



**COWLEY COLLEGE
& Area Vocational Technical School**

COURSE PROCEDURE FOR

**Critical Care Emergency Medical Transport ProgramSM
EMS5656 6 Credit Hours**

Student Level:

This course is open to students on the college level in either the freshman or sophomore year.

Catalog Description:

EMS5656 - CRITICAL CARE EMERGENCY MEDICAL TRANSPORT PROGRAMSM (6 hrs)

This course is designed to prepare paramedics and nurses to function as members of a critical care transport team. Critical patients requiring transport between facilities need a different level of care from hospital or emergency field patients. Upon completion of the course, the student will gain an understanding of the special needs of critical patients during transport, become familiar with the purpose and mechanisms of hospital procedures and equipment, and develop the skills to maintain the stability of hospital equipment and procedures during transport.

Prerequisite:

Departmental approval.

Controlling Purpose:

The Critical Care Emergency Medical Transport ProgramSM is designed to prepare paramedics and nurses to function as members of a critical care transport team. Critical patients requiring transport between facilities need a different level of care from hospital or emergency field patients.

Learner Outcomes:

Upon completion of the course, the student will gain an understanding of the special needs of critical patients during transport, become familiar with the purpose and mechanisms of hospital procedures and equipment, and develop the skills to maintain the stability of hospital equipment and procedures during transport.

Units Outcomes and Criterion Based Evaluation Key for Core Content:

The following defines the minimum core content not including the final examination period. Instructors may add other content as time allows.

Evaluation Key:

- A = All major and minor goals have been achieved and the achievement level is considerably above the minimum required for doing more advanced work in the same field.
- B = All major goals have been achieved, but the student has failed to achieve some of the less important goals. However, the student has progressed to the point where the goals of work at the next level can be easily achieved.

- C = All major goals have been achieved, but many of the minor goals have not been achieved. In this grade range, the minimum level of proficiency represents a person who has achieved the major goals to the minimum amount of preparation necessary for taking more advanced work in the same field, but without any major handicap of inadequacy in his background.
- D = A few of the major goals have been achieved, but the student's achievement is so limited that he is not well prepared to work at a more advanced level in the same field.
- F = Failing, will be computed in GPA and hours attempted.
- N = No instruction or training in this area.

UNIT 1: THE CRITICAL CARE ENVIRONMENT						
Outcomes:						
A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Describe the history of ambulance transports.
						Name three examples of Critical Care Transport Team composition configuration.
						Identify and describe the preferred qualifications of a Critical Care Transport Paramedic.
						Name six advanced procedures performed by a Critical Care Transport Team.
						Differentiate between routine and specialty equipment found on a Critical Care Transport unit.
						Discuss the three modes of transport for the critically ill or injured.
						Identify indications for critical care transport.
						Describe the interfacility transfer process.
						Apply the essential legal principles necessary to the practice of emergency medicine to the job of the critical care paramedic.
						Recognize and discuss the legal risks and liabilities involved in critical care transportation.
						Apply basic risk management principles to critical care transport.
						Discuss the fundamental elements of litigation, hearings and peer-review proceedings.
						Understand EMTALA and the implications for EMS.
						State the appropriate steps for accepting a patient transfer.
						State the appropriate steps in assessing and preparing for transfer.
						State CCEMT-P responsibilities during transfer.
						State the role of other health care providers who accompany the patient.
						State the appropriate steps to transfer care to the receiving facility.

						Appropriately document the transfer.
						Identify areas of potential liability.
						State methods to minimize risk.
						Discuss current case law regarding transport.
						Describe the relationship between laboratory medicine and the diagnosis and treatment of patients.
						Describe the common problems associated with specimen collection and ways to avoid these problems.
						Identify mean lab values and deviations for the complete blood count, the differential blood count, and platelet values.
						Interpret arterial blood gas data.
						Interpret chemistry studies.
						Interpret urinalysis.
						Describe the purpose of culture and sensitivity tests.
						Interpret miscellaneous lab studies.
						Define shock.
						Discuss the major pathophysiologies of shock.
						Describe how assessment techniques can help identify shock.
						Describe the general management principles for the patient in shock.
						Describe pharmacological intervention in different types of shock.
						Define multisystem organ failure.
						List the history, signs, and symptoms of the patient with sepsis.
						Describe the management of the patient with sepsis.
						List the history, signs, and symptoms of the patient with acute respiratory distress syndrome (ARDS).
						Describe the management of the patient with ARDS.
						List the history, signs, and symptoms of the patient with disseminated intravascular coagulation (DIC).
						Describe the management of the patient with the management of the patient with DIC.
						Describe proper infection control procedures that the Critical Care Transport Paramedic should take when treating patients.
						Identify the mode of transmission and precautions to follow when treating a patient with HIV, Hepatitis, Multiple-Antibiotic Resistant Bacteria, Tuberculosis and Meningitis.

UNIT 2: BREATHING MANAGEMENT

Outcomes:

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Assess oxygen saturation using a pulse oximeter.
						Assess carbon dioxide levels using an end tidal CO ₂ detector.
						Identify the categories of information obtained through an ABG analysis. Describe the technique for drawing an ABG.
						Describe important landmarks and anatomical structures of the chest wall and respiratory system.
						Describe two factors important in the generation of breath sounds.
						Describe how to assess breath sounds for duration, pitch, and intensity.
						Identify auscultatory sites for breath sounds assessment.
						Define normal and adventitious breath sounds.
						Define consolidation.
						Perform vocal and tactile fremitus assessments of lung fields.
						Define and describe abnormal respiratory patterns.
						Define and describe respiration and ventilation abnormalities.
						Perform a complete respiratory assessment.
						Identify indications for pleural decompression.
						Discuss methods for pleural decompression assessment.
						Describe the procedure for pleural decompression.
						Differentiate between normal and abnormal assessment findings.
						Identify transport complications associated with pleural decompression.
						Identify indications and purpose for chest tubes.
						Discuss methods for chest tube assessment.
						Differentiate between normal and abnormal assessment findings.
						Describe the procedure for chest tube placement.
						Identify transport complications for chest tubes.
						Identify indications and purpose for portable ventilators.
						Discuss methods for ventilator assessment.
						Differentiate between normal and abnormal assessment findings.
						Describe the procedure for placing a patient on a portable ventilator.
						Identify transport complications of portable ventilators.
						Identify indications for ET tube and tracheal suctioning.

							Describe the procedure for ET tube and tracheal suctioning.
							Identify complications of ET tube and tracheal suctioning.
							Identify indications and purpose for rapid sequence induction (RSI).
							Identify pharmacologic agents utilized in RSI.
							Describe why sedative medications should usually accompany the use of paralytic agents.
							Outline the technique for RSI.
							Identify transport considerations for patients intubated with the RSI technique.

UNIT 3: SURGICAL AIRWAY MANAGEMENT
Outcomes:

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Identify indications and purposes for a tracheostomy.
						Identify criteria for assessment.
						Differentiate between normal and abnormal tracheostomy assessment findings.
						Describe the procedure for tracheostomy placement.
						Identify transport complications of tracheostomies.
						Identify indications and purpose for needle cricothyrotomy.
						Identify criteria for needle cricothyrotomy assessment.
						Describe the procedure for needle cricothyrotomy.
						Differentiate between normal and abnormal needle cricothyrotomy assessment findings.
						Identify transport complications for needle cricothyrotomy.
						Identify indications and purpose for surgical cricothyrotomy.
						Identify criteria for surgical cricothyrotomy assessment.
						Describe the procedure for surgical cricothyrotomy.
						Differentiate between normal and abnormal surgical cricothyrotomy assessment findings.
						Identify transport complications for surgical cricothyrotomy.
						Discuss the indications and purpose for retrograde intubation.
						Identify criteria for retrograde intubation.
						Describe the procedure for retrograde intubation.
						Differentiate between normal and abnormal retrograde intubation assessment

						findings.
						Identify transport complications for retrograde intubation.

UNIT 4: HEMODYNAMIC MANAGEMENT
Outcomes:

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Differentiate between types of invasive lines
						Identify indications for invasive lines.
						Discuss methods for assessing invasive lines.
						Differentiate between normal and abnormal invasive line assessment findings.
						Identify transport complications of invasive lines.
						Identify hemodynamic monitor controls.
						Interpret hemodynamic readings.
						Identify alarm indications.
						Identify transport complications of hemodynamic monitors.
						Define preload, afterload, contractility, systemic vascular resistance, cardiac output and cardiac index.
						Discuss alarm troubleshooting procedures.
						List two purposes for invasive hemodynamic monitoring.
						Identify the function of each component of a PA catheter including length markings, balloon inflation port, thermistor port, PA distal port, RA proximal port, and auxiliary RA port.
						List normal hemodynamic pressures and identify normal pressure waveforms for the RA, RV, PA, PCWP, LA and peripheral arterial sites.
						Interpret SVO2 monitoring data and discuss appropriate therapeutic modalities to treat abnormal values.
						Discuss indications of measuring cardiac output and cardiac index.
						Describe problems commonly encountered in measuring PA pressures and state appropriate interventions.
						List at least 5 potential complications associated with PA insertion.
						Differentiate between antigens, natural antibodies and acquired antibodies.
						Identify antibodies and antigens associated with specific blood types.
						Define Rh factor.
						Identify seven types of blood component therapy.

						Identify indications for blood administration.
						Describe the procedure for blood administration.
						Identify the signs and symptoms of transfusion reactions.
						Describe the management procedures for transfusion reactions.
						Describe the indications for administration of whole blood and packed red blood cells.
						Describe the indications for typing, screening and cross matching blood.
						Describe the ABO system for matching blood.
						Describe the characteristics of blood products.
						Describe the procedure for administration of whole blood or packed red blood cells.

UNIT 5: CARDIAC MANAGEMENT

Outcomes:

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Describe the difference between monitoring and assessing a patient using an ECG machine.
						Demonstrate proper lead placement for a 12 Lead ECG.
						Using a simple chart and leads I,II,and III, determine the electrical axis and the presence of fascicular blocks (hemiblocks).
						Using lead V1 (MCL1), determine bundle branch blocks.
						Describe the clinical significance of hemiblocks and bundle branch blocks in the cardiac patient.
						Describe the strategy for identifying ventricular tachycardia in wide complex tachycardia.
						On a 12-Lead or Multi-Lead ECG, identify ST and T wave changes relative to myocardial ischemia, injury and infarction.
						Describe a systematic "assessment" of a 12-Lead ECG.
						Describe possible complications of various infarct locations.
						Discuss the incidence of sudden cardiac death and the population at risk.
						Describe how an Implantable Cardioverter Defibrillator (ICD) works, its components and its functions.
						Identify the potential complications associated with the ICD and location of placement in the chest wall.
						Describe the procedure for deactivating an ICD with a magnet.

						Understand the basic concepts underlying cardiac pacemaker technology.
						Understand the current code system used for cardiac pacing.
						Understand and troubleshoot the potential rhythms that indicate forms of pacemaker malfunctions.
						Identify indications for Intra-aortic Balloon Pump (IABP).
						Define the primary physiological effects achieved by the inflation and deflation of the IAB.
						Describe the set up and operation of an IABP.
						Discuss the hemodynamic effects of proper balloon inflation and deflation.
						Identify the factors that affect diastolic augmentation and appropriate troubleshooting considerations.
						Identify proper timing and appropriate corrective action.
						Identify transport complications of IABP.

UNIT 6: PHARMACOLOGICAL MANAGEMENT

Outcomes:

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Identify the indications, mechanism of action, pharmacokinetics, dosing and side effects of haloperidol.
						Identify the mechanism of action of benzodiazepine drugs.
						Compare the dosing and side effects of diazepam, lorazepam and midazolam.
						Identify the indications, mechanism of action, pharmacokinetics, dosing and side effects of flumazenil.
						Identify the indications, mechanism of action, pharmacokinetics, dosing, side effects, drug interactions and administration considerations of propofol.
						Identify the mechanism of action, pharmacokinetics, and side effects of morphine.
						Identify the mechanism of action, pharmacokinetics, and side effects of naloxone.
						Identify the mechanism of action, pharmacokinetics, and toxicity of succinylcholine.
						Identify the indications, mechanism of action, pharmacokinetics, side effects and drug interactions of pancuronium, vecuronium and atracurium.
						Identify the order of paralysis.
						Discuss the adverse effects of prolonged paralysis.
						Identify the role of "train of four" monitoring when using paralytics.

					Compare the mechanism of action, dosing, pharmacokinetics, and adverse effects of captopril, nifedipine and clonidine.
					Identify the mechanism of action, pharmacokinetics, dosing, toxicity and administration considerations of nitroprusside.
					Identify the mechanism of action, pharmacokinetics, dosing and adverse effects of labetalol.
					Identify the pharmacology, pharmacokinetics, dosing and toxicity of diazoxide.
					Compare the advantages and disadvantages of crystalloids and colloids.
					Compare the use, dose and adverse effects of albumin, plasma protein fraction, Hetastarch and Dextran.
					Identify the indications for vasopressors.
					Compare the effects, dosing and adverse effects of dopamine, epinephrine, norepinephrine (Levophed), phenylephrine and dobutamine.
					Identify the pharmacology and effects of beta receptor stimulation for beta agonists.
					Compare the pharmacokinetics, dosing, delivery, and adverse effects of albuterol, epinephrine and terbutaline.
					Identify the pharmacology, metabolism, adverse effects, drug interaction and dosing of metoproterenol and theophylline.
					Identify the pharmacology and dosing of anticholinergics.
					Compare and contrast anticholinergics and beta agonists.
					Identify the pharmacology and uses of magnesium.
					Identify the mechanism of action, ECG effects, uses, pharmacokinetics, dosing and toxicity of Class IA antiarrhythmic drugs.
					Identify the mechanism of action, ECG effects, uses, pharmacokinetics, dosing and toxicity of Class IB antiarrhythmic drugs.
					Identify the mechanism of action, ECG effects, and uses of Class IC antiarrhythmic drugs.
					Identify the mechanism of action, ECG effects, and uses of Class II antiarrhythmic drugs.
					Identify the mechanism of action, ECG effects, uses, pharmacokinetics, adverse effects and drug interactions of Class III antiarrhythmic drugs.
					Identify the mechanism of action, ECG effects, and uses of Class IV antiarrhythmic drugs.
					Compare the pharmacokinetics, dosing and adverse effects of verapamil and diltiazem.
					Identify the mechanism of action, ECG effects, uses, pharmacokinetics, administration considerations, drug interactions and toxicity of adenosine.
					Identify the pharmacology, dosage forms, pharmacokinetics, administration

						considerations, adverse effects, and tolerance considerations of nitrates.
						Identify the uses, side effects and patient selection criteria for beta blockers.
						Identify the uses, contraindications, and side effects of calcium channel blockers.
						Identify the absolute and relative contraindications to thrombolytic therapy.
						Compare the pharmacology, pharmacokinetics, dosing and adverse effects of TPA, streptokinase and APSAC.
						Discuss the benefits of thrombolytic therapy.
						Identify the mechanism of action, dosing, and clinical trial findings of aspirin as an anticoagulant.
						Identify the mechanism of action, dosing, monitoring parameters, adverse effects and clinical trial results of heparin.
						Identify the pharmacology, indications, monitoring parameters, drug interactions and adverse effects of warfarin.
						Identify the pharmacology and uses of antibiotics.
						Identify the indications, mechanism of action, pharmacokinetics, and side effects of etomidate.

UNIT 7: GASTROINTESTINAL, GENITOURINARY AND RENAL MANAGEMENT

Outcomes:

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Identify GI/GU assessment criteria.
						Differentiate between normal and abnormal GI/GU assessment findings.
						Identify the indications for a nasogastric and orogastric tube.
						Discuss methods for nasogastric and orogastric assessment.
						Differentiate between normal and abnormal NG/OG assessment findings.
						Describe procedure for placement of nasogastric and orogastric tubes.
						Identify transport complications associated with nasogastric and orogastric tubes.
						Identify indications and purpose for Foley catheters.
						Discuss assessment methods for Foley catheters.
						Differentiate between normal and abnormal Foley catheter assessment findings.
						Describe procedure for Foley catheter placement.
						Identify transport complications for Foley catheters.

						Identify indications for an ostomy,
						Discuss methods for ostomy assessment.
						Differentiate between normal and abnormal ostomy assessment findings.
						Discuss methods for ostomy placement.
						Identify transport complications for ostomies.
						Identify indications and purpose for dialysis.
						Differentiate between hemodialysis and peritoneal dialysis.
						Describe the procedure for accessing arteriovenous shunts.
						Identify transport complications of dialysis patients.
						Describe the rectal anatomy and structures.
						Classify rectal bleeding: red, bright red, melena.
						Discuss incontinence, diarrhea and constipation management techniques.
						Demonstrate rectal temperature assessment technique.
						Describe decubitus ulcers.

UNIT 8: NEUROLOGICAL MANAGEMENT

Outcomes:

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Describe the major components of a neurological examination.
						Describe the differences in the neurological assessment between a brain injured or spinal injured patient.
						Perform a neurological examination.
						Describe the findings of a normal and abnormal neurological examination.
						Describe vital signs changes noted with neurological injuries.
						Identify transportation considerations for patients with neurological injuries.
						Correctly perform a neurological assessment.
						Document the findings of a neurological examination.
						Describe intracranial pressure (ICP).
						Describe the pathophysiology of ICP.
						Define compliance.
						Explain herniation of the brain.
						Describe how to calculate cerebral perfusion pressure (CPP).
						Identify signs and symptoms of increasing ICP.
						Identify factors that will increase ICP.

						Identify consequences of increased ICP on patient outcome.
						Identify strategies and methods for decreasing ICP during critical care transport.
						Describe the reasons for ICP monitoring.
						Differentiate between normal and abnormal findings with ICP monitoring.
						Describe the advantages, disadvantages, and transport considerations for the following ICP monitoring devices: Intraventricular catheter, epidural catheter, subdural/ subarachnoid monitoring devices, and fiber optic transducer tipped probe.
						Describe ICP waveform.
						Explain therapies to manage ICP.

UNIT 9: COMPLICATIONS OF TRANSPORT

Outcomes:

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Differentiate operational aspects of critical care transport and conventional prehospital care.
						Identify four major opportunities for positive interaction that exist during a critical care transport.
						Incorporate prospective medical control into the care of critical patients.
						Identify critical decision points in a transport event.
						Develop an event flowsheet.
						Identify essential patient perceptions of quality service.
						Understand the role of family members in critical care transport.
						Recognize situations warranting diversion or interception.
						Incorporate unique management tactics with moribund patients and families.
						Define Boyle's Law.
						Name the eight stressors of flight.
						Name and describe three types of barotraumas.
						Explain how an unpressurized medical cabin can affect equipment.
						Explain "time of useful consciousness".
						List the objective signs and symptoms of hypoxia.
						List the subjective signs and symptoms of hypoxia.
						Name six special considerations that should be taken with patients being air transported.

						Explain how a negative G-force affects the body.
						Define Dalton's law.
						Name three considerations in preventing hearing loss.
						List four contributing factors to crew member fatigue.

UNIT 10: SPECIAL CONSIDERATIONS

Outcomes:

A	B	C	D	F	N	Specific Competencies
						Demonstrate the ability to:
						Identify various histories and general principles for pediatric assessment.
						Define the primary cause of cardiac arrest and list several risk factors.
						Describe principles of general treatment before and during the transport of a pediatric patient.
						Identify various histories and general principles for OB/GYN assessment.
						Describe principles of general treatment before and during the transport of a OB/GYN patient
						Identify and describe burn types, depth and estimate Body Surface Area according to Rule-of-Nines, "palm" scale and age appropriate guidelines.
						Identify principles and methods of burn treatment, analgesia, airway care and patient packaging for transport.
						Utilize American Burn Association categorizing for minor, moderate and severe burns.
						Describe the importance of maintaining fluid volume and body temperature.
						Describe methods to assure adequate fluid volume and body temp, describe theory and practice methods of pharmacologic therapy in burns.

Projects Required:

Varies, refer to syllabus.

Textbook:

Contact Bookstore for current textbook.

Materials/Equipment Required:

Varies, refer to syllabus.

Attendance Policy:

Students should adhere to the attendance policy outlined by the instructor in the course syllabus.

Grading Policy:

The grading policy will be outlined by the instructor in the course syllabus.

Maximum class size:

Based on classroom occupancy

Course Timeframe:

The U.S. Department of Education, Higher Learning Commission and the Kansas Board of Regents define credit hour and have specific regulations that the college must follow when developing, teaching and assessing the educational aspects of the college. A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally-established equivalency that reasonably approximates not less than one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work for approximately fifteen weeks for one semester hour of credit or an equivalent amount of work over a different amount of time. The number of semester hours of credit allowed for each distance education or blended hybrid courses shall be assigned by the college based on the amount of time needed to achieve the same course outcomes in a purely face-to-face format.

Refer to the following policies:

[402.00 Academic Code of Conduct](#)

[263.00 Student Appeal of Course Grades](#)

[403.00 Student Code of Conduct](#)

Disability Services Program:

Cowley College, in recognition of state and federal laws, will accommodate a student with a documented disability. If a student has a disability which may impact work in this class which requires accommodations, contact the Disability Services Coordinator.