

PRINCETON RESCUE SQUAD
Critical Care Transport (CCT)



Course Syllabus
&
Student Handbook

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Signature Form

(To be remitted to Paula Johnson, Education Director)

Acknowledgement of Policies, Procedures and Requirements

I have received a copy of the Student Handbook for Princeton Rescue Squad's – Critical Care Transport (CCT) Training Program.

These policies, procedures and requirements have been completely explained to me by the Course Instructor and I fully understand them.

I realize that non-compliance may result in dismissal from the course.

I understand that should a question arise concerning any aspect of this Training Program I should contact Paula Johnson, Education Director, at the earliest appropriate time.

CCT Student Signature

CCT Student Name (Print)

Date ____/____/____

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Mission

To effectively and professionally provide a quality education to those students enrolled in educational programs.

To fulfill our mission, the administration, faculty, and educational staff are committed to and focused on the educational endeavors of our student participants.

PREFACE

This Course Syllabus & Student Handbook is designed to provide a source of information for the Critical Care Transport (CCT) Program. As a student, your actions are governed by numerous policies with various sources. **It is your responsibility to be aware of all of these policies.**

Policies and procedures that are program-specific (CCT Students only) are located within this Handbook.

Information related to institutional policies and procedures can be found in the ***Princeton Rescue Squad Education Catalog***.

Princeton Rescue Squad Education Catalog:

All policies and procedures included in the catalog apply to all students at Princeton Rescue Squad. In the Princeton Rescue Squad Education Catalog, you will find information about people on the campuses, information regarding services available to you, and a description of selected policies and procedures designed to create student success. You may access the Princeton Rescue Squad Education Catalog on the official website by clicking on Classes and clicking the pdf file "Princeton Rescue Squad Education Catalog".



Course:	Critical Care Transport
Medical Director	Dr. Sherri Ross, DO
Education Director:	Paula Johnson, M.Ed., NCEE, NRP
Office Hours:	0900-1700
Course Location:	Princeton Rescue Squad – Educational Institute
Times:	0900-1700
Dates:	Thursdays Beginning: 8/17/23 Ending: 12/7/23
Course Delivery Method	Traditional
Required Text	“Critical Care Transport” (AAOS); Jones & Bartlett Publishing, 2e., ISBN: 978-1-284-04099-9
Pre-Requisite(s)	Please review the “ <i>Registration Information for Critical Care Transport Program</i> ” Packet for details

Course Description:

To provide experienced Paramedics and Registered Nurses with the knowledge and skills necessary to deliver outstanding advanced care for the critical patient during transfers between hospitals, specialty referral centers, and extended care facilities.

Learning Outcomes:

Upon successful completion of the CCT Education Program, the student will be able to:

1. Sit for the West Virginia OEMS CCT Certification Exam.
2. Utilize effective therapeutic communication and advanced assessment skills consistent with the role of the professional CCT to maintain and/or improve patient care in the interfacility setting under the guidance of physician provided orders.
3. Understand and appreciate the legal-ethical issues that influence critical decision-making in the interfacility transport environment.
4. Apply critical thinking and problem-solving skills to formulate and implement advanced emergency care based on assessment findings for a critically ill patient.
5. Identify and implement strategies to reduce morbidity and mortality during interfacility transports.

Instructional Procedures:

This program will meet once per week for 8 hours over a period of 16 weeks. Each week, the sessions will consist of lecture and/or laboratory components geared specifically to meet the foundational knowledge of the student interested in obtaining WV-CCT certification. Methods for instruction will not be limited to lecture but will include hands-on experience with typical equipment utilized in the field via scenario-based training and simulation level education to enhance critical thinking and decision-making skills.

Procedures for Evaluation:

Students must maintain an overall grade point average (GPA) of at least 76% in order to complete the course. The student’s academic standing will be discussed with him/her at regular intervals throughout the program. Any student who falls below 76% at the completion of the program will not be released to sit for the WV OEMS CCT examination.

Grading Components and Weights:

The CCT student’s grade will be the sum of the weighted scores comprising the parameters of course work outlined below.

Formative Assessments:	Summative Assessments:
Quiz = 15%	Exam = 50%
Affective Evaluation = 5%	Case Simulation Exam = 30%

Grading Scale:

100-90 = A 89-83 = B 82-76 = C 75-69 = D <68 = F

All students must maintain a “C” average at the completion of each module to continue throughout the course.

Students are expected to complete all work as assigned. Students may only make up a missed exam with prior approval of the Program Director. Missed exams must be made up within one week and cannot be made up during scheduled class time. Written exams that are not made up within a week’s time frame a grade of “0%” will be recorded for that test.

Students will be provided a progress report at regular intervals(increments no longer than 25% of the program), at midterm, and at the end of the CCT course on cognitive, psychomotor and affective performance.

Clinical Internship:

In addition to classroom sessions, all students MUST complete **24 hours of clinical internship** in the following categories:

Unit:	Required Hours:
Field Internship	24

Failure to complete the above listed clinical requirements AND/OR failure to submit ALL mandatory supporting documentation prior to the completion of the course will result in an incomplete grade. Any student assigned an “incomplete” is ineligible for testing and would result in failure of the course.

Attendance:

All material is important to your success; therefore, students absent more than 1 class session without a valid excuse will be dismissed from the course.

There are two types of absences recognized as a “valid excuse” by Princeton Rescue Squad’s Education Department: (1) absence resulting from participation in an activity where you are officially representing the Education Department; and (2) absence caused by unforeseeable and unavoidable circumstance which is beyond your control. All other absences are considered willful and will not count as excused. It is your responsibility to provide your instructor with a proper explanation and documentation of these valid absences. It is the responsibility of the student to make up any work or testing missed.

Tardiness will not be tolerated. Any student who shows up later than 15 minutes into the beginning of a course or leaving a class session 30 minutes or more before the end of the class day will result in the mark of tardy on his/her record. An accumulation of 5 tardies will result in an unexcused absence.

Academic Dishonesty:

As a student and pre-hospital professional, you are expected to adhere to a professional code of conduct and not engage in plagiarism, cheating, falsifying information or records, or any other such activity. Failure to adhere to this code of conduct will result in disciplinary action up to and including dismissal from the program.

Grounds for Dismissal:

A student may be dismissed from the program for the following reasons:

1. Absenteeism greater than 1 unexcused class session.

2. Receiving a “D” or “F” as a cumulative GPA.
3. Insubordination (in classroom or in clinical)
4. The conviction and/or known use of, distribution of, or possession of illegal drugs, or controlled substances.
5. Failure to accomplish clinical assignments and objectives
6. Unprofessional or unethical conduct
7. Cheating in related or professional EMS courses or in clinical documentation.

Appeal Procedures

Any student who is dismissed from the program has a right to file an appeal on the decision. Appeal forms can be obtained from the Program Director. Once an appeal form has been filed with the Program Director, all supporting documentation and evidence from the Faculty and student will be submitted to the Medical Director and Advisory Committee for review. The case may be resolved at this level, or if thought warranted by the Advisory Board or requested in writing by the student the case shall be forwarded to the CEO, COO, and Board of Directors.

The CEO, COO, and Board of Directors shall present to the accused student and the person making the accusation written notification of the charges which shall include:

- A statement that a hearing will be held before the Board of Directors, together with the notice of the date, time, and place of the hearing.
- A clear statement of the facts and evidence to be presented in support of the charges made.

A recommendation by the Board of Directors for imposition of sanctions is final. The Board of Directors may also recommend that the imposition of sanctions be held in abeyance where appropriate.

A student may request readmission after one calendar year. It shall be the responsibility of the student to provide the Education Director, CEO, and COO with reasons why he/she should be given special consideration for readmission. He/she may do this by letter, by scheduled appearance before the group, or both.

Privacy Policy

As progress reports and course completion material are maintained by the Princeton Rescue Squad’s Education Department; CCT Program, we are required to follow the Family Educational Rights and Privacy Act of 1974, or FERPA.

FERPA protects the privacy of student records. The act governs the release of educational records and the student’s right to view your educational records and request corrections of any inaccuracies. FERPA also covers the procedures for release of such directory information as your name, address, social security number, date of birth,

and phone number; as well as, maintaining policy that requests for access to such information be limited.

Student Advisory & Evaluations

If the CCT Instructor should feel the need to have a mandatory meeting with a student to discuss an item(s) or subject(s) of concern, to include, but not limited to:

Excessive absences and tardiness, failure to turn in assignments / clinical rotations on time, classroom / clinical behavior concerns, plagiarism, cheating, struggling or failure to maintain a GPA of 70%, etc.

A Student Advisory Form will be filled out and signed by both the Faculty member addressing the concern, and the student. Once the concern has been documented, the CCT Program Instructor and student will discuss possible resolutions to the problem and a proposed action plan will be written on the Advisory Form. The student may use the Advisory Form to record a rebuttal against the initial concern or proposed action plan. The instructor will then mark the form “unresolved” and forward it to the CCT Program Director who will make a determination on a second Advisory Form. Copies of these completed Advisory Forms are available to the student; however, originals must and will be retained by the CCT Program.

Health & Safety:

It is expected that the student’s physical examination indicates that he/she is physically and emotionally capable of performing the objectives of the program. Maintenance of health is the responsibility of the student. It is requested that the student report any change in their health status to the Program Instructor. A physician’s report of a student’s current health status may be requested by the Program Instructor as indicated by the student’s behavior and/or physical appearance at any time during the program.

If a student is or becomes pregnant during this course, she must file a statement from her physician including medical instructions that will allow or disallow her participation in the required clinical exposures and activities. It shall be the responsibility of the student to inform, and keep informed, her physician as to what these exposures and activities will be during this program.

There must be adequate safeguard for the health, safety and privacy of patients, faculty and students. All incidents of conflict, injury, etc. are to be reported to the Program Instructor immediately.

Any student who, while enrolled in this training program, violates any federal, state or local law or procedure, or hospital guideline or policy relating to Emergency Medical Services operation or their safety sensitive position may be subject to suspension or administrative dismissal from the CCT program.

In Case of Injury:

All students participating in the Princeton Rescue Squad's Education Department CCT Program are required to report any injury, near miss or unsafe activity that occurs in conjunction with activities performed during classroom, laboratory, or clinical sessions.

Incident Forms can be obtained from the faculty and are to be presented to the Education Director within 24 hours. Examples of reportable incidents include:

1. Motor Vehicle Accident involving a student during clinical rotation.
2. Student injuries or near misses occurring in the classroom, practical lab or clinical sites.
3. Potential or actual patient injury involving or witnessed by a clinical student.
4. A student witnessing another individual involved in questionable, Potentially unsafe or illegal activity in conjunction with the Education Program.
5. Any instance when a student wants a written report.

Social Justice Statement:

Consistent with its comprehensive mission and recognizing that the development of human potential is a fundamental goal in a democratic society, Princeton Rescue Squad's Education Department promotes an system that values cultural and ethnic diversity and understanding; that provides for the preparation of students for full and meaningful participation in a changing world; and that promotes equitable and fair treatment in every aspect of campus life and employment for all persons regardless of race, national origin, gender, sexual preference, sexual orientation, age, religion, veteran status or disability.

Clinical Objectives:

The main objective of clinical rotations is to allow the student to observe and apply learned knowledge and skills they have obtain during classroom and lab activities. The student will have a set number of clinical hours as well as specific goals that they must meet during their clinical rotations. A review of the Clinical Objectives, required documentation, and completion competencies will be discussed with the students by the designated Clinical Coordinator or Faculty member prior to the start of clinical rotations.

During clinical rotation's the student is operating under the medical license and guidance of this program's medical director and no other physician is responsible for the students' activity during their internship. You have one week from the date of the clinical rotation to submit your paperwork for that date. If documentation is not received in that time frame, you will receive negative deductions on your affective evaluation report.

Pre-clinical Requirements:

Before any student is permitted to attend internship, he/she must:

1. Submit all required immunity records
 - a. MMR
 - b. TDAP
 - c. Hep B
 - d. TB Skin Testing (PPD)
 - e. Seasonal flu shot (*if attending clinical between 10/1 and 4/30*)
2. Must have completed and passed a criminal background check as directed by the WVOEMS.
3. Submit the signed "Student Clinical Responsibilities" Document to the Instructional Faculty.
4. Submit requests detailing the following criteria to the designated faculty **with a minimum of 2 weeks advanced notice:**
 - a. Date of Internship Rotation
 - b. Location of Internship (hospital unit/EMS agency)
 - c. Time of Internship Rotation

Student Expectations While Attending Clinical Internship:

1. Appropriate dress for the clinical rotation will include:
 - a. Dark blue or black work-type pants.
 - b. Official Princeton Rescue Squad's Education Department polo indicating the EMS program of study with the appropriate PRS Educational Institute logo.
 - c. Black shoes. Boots are preferred in the field and black soft-shoes are preferred in the hospital setting.
 - d. Students must wear ID badges for all clinical rotations and the ID badge needs to be surrendered to the Instructor at the end of the program.
 - e. The student cannot wear any non-Princeton Rescue Squad's Education Department symbols or lapel pins on uniform shirt or cap.
 - f. The student should not wear a cap during clinical rotations inside the hospital and the only allowable cap/hat during field rotations is a Princeton Rescue Squad cap or plain dark blue/black cap.
 - g. Long hair should be pulled up and away from the face.
 - h. No visible piercings unless it is a female student wearing post earrings only.
2. While performing clinical rotations, students are to follow the EMS Code of Ethics (Integrity, Compassion, Accountability, Respect, Empathy):

- a. Whether the student is interacting with staff, families, or patients, any deviation in behavior noted by the preceptor is grounds for dismissal and termination of that day's clinical rotation.
3. While performing clinical rotations, students are to:
 - a. Perform **ONLY** the skills they are signed off to perform on live patients.
 - b. Make good use of time.
 - c. Assist staff with their needs.
 - d. Ask questions as they arise in response to patient care plans, skills review, and other appropriate questions specific to their paramedic education.
4. While performing clinical rotations, the student will keep with them at all times:
 - a. The CCT Syllabi and Course Handbook
 - b. A copy of the Preceptor Orientation Manual
 - c. Copies of the Clinical/Field Shift Evaluation Worksheet

Transportation to/from Clinical:

- Transportation to and from all clinical assignments is the responsibility of the student.
- If the student is unable to make clinical site due to car trouble, it is the student's responsibility to notify that clinical area at least one (1) hour before schedule starting time.
- Some clinical areas are a distance from course site or home and students may wish to combine clinical areas with other students to carpool to the site.

Employment during Clinical:

- The student may complete his/her clinical internship time at location of employment but the student **MAY NOT** complete clinical hours during regular scheduled paid time.
- The student missing class or clinical due to a conflicting working schedule will be marked with an unexcused absence.
- The tardiness in class related to work would be added as an absence as any other tardy times will.
- Special squad education sessions required for a student's employment that interferes with scheduled class time will be excused, if a copy or letter of attendance is submitted to the program coordinator. This student is required to make up time (hours) missed. Arrangements can be made with program coordinator.

Clinical Attendance:

- The student should be at each clinical site at least 15 minutes before scheduled time.
- If the student is unable to make clinical site for any reason, See Transportation (above).

- The student is supposed to complete all clinical rotations as scheduled. If the student needs to reschedule a rotation, it is the student's responsibility to notify the clinical coordinator.
- It is the student's responsibility to complete clinical sheets and to hand deliver these forms to the instructor. The recommendation is to turn in completed forms at least once per week.
- Attendance is required. Missing two (2) clinical rotations without a valid excuse will cause the student to be dismissed from the program. Tardiness of 15 minutes or more, or early departure of 30 minutes or greater from an assigned clinical internship will result in a mark of tardy on the student's record. Accumulating 5 tardies will result in 1 unexcused absence.

Successful Completion of Internship:

For a student to meet the criteria of successful completion for the internship component of the program, he/she MUST provide the following:

1. Complete all hours designated below:

Unit:	Required Hours:
Field Internship	24

2. Provide the following documentation for EACH Internship Rotation:

Hospital Unit:	EMS (Field) Internship:
<ul style="list-style-type: none"> • "Clinical" Shift Evaluation Worksheet 	<ul style="list-style-type: none"> • "Field" Internship Shift Evaluation Worksheet
<ul style="list-style-type: none"> • Student Evaluation of Clinical Preceptor 	<ul style="list-style-type: none"> • "CCT – PCR" on ALL documented patient assessment encounters
	<ul style="list-style-type: none"> • Skills Checklist for CCT
	<ul style="list-style-type: none"> • Student Evaluation of Clinical Preceptor

Recommended Timeline for Internship Completion:

Clinical Experiences should occur after the student has demonstrated competence in skills and knowledge in the didactic and laboratory components of the course.

Field Internship: On or After Week 7 of the program

Preceptor Clinical Training Guidelines:

The following pages give you guidance on the actions that EMS students are allowed to perform in each individual clinical setting/unit to which he/she is assigned. REMINDER: Only skills that have been signed off by the Instructor can be performed in the clinical setting. At any time a preceptor or department manager can request the student's documentation to identify/verify appropriate skills.

1. Observe and obtain patients history and complete physical exam.
2. Review chart thoroughly including labs, radiology reports and physicians progress notes.
3. Review any radiology films available
4. Observe and participate with the maintenance of basic and advanced airway management.
 - a. Suctioning
 - i. Orally
 - ii. Nasally
 - iii. Endotracheally
 - iv. Tracheally
 - b. Oxygen administration by various devices
 - c. Incentive Spirometer
 - d. Chest PT
 - e. Administration of Breathing Treatments
5. Observe and assist with peripheral or central IV placement and maintenance, including Swan Ganz Catheters, and focusing on:
 - a. Sterile techniques
 - b. Cardiac output
 - c. Pulmonary artery wedge pressure
 - d. All swan pressure readings and wave forms
6. Observe and assist with administration of medications as well as calculating drug doses on their own and showing work on the skill sheet. Participants must calculate all IV infusions that the patient would be receiving.
7. Observation and assist with Pulse Ox, ETCO₂, pressure reading on ventilators, Accucheck, etc.
8. Read 12 Lead EKG's of patient and compares finding with preceptor and document finding on clinical skills sheets.
9. Observe IABP mechanics, inflation/deflation waveforms, timing ratio, and troubleshooting.
10. Observe ICP pressure monitoring devices, waveforms, maintenance and releasing of pressure.

CCT COURSE

VERIFICATION OF SKILL COMPETENCIES

STUDENT NAME: _____

The above-named student is qualified to perform any BLS or ALS procedures within the scope of the WVOEMS protocol. Additionally, the student is qualified to perform any of the following procedures while under the direct supervision of the Clinical Preceptor or his Designated Representative. **The Student is only allowed to perform the skills with the Instructor's signature in the appropriate box designated for that skill.**

NAME OF SKILL	DATE COMPETENCY MET:	INSTRUCTOR VERIFICATION:
Medication Administration		
Drug Calculations		
Endotracheal Tube Insertion		
King/Combi-tube Insertion		
LMA Insertion		
Ventilator Operations		
Rapid Sequence Intubation		
Chest Decompression		
Cricothyrotomy		
12 Lead ECG Interpretation		
Hemodynamic Monitoring Devices		

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Clinical Internship Expectations:

The following agreement is between the Princeton Rescue Squad's Education Department–CCT Program and the student of said school.

1. Recognize that I am responsible for my own pre-hospital professional behavior and am required to be able to perform all activities taught in the CCT course.
2. Secure consultation and/or assistance of the clinical preceptor in those clinical areas if I am unsure and/or inexperienced. I will make specific time arrangement with the instructors/coordinator when indicated.
3. Recognize that CCT clinical hours are a **LEARNING** experience rather than a work experience. I will be responsible to learn as much as possible from each clinical experience and document as required.
4. As a student I am not allowed to be paid as an employee while attending internship rotations and/or perform CCT level skills and assessments during employment hours.
5. Evaluate my own learning experiences and progress. I will determine if I need special kind of learning experiences, inform the clinical lab instructor or coordinator, and keep the required record of experiences gained and needed.
6. Schedule any non-emergency appointments (doctor, dental, etc.) after class or clinical times.
7. Assume responsibility for transportation to and from assigned areas. I will not expect any special considerations of hours worked or school days off in order to meet this responsibility.
8. Notify Princeton Rescue Squad's Education Director if ill and unable to attend class or notify the clinical site at the hospital/ambulance service if unable to attend clinical. I will notify these persons each day in case of an extended illness. Notification will be before the scheduled class or clinical time not during or after the class or clinical time.
9. Be aware of the fact that any situation that indicates cheating or lying or that I have plagiarized for any purpose (tests, papers, etc.) will be reviewed by all faculty members and myself. I recognize that the faculty will then act, which can result in an "F" for the course and dismissal from the program.
10. Recognized that the clinical component of the CCT program is extremely important and that all students are expected to complete all clinical required hours. I recognized that failure to complete semester clinical would result in an "Incomplete" and the inability to sit for the WVOEMS certification examination.
11. Observation by faculty/ clinical preceptor in a clinical setting is a mandatory requirement in order to pass a practicum course.
12. Please recognize that avoidable tardiness is both rude and inconsiderate to both the instructors and peers. Tardiness definition is any period of up to 15 minutes after class has begun. If I am tardy five (5) times during the CCT internship or class sessions, then I recognize that this will then become an absence from a class period. I should recognize that after six (6) tardy episodes I would expect to have a conference with instructors or coordinator regarding dismissal from the program.
13. Assume accountability for professional conduct and appropriate moral and ethical behaviors that include truthfulness, confidentiality, and an awareness of patient's rights.

Student Name: _____

Student Signature: _____ Date: _____

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MODULE 1

INTRODUCTION TO CRITICAL CARE TRANSPORT (CCT)

Goal:

Student will identify, relate and apply the roles and responsibilities involved in being a member of the Critical Care Transport (CCT) team, describe the approach to common medical/legal issues related to interfacility transfer, and interpret data collected from the sending facility for the purpose of recognizing and treating patients with abnormal values or radiologic findings.

Objectives:

Upon completion of this module, the student will be able to:

1. Define the terms *critical care*, *critical care transport*, *critical care patient*, and *critical care transport professional* (p 1).
2. Differentiate between interfacility and specialty care transport (p 2).
3. Describe the composition of the critical care transport team (p 2).
4. List the qualifications of members of a critical care transport team (p 2).
5. Identify the modes of transportation used during critical care transports, including mobile (ground) units, rotor-wing aircraft, and fixed-wing aircraft (p 3).
6. Discuss the differences between the modes of transportation (p 3).
7. Discuss the advantages and disadvantages for each mode of transportation (pp 5–6).
8. Describe the role of dispatch in determining the mode of transportation (p 5).
9. Describe the steps involved in the transport process (p 5).
10. Discuss how the decision for ground transport versus air transport is made (p 6).
11. Describe the role of medical control in the critical care transport environment (p 6).
12. Discuss state and national standards for critical care transport (p 7).
13. Discuss reimbursement criteria and their relevance to critical care transport (p 7).
14. Identify stresses specific to the critical care transport professional and their signs (p 7).
15. Discuss ways to ensure safety for both critical care transport professionals and their patients (p 8).
16. Discuss the importance of interpersonal communications with the patient and family members (p 9).
17. Explain the process of quality assurance and improvement, and understand the importance of

maintaining skills and knowledge (p 9).

18. Summarize the history of critical care transports, both air and ground (p 10).

Medical-Legal Issues

- 1.** Discuss the Emergency Medical Treatment and Active Labor Act (EMTALA), its implications for critical care transport, and the potential consequences of violating the law (p 18).
- 2.** Discuss the general concepts established by current EMTALA case law (p 20).
- 3.** Identify areas of potential liability for critical care transport professionals (CCTPs) and transport agencies (p 21).
- 4.** Describe how the transport provider's certification level and scope of practice affect the steps of planning and executing a critical care transport (p 22).
- 5.** Recognize patient rights and the legal risks and liabilities they pose in critical care transport (p 22).
- 6.** Describe the legal principles of consent and negligence (pp 23–24).
- 7.** State the major steps and pertinent issues in accepting a patient transfer (pp 24–26).
- 8.** State the major steps and pertinent issues in assessing and preparing a patient for transfer (p 27).
- 9.** State the responsibilities of CCTPs during transport (p 27).
- 10.** Explain the role of other health care providers who accompany the patient during transport (pp 27–28).
- 11.** Discuss the ways in which communications capabilities and agreements about medical direction affect medical decision making in the transport environment (p 27).
- 12.** State the major steps and pertinent issues in transferring care to the receiving facility (pp 27–28).
- 13.** Describe how risks can be minimized in the critical care transport environment (p 28).
- 14.** Explain accurate and complete documentation for a transport; include its critical nature in protecting against liability claims (p 29).

Laboratory Analysis and Diagnostic Studies

- 1.** Understand the overall principles of laboratory analysis (p 232).
- 2.** Understand the difference between sensitivity and specificity (p 232).
- 3.** Discuss the difference between specimen culture and sensitivity (p 234).
- 4.** Understand relevant basic chemistry and biochemistry (p 234).

5. Recognize the most commonly ordered laboratory tests done in the emergency department and in the intensive care unit (p 235).
6. Understand the importance of abnormal laboratory results as they relate to patient condition (p 242).
7. Discuss the causes of abnormal laboratory results (pp 235–244, 247–252).
8. Explain the proper procedure for collecting blood specimens (p 244).
9. Identify the proper test tubes used for collecting blood specimens (p 246).
10. Recognize which point-of-care testing may be performed during transport (p 246).
11. Describe normal and abnormal values obtained during urinalysis and their implications (p 247).
12. Understand the basics of diagnostic imaging, including the standard radiograph, computed tomography, magnetic resonance imaging, and ultrasound (p 249).

MODULE 2

PHARMACOLOGY & PATIENT ASSESSMENT

Goal:

Student to integrate pathophysiological principles of pharmacology and the patient assessment findings to formulate an impression and implement and/or continue a pharmacological management plan for the critical care patient.

Objectives:

At the conclusion of this module, the student will be able to:

1. Discuss the unique aspects of patient assessment as they relate to scene calls and interfacility transports, and modifications to assessments based on the individual transport setting (p 86).
2. Discuss the importance of critical thinking to clinical decision making and differential diagnosis (p 86).
3. Explain the necessity for the critical care transport provider to utilize physical and technological assessment findings to develop a clear clinical picture (p 87).
4. Identify similarities and differences in assessment as they relate to scene calls and interfacility transport (p 87).
5. Explain the importance of making prompt initial contact with the patient's family and the patient care team, including the physician, nurse, and ancillary support personnel (p 87).
6. Review the elements of the patient care record of concern to the critical care transport professional and how they relate to the physical assessment (p 88).
7. Discuss the differences in depth and focus of the physician's and nurse's assessments

as compared to the paramedic's assessment, and the elements of these assessments relevant to stabilization and transport (p 92).

8. Describe a systems-based approach to assessment of the patient at the bedside, incorporating laboratory findings, diagnostic imaging findings, and ancillary technology:

- Assessment of general appearance (p 92)
- Cardiovascular assessment (p 92)
- Respiratory assessment (p 95)
- Neurologic assessment (p 97)
- Gastrointestinal assessment (p 99)
- Genitourinary assessment (p 100)
- Musculoskeletal assessment (p 101)
- Psychosocial and emotional assessment (p 101)

9. Describe the inherent instability of the transport environment, and the potential need to adjust infusion settings, ventilator settings, and pain relief and/or sedation as the patient's condition demands (p 91).

10. Describe unique stabilization, packaging, and transport considerations for technology-dependent patients (p 95).

11. Explain the importance of continuous reassessment during transport, especially for technology-dependent patients (p 103).

12. Discuss the elements of the patient handoff report necessary to assure continuity of care at the transport destination (p 104).

1. Identify reliable resources of medication and pharmacology information (p 182).

2. Outline the principles of medication administration for CCTPs, including patient and medication selection, predicted and desired responses, absorption and elimination principles, side effects or adverse medication reactions, and transport and monitoring considerations (p 182).

3. Discuss the significance of medication pharmacokinetics and pharmacodynamics in the critical care transport setting (p 183).

4. Review principles of medication management, including storage of drugs and maintaining the security of controlled substances (p 189).

5. Discuss the different types and classes of medication used in the critical care arena (p 189).

6. Understand the sequence for medication infusion (p 223).

7. Know how to infuse medication with an infusion pump during transport and through changes in altitude (p 223).

MODULE 3

CARDIAC MANAGEMENT

Goal:

Students will be able to appropriately manage the cardiovascular patient through physical assessment, interpretation, and utilization of adjunct modalities, including but not limited to, 12-lead ECG monitoring, invasive electrical therapy, balloon pump support, and pharmacological therapies.

Objectives:

At the conclusion of this module, the CCT applicant will be able to:

1. Describe the anatomy and physiology of the cardiovascular system (p 458).
2. Describe how to monitor a patient by using electrocardiography (ECG) during a critical care transport (p 464).
3. Explain how to correctly place leads from a 12-lead ECG monitor (p 465).
4. Explain how to correctly place additional precordial leads for diagnosing right ventricular and posterior infarctions (p 465).
5. Discuss the step-by-step systematic approach that should be used when interpreting an ECG (p 467).
6. Explain how to determine the heart's electrical axis (p 469).
7. Describe how to identify a bundle branch block on an ECG (p 472).
8. Explain the management of a patient with a bundle branch block during critical care transport (p 474).
9. Describe how to identify a hemiblock on an ECG (p 475).
10. Explain the management of a patient with a hemiblock during critical care transport (p 476).
11. Describe the significance of ST-segment and T-wave changes (p 479).
12. Explain how ST-segment and T-wave changes are identified on an ECG (p 479).
13. Identify criteria suggestive of right and left atrial enlargement (p 479).
14. Describe the clinical implications of right and left atrial enlargement (p 479).
15. Identify criteria for determining the presence of left ventricular hypertrophy (LVH), right ventricular hypertrophy (RVH), and the presence of strain (p 480).
16. Describe the clinical significance of LVH, RVH, and the presence of strain (p 481).
17. Describe the ECG changes that indicate the presence of Wolff-Parkinson-White syndrome (p 482).
18. Identify ECG changes that could indicate the presence of pericarditis (p 483).
19. Describe the potential implications of a prolonged QT interval (p 483).
20. Describe how to identify ventricular tachycardia on an ECG, including when it occurs in conjunction with wide complex tachycardia (p 484).
21. Explain the management of a patient with ventricular tachycardia, including when it occurs in conjunction with wide complex tachycardia (p 485).
22. Describe ECG changes associated with electrolyte imbalances, such as hyperkalemia, hypokalemia, hypercalcemia, and hypocalcemia (p 485).

23. Explain the clinical implications of electrolyte imbalances, such as hyperkalemia, hypokalemia, hypercalcemia, and hypocalcemia (pp 486–489).
24. Describe ECG changes associated with digoxin toxicity (p 489).
25. Explain how to diagnose and manage digoxin toxicity (p 490).
26. Discuss the diagnosis and management of coronary artery disease and angina (p 490).
27. Explain the process underlying myocardial infarction, including the actions of cardiac enzymes, changes in blood supply, and the ischemia–injury–infarction pathway (p 490).
28. Describe the ECG changes associated with various types of myocardial infarction (pp 493–505).
29. Summarize the development of heart failure, including the associated signs and symptoms (p 506).
30. Generally describe the field of electrophysiology, including its purpose and capabilities (p 509).
31. Describe the spectrum of therapeutic options for patients with cardiac arrhythmias (p 510).
32. Explain the basic concepts underlying cardiac pacemaker technology (p 513).
33. Describe the general steps in pacemaker troubleshooting and the specifics of identifying and resolving problems with electromagnetic interference (p 516).
34. Recognize single- and dual-chamber pacing systems by their ECG characteristics (p 517).
35. Explain the purpose and function of atrioventricular pacing devices (p 518).
36. Describe the components and function of implantable cardioverter-defibrillators (ICDs) (p 519).
37. Explain the purpose of atrial tachycardia ICDs, wearable cardioverter-defibrillators, and subcutaneous ICDs (p 521).
38. Briefly identify the special considerations related to external defibrillation when an ICD is present (p 522).

MODULE 4

RESPIRATORY MANAGEMENT

Goal:

Students will develop an understanding and proficiency in using a variety of airway management techniques and equipment. Additionally, students will be able to perform a thorough assessment to formulate an impression and implement and/or continue a treatment plan for the critical patient suffering from respiratory compromise.

Objectives:

Upon completion of this module, students will be able to:

1. Summarize the anatomy and physiology of the respiratory system (pp 111-115).
2. Describe how ventilation and perfusion abnormalities affect blood gas values (p 114).
3. Name the five requirements for normal ventilation and oxygenation (p 116).
4. Define tidal volume, vital capacity, and minute volume (p 116).
5. Differentiate between obstructive and restrictive diseases (p 117).
6. Interpret normal and abnormal breath sounds (p 117).
7. Describe particular clinical events that alter the functioning of the respiratory system in the critical care patient (p 117).
8. Review the breath sound assessment technique used in critical care transport patients (p 118).
9. Perform a basic respiratory assessment for adequacy of ventilation and oxygenation using inspection, auscultation, palpation, and noninvasive monitoring (pp 118-122).
10. Identify abnormal respiratory patterns (p 119).
11. Assess a respiratory cycle (p 121).
12. Identify the parameters measured in arterial blood gas monitoring and which parameter reflects the effectiveness of ventilation and oxygenation (p 122).
13. Discuss basic airway management strategies (p 122).
14. Describe how pulse oximetry, capnometry, and capnography can be used to monitor respiratory function (p 122).
15. Identify the components of a ventilator circuit (p 160).
16. Differentiate between positive-pressure and negative-pressure ventilators (p 161).
17. Differentiate among pressure, volume ventilators, and flow- and time-cycled ventilators (p 161).
18. Differentiate between invasive and noninvasive ventilation (p 162).
19. Define the various modes of mechanical ventilation (p 164).
20. Define the ventilator parameters of tidal volume, fraction of inspired oxygen, respiratory rate, ratio of the length of expiration to inspiration (I:E) ratio, mode, and positive end-expiratory pressure (PEEP) (p 165).
21. Explain the use of PEEP (p 166).
22. Troubleshoot low pressure (disconnect), high pressure, power failure, and other common alarms (p 173).

MODULE 5

SHOCK MANAGEMENT

Goal:

Integrate comprehensive knowledge of causes and pathophysiology into the management of shock with focus on treatment, pharmacologic resources, and the hemodynamic monitoring used for the patient with circulatory compromise.

Objectives:

After completion of this module, the student will be able to:

1. Discuss cellular respiration (p 260).
2. Describe oxygen transport and utilization of oxygen by the cell (p 262).
3. Summarize the pathophysiology of shock and its stages: initial, compensatory, decompensatory (progressive), and refractory (irreversible) (pp 264–267).
4. Describe the clinical manifestations associated with the various shock states (p 267).
5. Explain the classification of shock: cardiogenic, hypovolemic, distributive (neurogenic and anaphylactic), and septic (p 268).
6. Identify from a patient presentation which type and stage of shock the patient is experiencing (pp 268–275).
7. Define the following terms: infection, sepsis, sepsis syndrome, systemic inflammatory response syndrome (SIRS), septic shock, and multiple organ dysfunction syndrome (MODS) (pp 267, 275–276, 278).
8. Describe the epidemiology and pathophysiology of shock, sepsis, SIRS, and MODS (p 277).
9. Describe the history and incidence of sepsis relative to mortality (p 277).
10. Identify the important risk factors for development of sepsis (p 277).
11. Describe new theories about the development of SIRS, including the four response stages (p 278).
12. Describe the mediators involved in the development of sepsis (p 276).
13. Recognize the individual organ manifestations related to the development of SIRS (p 276).
14. Identify the signs and symptoms that describe the patient in shock, sepsis, SIRS, or MODS (pp 270, 272–275, 283).
15. Discuss lab values associated with the patient with sepsis or MODS (p 267).
16. Discuss assessment and management of the patient with shock or MODS (pp 279–280).
17. List the parameters that should be monitored during the transport of a critical patient experiencing shock, sepsis, SIRS, or MODS (p 280).
18. Identify the interventions necessary during transport of the critically ill patient experiencing shock, sepsis, SIRS, or MODS (pp 271, 273–275, 283).
19. Discuss pharmacologic agents used in the treatment of the patient with shock or MODS (p 281).
20. Discuss blood administration, including the ABO blood system, various blood products, and the procedure for administering blood (p 284).
21. Describe the types of adverse transfusion reactions and their etiology (pp 289–291).
22. Summarize management concerns related to blood transfusions (p 291).

MODULE 6

TRAUMA & BURN MANAGEMENT

Goal:

The student will be able to perform a comprehensive assessment and formulate or continue a treatment plan for critical patients suffering from trauma and/or burn injuries.

Objectives:

After completion of this Module, the student will be able discuss and define the following:

1. Understand the critical care transport professional's (CCTP's) impact on preventing trauma deaths by performing proper prehospital care and transporting patients to the appropriate trauma center (p 302).
2. Understand the significance of trauma management on morbidity and mortality (p 303).
3. Understand Newton's first, second, and third laws of motion and how they relate to patterns of injury (p 303).
4. Discuss the types of trauma (p 304).
5. Explain the concept of triage and standard triage systems (START and JumpSTART) (p 305).
6. Understand the various trauma scoring systems, including the Glasgow Coma Scale, the trauma score, the revised trauma score, the Abbreviated Injury Scale, the Injury Severity Score, and the trauma injury severity score, and how they are used (pp 306–310).
7. Discuss the classifications of trauma centers defined by the American College of Surgeons' Committee on Trauma, including Level I, II, III, and IV trauma centers (p 310).
8. Discuss the American College of Surgeons' Committee on Trauma patient classifications (p 310).
9. Understand how to assess a patient in a hospital setting prior to interfacility transport (p 310).
10. Discuss the elements of the hypothermia–acidosis–coagulopathy triad, including how to manage them (p 311).
11. Understand how and when diagnostic imaging, including standard radiographs, computed tomography, ultrasonography, transthoracic echocardiography, transesophageal echocardiography, magnetic resonance imaging, and intra-abdominal pressure monitoring are used and their implications (p 312).
12. Explain how to recognize, assess, and manage the most common thoracic trauma injuries, including pneumothorax (open, simple, and tension), hemothorax, flail chest, pericardial tamponade, aortic dissection, myocardial contusion, diaphragmatic rupture, tracheobronchial disruption, pulmonary contusion, esophageal perforation, and traumatic asphyxia (pp 317–321).
13. Explain how to insert and manage a chest tube, including pigtail catheters (pp 323–327).
14. Describe how to recognize, assess, and manage ear, eye, neck, throat, and thyroid

trauma injuries (pp 336–341).

15. Describe the signs and symptoms and how to manage abdominal and pelvic injuries, including both hollow and solid organ injuries (pp 342–347).

16. Describe how to perform resuscitative endovascular balloon occlusion of the aorta (p 343).

17. Describe the different types of fractures, including how to manage them (p 348).

18. Explain how to recognize, monitor, and manage compartment syndrome, rhabdomyolysis, and crush syndrome (p 350).

19. Understand the specific trauma considerations for special populations (p 352).

1. Describe the layers and functions of the skin (p 434).

2. List the major causes of burn injury (p 435).

3. Describe the anatomy of a burn (p 435).

4. Explain the process of the body's systemic inflammatory response to a burn (p 435).

5. Explain the factors that determine the classification of burn injury, including body surface area and burn depth (p 436).

6. Describe the classifications of burn injuries, including superficial burns, partial-thickness burns, deep partial-thickness burns, full-thickness burns, subdermal burns, as well as major burns, moderate burns, and minor burns (p 437).

7. Identify the methods for calculating the total body surface area burned, including the rule of nines and the Lund-Browder chart (p 438).

8. Describe criteria for referral of patients to a burn center (p 438).

9. Discuss assessment considerations for a burn patient's airway, breathing, and circulation (p 439).

10. List situations in which the CCTP should suspect an inhalation injury (p 439).

11. Discuss the roles of edema and compartment syndrome in relation to a burn injury (p 440).

12. Describe the process of stopping a burn, including irrigation, cooling, decontamination, and special considerations (p 441).

13. Discuss management of a burn patient's airway, breathing, and circulation (p 441).

14. Explain various fluid resuscitation formulas, including the American Burn Association (ABA) *Advanced Life Support Course* 2010 guidelines and the Parkland formula (p 442).

15. Describe the parameters for adjusting the fluid infusion rate (p 443).

16. Describe how to manage and dress burn wounds (p 444).

17. Discuss pain management of burn patients (p 444).

18. Discuss special situations relating to burn injuries such as hypothermia, the need for gastric decompression, renal failure, and rhabdomyolysis (p 445).

19. Discuss management of specific burns, including ocular burns, facial burns, ear burns, circumferential burns, hand and foot burns, genitalia burns, pediatric burns, electrical burns, and chemical burns (pp 445–450).

20. List the types of burns that may suggest potential child maltreatment (p 448).

21. Discuss toxic epidermal necrolysis and Stevens-Johnson syndrome, including the similarity between their management and the management of patients with severe burns (p 451).

MODULE 7

MEDICAL EMERGENCY MANAGEMENT

Goal:

The student will integrate assessment findings to formulate a field impression and implement or continue a comprehensive treatment plan for a patient with a neurological, endocrinological, toxicological, infectious disease or environmental complaint.

Objectives:

After completion of this Module, the student will be able to discuss and define the following:

1. Describe the major anatomic structures of the nervous system and their physiology (pp 363–367).
2. Describe how to perform a neurologic assessment, including the following specific assessments: Mini-Mental Examination; assessment of speech abnormalities, cranial nerves, eyes, motor function, and sensory function; reflex testing; and evaluation of meningeal irritation and Lhermitte phenomenon (pp 376–387).
3. Discuss the pathophysiology of traumatic brain injury, including primary and secondary brain injuries (p 390).
4. Explain the significance of cerebral perfusion pressure and mean arterial pressure (p 391).
5. Discuss the pathophysiology of specific neurologic injuries, including scalp injuries, skull fractures, facial fractures, epidural hematoma, subdural hematoma, and diffuse axonal injury (pp 392–398).
6. Define intracranial pressure (ICP) (p 398).
7. Explain the pathophysiology of increased ICP (p 400).
8. Discuss clinical manifestations of increased ICP (p 400).
9. Discuss the concept of ICP monitoring, including indications, contraindications, complications, methods, and procedures (pp 400–405).
10. Describe the elements of multimodality monitoring (p 405).
11. Discuss management of ICP during transport (p 406).
12. Discuss the pathophysiology of brain herniation (p 408).
13. Describe spinal cord injuries, including primary and secondary spinal cord injuries, complete and incomplete spinal cord injuries, and spinal and neurogenic shock (pp 409–411).
14. Explain the assessment, management, and complications of spinal cord injuries (pp 411–413).
15. Discuss types of stroke, including their assessment and management, and the use of fibrinolytic therapy (pp 414–416).
16. Describe the pathophysiology and management of intracerebral hemorrhage (p 416).
17. Describe the pathophysiology and management of subarachnoid hemorrhage (p 416).
18. Describe the pathophysiology and management of Guillain-Barré syndrome (p 417).

19. Discuss seizures and epilepsy, including their transport management (p 417).
 20. Discuss transport considerations for patients with neurologic injuries—prior to transport, on scene, and during interhospital transport (p 418).
 21. Discuss considerations for managing neurologic emergencies in flight (p 419).
 1. Describe the anatomic structures and physiology of the endocrine system (p 666).
 2. Discuss the pathophysiology, assessment, and critical care transport management of conditions related to diabetes, including hypoglycemia, hyperglycemia, diabetic ketoacidosis, and hyperosmolar hyperglycemic nonketotic syndrome (p 669).
 3. Discuss the pathophysiology, assessment, and critical care transport management of pituitary disorders, including central diabetes insipidus, pituitary lesions, acromegaly, and gigantism (p 673).
 4. Discuss the pathophysiology, assessment, and critical care transport management of adrenal abnormalities, including adrenal insufficiency, Addison disease, Cushing disease, pheochromocytoma, aldosteronism, and amyloidosis (p 674).
 5. Discuss the pathophysiology, assessment, and critical care transport management of thyroid abnormalities, including hyperthyroidism, hypothyroidism, myxedema coma, thyrotoxicosis and thyroid storm, and Hashimoto disease (p 678).
 6. Discuss the pathophysiology, assessment, and critical care transport management of lipid disorders, including antiphospholipid syndrome and metabolic syndrome (p 681).
- Environmental Emergencies

1. Discuss risk factors for environmental emergencies (p 688).
2. Describe the process of thermoregulation, including the concepts of thermogenesis and thermolysis (p 688).
3. Explain the process of heat transfer, including radiation, conduction, convection, evaporation, and absorption (p 690).
4. Discuss signs, symptoms, and transport management of heat cramps (p 692).
5. Discuss signs, symptoms, and transport management of heat syncope (p 693).
6. Discuss signs, symptoms, and transport management of heat exhaustion (p 693).
7. Discuss signs, symptoms, and transport management of heatstroke (p 694).
8. Discuss signs, symptoms, and transport management of frostbite (p 697).
9. Discuss signs, symptoms, and transport management of hypothermia (p 698).
10. Discuss signs, symptoms, and transport management of drowning (p 699).
11. Discuss signs, symptoms, and transport management of diving injuries (p 699).
12. Explain the purpose of hyperbaric therapy and when it might be used (p 700).
13. Discuss signs, symptoms, and transport management of altitude illness (p 701).
14. List flight considerations relating to environmental emergencies (p 701).

Infectious and Communicable Diseases

1. Describe the types of immunity and the components of humoral and cell-mediated immunity (pp 712, 714).
2. Describe the types of anaphylaxis and the signs, symptoms, and treatment of anaphylaxis (pp 715–716).
3. Discuss the implications of transporting patients with immunodeficiencies (p 716).
4. Discuss the differences between normal, opportunistic, and pathogenic organisms (p

717).

5. Explain the virulence factors found in pathogenic organisms, including how they can spread from bacterial cell to bacterial cell (p 718).
6. Describe the portals of entry for infectious organisms and the process of infection once entry is gained (p 719).
7. Compare the effects of bacterial endotoxins and exotoxins (p 718).
8. Describe viral pathogenesis (p 718).
9. Discuss epidemiology, including reservoirs of infection and transmission of infectious disease (p 721).
10. Discuss the etiologic agents, mode of transmission, signs and symptoms, and treatment of the following:
 - Meningitis (bacterial and viral)
 - Respiratory syncytial virus
 - Necrotizing fasciitis
 - Epiglottitis
 - Tuberculosis
 - Pneumonia

 - Fungal diseases
 - Influenza
 - Various herpesviruses
 - Viral hepatitis
 - Human immunodeficiency virus
 - Rickettsial diseases such as Rocky Mountain spotted fever
 - Severe acute respiratory syndrome
 - *Escherichia coli* O157:H7
 - West Nile virus
 - Methicillin-resistant *Staphylococcus aureus* and vancomycin-resistant *S. aureus*
 - Vancomycin-resistant enterococci (pp 722–726, 728–731, 736–738)
11. Understand acquired immunodeficiency syndrome—defining conditions (p 734).
12. State the recommendations for use of standard precautions in all health care settings (p 739).
13. Understand how the overuse and misuse of antimicrobials leads to resistant infectious organisms (p 743).
14. Explain universal precautions, including situations when they should be used (p 747).
15. Explain isolation, airborne, and droplet precautions, including situations when they should be used (p 747).
16. Discuss the importance of handwashing and use of hand sanitizers and/or hand antiseptics in preventing contamination and transmission of infectious diseases (p 748).
17. Discuss the appropriate and correct use of personal protective devices (both donning and doffing) (p 750).
18. Identify the vaccinations needed for CCTPs and health care workers in general (p 746).
19. Understand decontamination chemicals and techniques appropriate for cleanup after transporting patients harboring various infectious diseases. Include

decontamination of equipment and vehicle surfaces as well as uniforms (clothing and shoes) and personal protective equipment (p 751).

20. Discuss actions to take after blood exposure (p 752).

Toxicologic Emergencies

1. Identify issues that may adversely affect the health and safety of critical care transport professionals during the treatment and transport of patients experiencing a toxicologic emergency (p 768).
2. Describe assessment of and considerations common to all patients following a poisoning or overdose (p 769).
3. Discuss the assessment findings associated with the various toxidromes and medication reaction syndromes encountered in the critical care environment (p 774).
4. Discuss situations in which various means of decontamination are required or indicated following a toxic exposure or overdose (p 776).
5. Identify those chemicals or medications that require enhanced elimination (removal of absorbed toxins) from the body (p 780).
6. Identify the clinical presentation, mechanism of toxicity, and treatment of poisoning or overdose situations involving pharmaceutical and abuse agents (p 780).
7. Identify the clinical presentation, mechanism of toxicity, and treatment of poisoning or overdose situations involving chemical agents (pp 781–790).
8. Recognize especially toxic substances that pose extreme risks to patients and providers (p 790).
9. Discuss hazardous materials response and critical care transport considerations in such incidents (p 798).
10. Discuss radiation emergencies and critical care transport considerations (p 799).

MODULE 8

GI/GU/RENAL MANAGEMENT

Goal:

Participants will integrate assessment findings to formulate a field impression and implement or continue a comprehensive treatment plan for a critical patient suffering from genitourinary, gastrointestinal, or renal complications.

Objectives:

After completion of this module, the student will be able to:

1. Describe the anatomy and physiology of the gastrointestinal system, including the alimentary canal and accessory organs (p 607).
2. Describe the anatomy and physiology of the genitourinary system, including the urinary system and the male and female reproductive systems (p 610).
3. Differentiate between upper and lower gastrointestinal bleeding (pp 615, 618).
4. Describe the pathologies related to common disorders of the gastrointestinal system,

- including peptic ulcers, gastritis, esophageal varices, Mallory-Weiss syndrome, diverticulitis, angiodysplasia, appendicitis, inflammatory bowel disease, ulcerative colitis, and Crohn disease (pp 615–619).
5. Assess the signs and symptoms of the various gastrointestinal conditions (pp 620, 627).
 6. Describe laboratory results as they relate to specific gastrointestinal system disorders (pp 622, 627).
 7. Describe the management of the various gastrointestinal conditions (pp 623, 628).
 8. Describe gastrointestinal system imaging, including endoscopy, colonoscopy, angiography, and scintigraphy, as well as other in-hospital assessment and management techniques (p 622).
 9. Describe the pathologies related to diseases of the gastrointestinal system, including intestinal obstructions, ileus, liver disease, choledocholithiasis, and pancreatitis (pp 625–638).
 10. Describe the pathologies related to common disorders of the genitourinary system, including acute kidney injury, chronic kidney disease, urinary tract infections, testicular torsion, penile fracture, and priapism (pp 638–643).
 11. Assess the signs and symptoms of the various genitourinary pathologies (pp 639, 641).
 12. Describe the management of the various genitourinary pathologies (pp 639, 641).
 13. Describe genitourinary system laboratory results as they relate to the specific disorders (pp 639–641).
 14. Describe various gastrointestinal- and genitourinary-related feeding and drainage tubes, including their assessment, maintenance, and potential complications (p 643).
 15. Discuss flight considerations for patients with feeding or drainage tubes (p 650).
 16. Explain acid-base physiology (p 650).
 17. Examine how the body's chemical buffer system mitigates acid-base imbalances (p 651).
 18. Describe how to interpret blood gas samples (p 652).
 19. Describe the pathologies related to acid-base imbalances, their clinical features, and their treatment (p 654).
 20. Discuss flight considerations for patients with gastrointestinal and genitourinary tract complications (p 655).

MODULE 9

SPECIAL PATIENT CONSIDERATIONS

Goal:

The student will be able integrate assessment findings to formulate a field impression and implement or continue a comprehensive treatment plan for normal and complicated pregnancies, assess and manage neonatal emergencies, and address the needs of bariatric patient encounters. Finally, students will be

able to integrate pathophysiological principles and assessment findings to manage, treat, and transport the critical care pediatric patient with multi-system trauma, end-stage disease presentation, acute presentations of chronic conditions and single or multi-disease etiologies.

Objective:

After completion of this module, the student will be able to:

1. Discuss the anatomy of the female reproductive system (p 809).
2. Recognize the physiologic changes during pregnancy (p 810).
3. Describe the changes that occur in the cardiovascular, respiratory, gastrointestinal, renal, and endocrine systems during pregnancy (p 810).
4. Discuss dermatologic changes that occur during pregnancy (p 813).
5. Discuss special areas of concern when performing a critical care transport of a pregnant patient (p 813).
6. Describe the management of the pregnant patient who is in cardiac arrest (p 813).
7. Discuss potential maternal cardiovascular complications exacerbated or induced by pregnancy (p 813).
8. Discuss fetal oxygenation and heart rate, including conditions associated with fetal distress during labor (p 814).
9. Discuss how to assess a fetus during a critical care transport (p 815).
10. Describe several methods of fetal monitoring during critical care transport of a pregnant patient, including electronic fetal monitoring (p 816).
11. Explain how to use a Doppler device (p 816).
12. Describe the complications of pregnancy, including spontaneous abortion, ectopic pregnancy, and causes of bleeding (pp 821–824).
13. Discuss the signs and symptoms and treatment of abruptio placenta, placenta previa, and uterine rupture (pp 823, 824).
14. Discuss medical conditions that can exist during pregnancy, including hypertension complicating pregnancy, preeclampsia, eclampsia, and HELLP syndrome (pp 824–826).
15. Explain how to manage medical conditions that can exist during pregnancy, including hypertension complicating pregnancy, preeclampsia, eclampsia, and HELLP syndrome, during critical care transport (pp 824–826).
16. Explain the concerns regarding preterm labor and premature delivery (p 826).
17. Discuss the use of tocolytic agents to interrupt labor (p 827).
18. Recognize fetal malpresentations of delivery, including frank breech, complete breech, incomplete breech, footling breech, and umbilical cord prolapse (pp 828–830).
19. Discuss how to manage fetal malpresentations during a critical care transport (p 828).
20. Describe shoulder dystocia (p 831).
21. Explain how to manage shoulder dystocia during a critical care transport (p 831).
22. Discuss multiple-birth deliveries (p 832).
23. Explain how to manage multiple-birth deliveries during a critical care transport (p 832).
24. Discuss postpartum care of the mother and infant during a critical care transport (p 832).
25. Describe potential postpartum complications and their management during critical

care transport, including postpartum hemorrhage and amniotic fluid embolism (p 832).

26. Recognize gynecologic issues and emergencies, including pelvic inflammatory disease, toxic shock syndrome, ovarian cysts, pathologic cysts, ovarian torsion, and gynecologic trauma (pp 834–836).

27. Discuss how to manage gynecologic emergencies, including pelvic inflammatory disease, toxic shock syndrome, ovarian cysts, pathologic cysts, ovarian torsion, and gynecologic trauma, during critical care transport (pp 834, 835, 836).

1. Define the terms *newborn*, *neonate*, and *term newborn* (p 844).
2. Discuss the roles of the CCTP when caring for a neonate (p 844).
3. Recognize anatomy and physiology unique to a neonate, including differences in thermoregulation, respiratory structure and function, oxygen transport, cardiovascular function, renal function, fluid and electrolyte balance, central nervous system, and skeletal system (pp 844–847).
4. Understand how problems with transitional circulation can result in neonatal emergencies (p 846).
5. Describe developmental aspects of pain in the neonate (p 847).
6. Discuss anatomic and physiologic differences in the premature infant, including how these relate to management (p 847).
7. Discuss medical complications for which late preterm infants are at risk (p 847).
8. Identify important antepartum and intrapartum risk factors that can affect labor, delivery, and the neonate (p 848).
9. Understand the pathophysiology that is associated with antepartum and intrapartum factors that can affect labor, delivery, and the neonate (p 848).
10. Identify when a CCTP would use the Apgar score in caring for a newborn (p 848).
11. Discuss neonatal assessment, stabilization, and management (p 848).
12. Discuss how to prepare for and provide neonatal resuscitation (p 848).
13. Identify situations in which neonatal resuscitation should be performed (p 848).
14. Describe the appropriate assessment technique when examining a neonate (p 848).
15. Explain the initial steps in resuscitation of a neonate (p 849).
16. Describe methods that can be used to improve airway and breathing in a neonate with inadequate respiration (p 850).
17. Describe free-flow oxygen delivery (p 850).
18. Explain the appropriate assisted ventilation for a neonate (p 850).
19. Describe the appropriate endotracheal intubation technique for a neonate (p 855).
20. Identify when an orogastric tube should be inserted in a neonate (p 856).
21. Describe the procedure for inserting an orogastric tube in a neonate (p 856).
22. Describe the appropriate chest compression and ventilation technique for a neonate (p 857).
23. Discuss indications for medications, dosages, and routes of administration for a neonate (p 857).
24. Discuss the use of ventilators during neonatal transports (p 861).
25. Discuss the pathophysiology, assessment findings, management, and treatment plan for the following respiratory emergencies in a neonate: apnea, meconium aspiration,

- pneumonia, respiratory distress syndrome, pneumothorax, and respiratory acidosis (pp 861–864).
26. Distinguish between primary and secondary apnea (p 862).
 27. Discuss the causes, assessment, and management of primary and secondary apnea (p 862).
 28. Describe how to perform needle thoracentesis for pneumothorax decompression in a neonate (p 863).
 29. Determine when vascular access is indicated for a neonate (p 866).
 30. Recognize congenital anomalies that may lead to compromise of the neonate (p 869).
 31. Discuss the pathophysiology, assessment findings, and management of the following cardiovascular emergencies in a neonate: cyanosis, cyanotic congenital heart disease, tachyarrhythmias, bradyarrhythmias, cardiac arrest, persistent pulmonary hypertension, shock, and anemia (pp 865–869).
 32. Describe how to perform umbilical vein catheterization in a neonate (p 868).
 33. Discuss the pathophysiology, assessment findings, and management of the following gastrointestinal emergencies in a neonate: gastroschisis, omphalocele, gastrointestinal obstruction and vomiting, acute intestinal perforation, hematemesis and bleeding from the rectum, volvulus, intussusception, and diarrhea (pp 869–873).
 34. Explain appropriate fluid selection when vascular access is indicated for a neonate (p 870).
 35. Discuss the management of infectious diseases and sepsis in the neonate (p 873).
 36. Discuss the management of hyperthermia and hypothermia in the neonate (p 873).
 37. Discuss the management of toxic exposure in the neonate, including the appropriate treatment for the neonate with narcotic depression (p 873).
 38. Discuss the pathophysiology, assessment findings, and management of the following trauma/birth injuries in the neonate: head and neck injuries, nerve injuries, bone injuries, and abuse/maltreatment (p 874).
 39. Discuss the pathophysiology, assessment findings, and management of the following neurologic conditions in the neonate: seizures, hypoxic ischemic encephalopathy, and lethargy (p 875).
 40. Discuss the pathophysiology, assessment findings, and management of the following metabolic conditions in the neonate: metabolic acidosis, hypoglycemia, hypocalcemia, and inborn errors of metabolism (p 876).
 41. Discuss the use of an incubator (p 877).
 42. Recognize the emotional impact of a neonate’s illness or injury, and the need for information, empathy, and compassion for the parent/guardian during a critical care transport (p 878).
 43. Discuss risks associated with critical care transport, including factors unique to air transport of a neonate (p 879).
1. Explain the anatomic and physiologic differences between adult and pediatric patients (p 887).
 2. Explain the physical and psychosocial growth and development of children (p 890).
 3. Outline the differences in the general approach to critical care transport patient assessment of adult and pediatric patients (p 891).

4. Discuss the indications, dosage, and route of administration for medication administration in pediatric patients in the critical care transport environment (p 893).
5. Describe which special pediatric equipment may be needed in a critical care transport (p 899).
6. Discuss interfacility transport considerations relating to pediatric critical care transport (p 899).
7. Explain considerations when parents and caregivers accompany pediatric patients during a transport (p 900).
8. Explain some of the common medical emergencies in the pediatric population, including the assessment and management in the critical care transport environment (pp 901–908).
9. Explain common pediatric trauma emergencies, including the assessment and management in the critical care transport environment (pp 908–921).
10. Explain critical care transport management of a pediatric patient with suspected abuse or neglect (p 921).
11. Explain critical care transport management of a pediatric patient with hypothermia (p 922).
12. Explain critical care transport management of a pediatric drowning patient (p 922).
1. Describe the five major types of bariatric surgery, including potential complications from those procedures (p 933).
2. Discuss considerations related to oxygen consumption in bariatric surgery patients (p 935).
3. Describe safe methods of moving bariatric surgery patients from the facility to the stretcher, and vice versa, and of moving the stretcher to and from the ambulance (p 937).
4. Discuss excited delirium syndrome, including its risk factors, pathophysiology, signs and symptoms, and treatment (p 938).
5. Explain reimbursement issues related to bariatric-specialty units (p 939).
6. Discuss the elements of interfacility transport monitoring of patients with excited delirium syndrome (p 942).
7. Describe the unique considerations that arise with the critical care transport of pediatric patients with special needs, including children with congenital heart disease; hematology–oncology pediatric patients; pediatric patients with venous access devices; and pediatric patients with respiratory, neurologic, and gastrointestinal disorders (pp 943–951).

MODULE 10

HEMODYNAMIC MONITORING:

Goal:

Student will be able to interpret hemodynamic parameters and recognize the treatment of life-threatening conditions. This session will also incorporate instruction on the management of balloon pumps.

Objectives:

At the completion of the Module, the student will be able to discuss:

1. Describe cardiovascular anatomy and physiology, including the phases of the cardiac cycle (p 538).
2. Discuss the principles of and indications for invasive hemodynamic monitoring (p 539).
3. Interpret hemodynamic values (p 541).
4. Discuss the indications, contraindications, and complications for arterial lines (pp 545–551).
5. Discuss indications, contraindications, and complications for central venous lines (p 551).
6. Describe the significance of each pressure reading used in patient management (p 563).
7. Describe the indications, contraindications, and complications for intra-aortic balloon pump therapy (p 568).
8. Discuss the indications, contraindications, and complications for other cardiac-assist devices, including:
 - Continuous-flow pumps
 - Extracorporeal membrane oxygenation
 - Ventricular-assist devices
 - Total artificial heart (pp 582–588)
9. Describe general transport considerations and troubleshooting procedures for common problems with invasive hemodynamic monitoring and cardiac-assist devices during transport (p 588).
10. Discuss flight considerations related to invasive hemodynamic monitoring and cardiac-assist devices (p 593).

MODULE 11

CLINICAL CASE INTEGRATION

Goal:

At the end of this class The learner will be able to demonstrate appropriate management of simulated critical patient(s) using comprehensive assessment techniques, effective communication, exhibit exemplary professional behavior, and perform advanced interventions as part of a treatment plan to mitigate improved patient care outcomes during an interfacility transfer.

Objectives:

At the conclusion of this module, the participant will be able to synthesize the following knowledge and skills into a simulated patient encounter:

- 12.1 Demonstrate advanced airway and ventilation management
 - Oral and nasal Intubations
 - Combitube
 - LMA
 - RSI
 - Ventilator therapy
 - ETCO2 monitoring
- 12.2 Demonstrate proficiency with equipment
 - Invasive monitoring (Swan-Ganz, CVP, arterial line)
 - Cardiac monitoring (12 lead EKG's, fax transmission)
 - Pacing (Transvenous and transcutaneous)
 - IVAC Mini-med pumps
- 12.3 Demonstrate advanced surgical intervention
 - Cricothyrotomy (needle/surgical)
 - Chest tube insertion (Cook Catheter)
 - Arterial line insertion with pressure monitoring
- 12.4 Demonstrate an understanding of any and all medications routinely encountered in the critical care environment. This will include
 - Routes of administration
 - Indication and contraindication
 - Side effects
 - Dosages and Drug calculations

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Patient Confidentiality Agreement

Given the nature of EMS, it is imperative that we maintain the confidentiality of patient information that we receive during the job. Princeton Rescue Squad (PRS) prohibits the release of any patient information to anyone outside PRS unless required for the purpose of treatment, payment, or healthcare operations and discussions of Protected Health Information (PHI) within PRS should be limited. Acceptable uses of PHI within PRS include, but are not limited to, exchange of patient information needed for treatment of the patient, billing, and other essential healthcare operations, per review, internal audits, and quality assurance activities

I understand that Princeton Rescue Squad provides services to patients that are private and confidential. I also understand that as a participant in the Princeton Rescue Squad Education Program I must respect and protect the privacy of all patients. I understand that it is necessary in the rendering of services, that patients provide personal information and that such information may exist in a variety of forms such as electronic, oral or written. I also understand that all such information is strictly confidential and protected by federal and state laws.

I agree that I will respect and protect the privacy of all patients that I may have contact with while participating in the Education Program. If at any time, I knowingly or inadvertently breach the confidentiality of a patient I will notify Princeton Rescue Squad's Privacy Officer immediately. I also understand that a breach of patient confidentiality may result in criminal or civil actions being filed against me.

(Print Student Name)

(Student Signature)

Date

STATEMENT OF STUDENT'S RESPONSIBILITY

I have received a copy of the CCT Syllabus & Student Handbook providing required Policies and Procedures related to Princeton Rescue Squad's CCT Course. I have read the policies and I fully understand the information contained therein. I acknowledge that this information packet contains policies, regulations, and procedures established to meet the overall education of the CCT Student. Princeton Rescue Squad reserves the right to make changes at any to time to reflect any state or federal policies and regulation that may affect the implementation of the CCT Education Program.

Specifically, I understand the following:

1. Successful completion of Princeton Rescue Squad's CCT Education Program does not guarantee a West Virginia certification.
2. I must maintain an overall grade point average of 76 percent or higher to be eligible to take the WVOEMS CCT Certification Exam.
3. I will not be eligible to begin clinical rotations until I have submitted proof of required immunizations.
4. I understand that a random drug-screening test may be asked for at any time during clinical rotations.
5. I understand that failure of a random drug screening test during clinical rotation, or the refusal to take the random drug screening test may result in dismissal from the CCT Educational Program at Princeton Rescue Squad.
6. I understand that the purpose of this program is to prepare me to be eligible to take the exam administered by the WVOEMS. Upon successfully passing the certification exam, I must complete the application process through the West Virginia Offices of Emergency Medical Services or any intended state you plan to work in for certification/licensure as an EMS provider.
7. I understand if I choose to take the WVOEMS Exam I am responsible for the payment of any WVOEMS mandated fee(s).
8. I understand that it is my responsibility to read the required reading assignments, complete the required homework and skills assignments to learn the information and become proficient in all skills.
9. I understand that I must meet all financial obligations to Princeton Rescue Squad or I will be placed in default and restricted from taking the State WVOEMS or NREMT certification exam until such time as my account is paid in full.

By signing below, I am signifying that I have received, read, and understood the above and I agree to abide by these rules while a student in the Princeton Rescue Squad's CCT Education Program.

Print Name Here

Sign Name Here

Date