The sternum retains a high proportion of red marrow.

- It has a thinner, more uniform cortical bone overlying a relatively uniform marrow space.

- It is less likely to be fractured than the extremities, particularly at the level of the manubrium.

- It is usually exposed, or easy to expose, in a trauma patient.

- The recommended infusion site on the midline of the manubrium, 15 mm below the sternal notch, is easy to locate and landmark.

- There is no appreciable time lag between central venous infusion and intraosseous infusion of most substances. For adult trauma patients who need fluid resuscitation or medications and for whom you are unable to quickly obtain a peripheral IV line, this device may be the vascular access of choice. It is fast (60–90 seconds), simple (failure rate < 5%), safe (the device positions the infusion tube at a controlled depth), and has adequate flow rates (30

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mL/minute by gravity, 125 mL/minute by pressure-cuffed IV bag, and 250 mL/minute by syringe).

Indications

- The adult patient who is in cardiac arrest and in whom you cannot quickly obtain peripheral venous access

- Hypovolemic adult patients who have a prolonged transport and in whom you are unable to quickly (two sticks or 90 seconds) obtain peripheral venous access

Contraindications

- Fractured sternum

- Recent sternotomy (may have compromised the integrity of the manubrium or its vascularization)

- Severe osteoporosis or bone-softening conditions

Important Points

- As with all advanced procedures, this technique must be accepted local protocol, and you must obtain medical direction orally or by protocol before performing it.

- If infiltration occurs (rare), you must abort the procedure. This is the only bone in which this device is used.

- Potential complications are subperiosteal infusion due to improper placement, osteomyelitis, sepsis, fat embolism, and marrow damage. Studies have shown the complications to be rare. However, good aseptic technique is important, just as with IV therapy.

Equipment

1. Several configurations are available for F.A.S.T.1 training, depending on available resources. Basic commercial packages are the F.A.S.T.1 SIM IO System, F.A.S.T.1 Training System, and F.A.S.T.1 Training Kit. Realsim can be added with the F.A.S.T.1 Trainer, F.A.S.T.1 Adult Sternal IO Simulator, or Adult Sternal Intraosseous Infusion mannequin.

2. Nonsterile gloves

Procedure

1. Place the target patch at the site. The single recommended site of insertion is the adult manubrium, on the midline and 1.5 cm (5/80) below the sternal notch. The site is prepped with aseptic technique, and the index finger is used to align the target patch with the patient's sternal notch.

2. With the patch securely attached to the patient's skin, the introducer is placed in the target zone, perpendicular to the skin. A firm push on the introducer releases the infusion tube into the correct site and to the right penetration depth. The introducer is pulled straight back, exposing the infusion tube and a two-part support sleeve, which falls away.

3. Correct placement is verified by observation of marrow entering the infusion tube. The

    infusion tube is joined to tubing on the patch, which is connected to a purged source of

    fluid. Fluid can now flow to the patient.

4. The protector dome is pressed down firmly over the target patch to engage the VELCRO

    fastening. The site is clearly visible through the dome, the infusion tube and connection

    tubing move easily with any strain on the skin, and the site requires no further stabilization

    while the patient is transported.

    Note that a new model of the F.A.S.T.1 has been developed (F.A.S.T.x), but it was not

available for evaluation in time for publication.

OPTIONAL SKILL 8: DRUG-ASSISTED INTUBATION (FORMERLY KNOWN AS

RAPID SEQUENCE INTUBATION [RSI])

Minimum instructors needed: 1

Objectives

Upon completion of this skill station, the student should be able to:

1. Discuss the situations in which drug-assisted intubation (DAI) can be of benefit to the patient.

2. Discuss the situations in which DAI can be detrimental to the patient.

3. Correctly perform DAI.

The importance of appropriately managing the airway of the trauma patient cannot be overemphasized. Loss of airway remains the leading cause of early preventable trauma deaths, and hypoxia has been shown to worsen outcomes for trauma patients, especially those with closed head injury. The indications for active airway management and the options for managing the airway are well covered in Chapter 4, and the skills for managing the airway are detailed in Chapter 5 of the textbook. All responders should be familiar with the materials in those two chapters and be able to apply this care.

When EMS first obtained the ability to perform endotracheal intubation, it was essentially performed on "dead" patients: those unresponsive and apneic. Not all patients fit this situation; and airway management of patients who were agitated, were combative, or had airway trauma had to wait until they deteriorated and became unresponsive.

It is important to remember that all airways managed in the field meet the American Society of Anesthesiologists' definition of a *difficult airway*. Thus the responder must have many "tools" in the toolbox available to manage the airway of the trauma patient. Popular in EMS circles, one tool in the toolbox for airway management (one that addresses the preceding problem) is drug-assisted intubation (DAI). The formerly used term *rapid sequence intubation* is a misnomer because the procedure is certainly not rapid (See Figure 20 in Optional Skills file on Resource Central – Additional Resources). Because of this, it can adversely affect patient outcome by prolonging scene time. Unless there is a critical need, the procedure should be performed during transport. In the urban setting where there are short transport times, the need for definitive airway should be balanced against use of other airway methods and the impact on transport times.

As a variant of the practice of rapid sequence induction used by anesthesiologists when confronted with a nonfasting patient, the technique allows the intubator to achieve conditions that improve the likelihood of intubating the patient, while minimizing the risks of aspiration, by rapidly administering a sedative and paralytic to improve intubating conditions. In some jurisdictions, a paralytic is not used, and benzodiazepines and opiates in combination are administered to achieve intubating conditions.

Numerous studies have shown that EMS personnel can be effectively taught to use DAI and apply it in the field setting. Other studies have shown a potential for prolonged hypoxia during this procedure. This means constant recording of pulse oximetry reading should be done; and there should be a strict quality improvement program that monitors intubation time, oxygenation of the patient, and scene time.

The actual technique of DAI is quite simple. The difficult part for EMS personnel is to recognize the patient who should *not* undergo DAI. The worst thing you can do in airway management is take a spontaneously breathing patient and place her into a "cannot intubate and cannot ventilate" situation. All personnel who utilize DAI should be not only familiar with and able to use one of the many supraglottic blind insertion airway devices (BIADs) but also able to perform a cricothyroidotomy if unable to ventilate or intubate the patient.

Last (but most important of all), all EMS personnel should be able to manage an airway using a bag-mask. Remember BLS comes before ALS. Some EMS providers erroneously see use of DAI and even intubation as a measure of "prestige." It is simply one of many tools available to manage an airway. The real trick is to choose the right one for your patient and correctly apply it.

Performance of DAI in the field remains controversial. Some studies have shown worse outcome in patients (especially serious head injuries) who undergo DAI in the field, and this is attributed to longer scene times. Other studies question whether this delay is significant. Also there is the related issue of transport times. Short times to definitive trauma care may allow for less invasive airway management, as long as the airway can be kept opened and adequate ventilation and oxygenation assured.

Other concerns raised with this technique include skill retention on the part of field providers, something that is an issue for many of the advanced procedures performed by EMS.

The decision to implement the use of DAI by an EMS system should be carefully reviewed, especially with respect to issues of skill retention, transport times, and the availability of alternative airway methods. Any system using DAI must have in place a strong educational and quality improvement program.

Equipment

Item	Quantity
Adult intubation mannequins	2
Adult cuffes ET tubes (7, 7.5 or 8 m	2
Wire guides for adult ET tubes	2

Laryngoscope handles	4
Spare batteries for laryngoscopes	8
Spare bulbs for laryngoscopes	4
Adult laryngoscope blades (curved and straight)	2 each
Can of silicone lubricant spray	1
10-cc syringes	2
Oral airways (size to fit mannequin)	2
Tonsil suction tip (Yankauer) and suction tubing	2
Bag-valve devices	2
Nonsterile rubber gloves	1 box
Face sheilds or goggles	2
10-cc syringes (empty) labeled for drugs	10
CO_2 detector (optional)	1
Esphageal detection device (optional)	1

Procedure

The ideal approach uses the six Ps: preparation, preoxygenation, premedicate, paralyze, pass the tube, confirm position:

1. *Preparation.* First, evaluate the difficulty you may experience when you try to intubate. Do this by using the Mallampati score (see Chapter 4 of the textbook). If the patient appears to be particularly difficult to intubate, you would be better served using a supraglottic BIAD or bag-mask than struggling with a paralyzed, apneic, hypoxic patient. If you decide to perform DAI, you should have a plan for an escape airway should intubation be unsuccessful. All necessary equipment, including suction, should be readily available and checked.

Proper positioning is an important part of preparation. While the EMS environment often precludes placing the patient at a good height, on a stretcher, in the sniffing position, any steps you can take to better position yourself so that you have the best view are helpful. Given that many of your patients are in spinal motion restriction, one "positioning step" you can take, just prior to intubation, is to remove or loosen the cervical collar and apply in-line stabilization. This will allow you to move the jaw forward and improve visualization of the cords.

2. *Preoxygenation.* Because the patient will be rendered apneic, hypoxia will rapidly follow. To extend the time for intubation, nitrogen in the lungs is "washed out" by having the patient breathe 100% oxygen for 2 to 3 minutes. Washout of the nitrogen allows the patient to tolerate up to 5 minutes of apnea (only 2 to 3 minutes in children) during intubation without becoming hypoxic. In patients with airway compromise or other problems, ventilations can be assisted, though care should be made not to ventilate with too much force, thus reducing the risk of insufflating air into the stomach and thus regurgitation of stomach contents leading to aspiration. Application of cricoid pressure (Sellick maneuver) will help reduce this, as well as reduce risk of

aspiration as the lower esophageal sphincter relaxes after administration of paralytic. All patients should be placed on a cardiac monitor, a pulse oximeter, and a capnometer at this time, if not previously done.

3. *Premedicate.* Both the act of intubation and some paralytics can raise intracranial pressure. Though advocated in the past, use of IV lidocaine prior to intubation has been found to be of no benefit in the field setting. Pediatric patients given succinylcholine may develop bradycardia. Most experts feel that pediatric patients and those adults receiving a repeat dose of succinylcholine should receive 0.1 mg/kg of atropine. Remember also in the pediatric patient that the use of a length-based system, such as the Broselow® tape or something similar, can decrease dosing errors. Depolarizing paralytic agents such as succinylcholine can cause fasciculations, which can cause a rise in both intracranial pressure and intraocular pressure as well as be uncomfortable for the patient. A nondepolarizing blocking agent such as vecuronium at 0.01 mg/kg can be given at 3 minutes prior to administering the paralytic agent. Because it adds time to the process in what is often a time-critical situation, many field providers omit this step.

The last premedication is the sedative. This ensures that the patient is not awake while paralyzed. Benzodiazepines such as Versed at 0.1 mg/kg can be used, athough Etomidate (0.3 mg/kg) is a more common sedative agent and has the advantages in that it has minimal effects on hemodynamics. Some trauma surgeons do not support use of Etomidate due to reported adrenal suppression, with even a single dose.

4. *Paralyze.* Two types of paralytics are available. A depolarizing agent, such as succinylcho-
    line, is the preferred agent due to rapid onset of action and rapid degradation. At a dose of
    1.0 to 1.5 mg/kg (2 mg/kg in children), intubating conditions are achieved within 90 se-

conds of administration and clear within 5 minutes. Contraindications to the use of depolarizing agents are listed in Table 2 in the Optional Skills file on Resource Central.

Nondepolarizing agents have a longer onset and paralysis lasts longer. The fastest acting agent is rocuronium (0.5 mg/kg adult; 0.75 mg/kg in children). Vecuronium 0.1 mg/kg can be used to maintain paralysis after intubation is successful.

5. *Pass the tube.* Once intubating conditions are achieved, pass the tube. Aids in the process include the use of a stylet, the gum elastic bougie, and external laryngeal manipulation.

6. *Confirm position.* Use techniques described in Chapter 5 of the textbook. Use of capnography is mandatory so that inadvertent tube dislodgement can be detected. See the ideal timeline for DAI in Table 3 in the Optional Skills file on Resource Central.

GLASGOW COMA SCORE

Eye Opening		Verbal Response		Motor Response	
	Points	Points			Points
Spontaneous	4	Oriented	5	Obeys commands	6
To voice	3	Confused	4	Localizes pain	5
To pain	2	Inappropriate words	3	Withdraws	4
None	1	Incomprehensible sounds	2	Abnormal flexion	3*
		Silent	1	Abnormal extension	2**

No movement   1

*Decorticate posturing to pain

**Decerebrate posturing to pain

NOTES

MOULAGE

The purpose of makeup or moulage is to help the student's assessment by making the patient situation more realistic. The students will get the feel of an emergency situation more easily if the patient has injuries that appear genuine. Beautiful but delicate makeup is often destroyed before the first group of students is through their practice; thus, you must use judgment in applying makeup. Many injuries or signs of injury (distended neck veins, deviated trachea, sucking chest wound, flail chest) can be shown better (and longer) by simply writing on a piece of white tape and sticking it to the skin in the appropriate place. If the student examines the patient and sees "distended neck veins" and "trachea deviated to the right" written on the tape, the effect is better than having to ask the instructor or having to guess what smudged or "fallen off" moulage once represented. Makeup is probably best used to simulate cyanosis or shock, bruising, lacerations, burns, or abrasions. Having an experienced makeup artist prepare the models is preferable, but with a little knowledge and practice, the average person can do a surprisingly good job.

Selecting Models

Treatment of the multiple trauma patient requires exposure of the injured areas, including the chest, so less embarrassment is involved if most of the models are male (the pregnant patient, of course, is best portrayed by a female). Warn all models (especially female) to wear bathing suits or other suitable attire under their clothes.

If the "patients" have some knowledge of the symptoms pertaining to their "injuries," it will add to the realism. EMTs and nurses often make the best "patients," and it is a learning experience for them. The faculty in each station should discuss with the model exactly how to portray

his or her injuries. If you choose to do moulage, allow a minimum of 2 hours for model preparation.

Makeup Kit

A wound simulation kit is commercially available. It contains artificial blood, other makeup materials, and various plastic or rubber simulated injuries to be attached to the skin. You can assemble your own makeup kit at considerable savings. The following lists include many of the items necessary. Almost all of the material can be found at local hardware, grocery, or drugstore.

Item	*Quantity*
Isopropyl alcohol	1 bottle
Vaseline®	1 jar
Paper towels	2 rolls
K-Y® Jelly	2 tubes
Cold cream	1 jar
Small hair dryer	1
Facial tissues	1 box
Glycerin	1 bottle
Spray bottle	2
Assorted sponges (to apply makeup)	
Saran™ Wrap (plastic wrap)	1 roll

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Rubber condoms	6
Red, blue, and black felt-tip pens	1 each
Can of waterless hand cleaner	1
Alka-Seltzer® tablets	1 small bottle
Makeup colors: maroon, red, white, blue, brown, yellow, flesh, black	
Artificial blood (theatrical supply)	1 pack
Plumber's putty (get at hardware store; it takes the place of mortician's wax)	1 can
Duo® surgical adhesive (theatrical supply)	1 bottle
Grease stick, black	1
Activated charcoal	1 small container
Irrigation bulb (to apply charcoal)	1
Tongue depressors (to mold putty)	1 box
Toothpicks (to mold putty)	1 box
Soft and stiff bristled artist brushes	1 each
Scissors	1 pair
Rubber gloves (unsterile)	1 box

Additional Materials:

Pieces of bone (from baked chicken or turkey)

Black blood (for the depths of wounds)—mix charcoal, white petrolatum, and blood powder.

Coagulated blood—mix K-Y Jelly and powdered blood.

Regular blood—mix Sta-Flo® liquid starch and food coloring or powdered blood.

Sweat (diaphoresis)—mix two parts glycerin and one part water. Use in spray bottle.

Ashes

Dirt

Pieces of broken clear plastic or Plexiglas®

Skin Preparation

On areas where makeup is to be applied, first apply a thin layer of cold cream. This is very important for makeup removal later. In areas where wounds are to be attached (glued prostheses or molded putty), clean the skin of all oil and grease with a paper towel and alcohol.

Wound Simulation

Applying makeup color is better done with rubber gloves or the small sponges than with your bare fingers. When using putty, use a tongue blade and a toothpick to smooth and shape.

- *Shock.* Use white makeup. Apply a *small* amount to the center of the forehead and each cheek. Smooth it out uniformly until the skin has a pale appearance. Do not apply the

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makeup too heavily or the model will look like a clown.

- *Cyanosis.* Use medium blue makeup. Apply a tiny amount to the nose, lips, earlobes, and fingernails. It is best to use this in conjunction with the "shock" makeup.

- *Diaphoresis.* Mix two parts glycerin and one part water in a spray bottle. Spray it on the patient just before the student begins evaluation. Keep out of patient's eyes—it burns.

- *Blood.* Simulated blood is used in wounds and on clothing to give a dramatic effect. You will need blood of regular consistency, "clotted" blood, and "black" blood. Be very careful when using artificial blood, because it stains carpet and even some tile. Place a plastic sheet under the patient to prevent the blood from coming into contact with tile or carpet.

- *Burns.* Cover the area with a thin layer of red or maroon makeup. Do not smooth it out uniformly; burns are not uniform. Now scatter several "blisters" of Vaseline over the area. Cover this with Saran wrap or facial tissue and press it down. You will have very realistic blisters where the Saran wrap covers the globs of Vaseline. Facial tissue can be torn to look like broken blisters. Apply black grease paint around the edges of the Saran wrap. Spray the area with a small amount of the glycerin–water mixture, and apply a thin layer of ashes, which should cover the edges well and give a uniform appearance. Don burned clothing.

- *Basilar skull fracture.* Put a few drops of blood in either ear. Allow a small amount to trickle down the face. Apply black makeup around eyes to simulate "raccoon eyes."

- *Abrasions.* Apply maroon liner to the area with a makeup brush or sponge. Smooth and thin the edges so they blend into the skin. Cover the wound with a thick layer of Duo surgical adhesive and dry with hair dryer. When it is dry, pick and tear the center of the adhesive to re-

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semble sloughed, abraded skin. Rub a small amount of maroon and red cream over and under the adhesive layer. Apply a small amount of glycerin and then clotted blood. Dirt also adds a realistic touch.

- *Contusions.* Because bruises are usually raised in the center, it is best to use an area of bony prominence for bruises. Apply red and maroon cream, mixed together. Thin the outside edge in an irregular manner. Use a brush to apply blue liner to the outer one-third of the red-maroon area. Do not blend in completely. It should have a mottled appearance.

- *Lacerations.* First clean the skin well with alcohol. With plumber's putty, fashion a thin layer (1/8-inch thick at the thickest part) on the clean skin. Feather the edges. Use the edge of the tongue blade to make a gash across the putty. Use flesh-colored makeup over the entire area and the surrounding skin to blend the putty and skin. Apply black blood to the depth of the wound. Mix clotted blood and ashes and dab the mixture on the area; then pour a small amount of blood into the gash and allow it to trickle down.

- *Sucking chest wound.* Clean the skin with alcohol. Apply putty with one-half of an Alka-Seltzer tablet embedded in it. Feather the edges, and make a hole in the putty to resemble a penetrating wound. Apply maroon or red makeup. Dab on a mixture of blood and ashes. Now make a hole down to the Alka-Seltzer tablet. Just before the student comes in, pour a small amount of artificial blood down the hole onto the tablet. It will bubble like a sucking chest wound.

- *Penetrating object.* This wound is simulated with the same technique as lacerations and sucking chest wounds. Use enough putty to secure the penetrating object. Do not use heavy objects (they will pull the putty loose) or sharp objects (they may cause real lacerations). Use

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plastic, not glass.

- *Protruding intestines.* You may use the commercial moulage for this or make very realistic intestines from two rubber condoms filled with K-Y Jelly. The ends are tied off and wrapped around each other to simulate loops of intestines. Vascular markings are made with the red and blue felt-tip pens. Attach these to the skin, and apply clotted and regular artificial blood.

- *Open fractures.* Commercial moulage is best for this, but if you must, apply and blend putty to the area. Incise the putty with a toothpick or tongue blade, and then apply makeup to simulate bruised and torn flesh. Use black blood in the base of the wound, and then add bone fragments (small) and clotted blood.

Clothing

A good source of old clothing (other than your closet) is the Salvation Army or Goodwill store. It usually has some clothing in poor condition, which can be purchased for very little cost. Get the largest sizes available. If you plan to teach courses regularly, it is best to cut the clothing at the seams and sew in VELCRO strips so the clothing can be "ripped open" for exam of the patient and then stuck back together for the next group.