National Registry Advanced Emergency Medical Technician Examination Specifications

About the Advanced Emergency Medical Technician Examination Specifications

The "National Registry Advanced Emergency Medical Technician (AEMT) Examination Specifications" provides important information about the AEMT Certification Examination for stakeholders, such as current candidates, Emergency Medical Services (EMS) students, and EMS educators. The AEMT Certification Examination will be administered starting July 1, 2024.

This document outlines the content of the examination, as determined through the *2019 National EMS Practice Analysis* and *2021 National EMS Practice Analysis Addendum*, and it provides information regarding the development and administration of the examination. Also included are sample items and information about the item development process.

Examination Purpose

The aim of the AEMT Certification Examination is to determine whether EMS professionals at this provider level can demonstrate the entry-level knowledge, skills, and abilities required to competently perform their job. It is the expectation that a newly certified AEMT can:

- Provide safe and effective emergency medical care through the integration of knowledge and skills in various patient care presentations.
- Assess and manage the safety of all individuals involved in patient care during a call for service.
- Assess the patient to identify life threats and implement care to reduce mortality and morbidity without doing further harm.
- Apply the findings from the patient assessment using established clinical guidelines to determine appropriate patient interventions.
- Adjust treatment based on clinical guidelines, with evolving patient presentations that integrate assessment findings, patient response to interventions, and input from higher-level trained providers.

Development of the Test Plan

The AEMT Certification Examination has evolved over the past four decades to become the most valid, reliable, and respected measurement tool employed by millions of EMS providers nationwide in their

quest to attain National AEMT Certification. In order to ensure the examination measures current practice, the National Registry conducts practice analysis studies to identify the knowledge, skills, and abilities (KSAs) required in the EMS practice settings. The information gathered by practice analysis studies is then used to determine the content of the examinations, also known as a "test plan."

The *2019 National EMS Practice Analysis* examined the knowledge needed for the AEMT as it related to patient impression data. The patient presentations followed the historical division of four areas: 1) Airway, Respiration & Ventilation, 2) Cardiology & Resuscitation, 3) Trauma, and 4) Medical/Obstetrics/Gynecology. Additionally, the study explored the domain of EMS Operations.

Based on the results of the *2019 National EMS Practice Analysis* and additional feedback from the EMS community, in 2019 the National Registry's Board of Directors undertook an initiative, "Advanced Life Support (ALS) Assessment Redesign," intended to improve the processes of assessing entry-level competency using technology and emerging practices in the testing industry. As a part of the ALS redesign initiative, one major change to the program was to discontinue the existing psychomotor examination and embed new content into the cognitive examination that measures the critical skills of communication, leadership, and clinical judgment. This new domain, Clinical Judgment, was defined through the *2021 National EMS Practice Analysis Addendum*.

Content for the AEMT Certification Examination
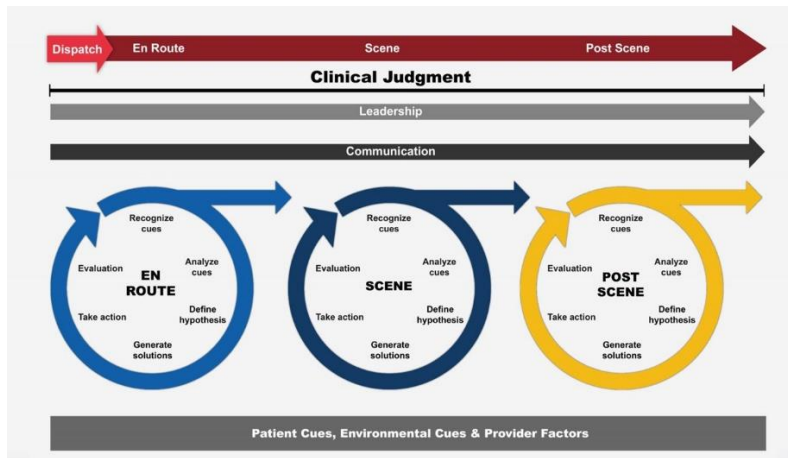
Cognitive Domains

The *2019 National EMS Practice Analysis* evaluated clinical impressions for the five areas, or "domains," described above. Tasks performed by the provider for these domains were also determined. These five domains are collectively referred to as the "cognitive domains":

1. Airway, Respiration, & Ventilation
2. Cardiology & Resuscitation
3. Trauma
4. Medical, Obstetrics & Gynecology
5. EMS Operations

Clinical Judgment

In accordance with the findings of the *2021 Practice Analysis Addendum* and subject-matter expert (SME) recommendations, the clinical judgment domain also samples information from two additional knowledge areas, communication and leadership in an EMS response, as well as from each step of the processing information cycle (Gugiu, McKenna, Platt, & Panchal, 2022). The steps of the processing information cycle are: (a) recognize cues, (b) analyze cues, (c) define hypothesis, (d) generate solutions, (e) take action, and (f) evaluation. As the EMS clinician moves from each setting within the EMS response, they re-evaluate and move through the processing information cycle again.

The Clinical Judgment domain is illustrated in the figure below:

Content Outline

The cognitive domains and the domain of Clinical Judgment collectively form the basis of the AEMT Certification Examination. The content of each domain was determined through the *2019 National EMS Practice Analysis* and *2021 Practice Analysis Addendum.* An overview is presented below of the knowledge areas that are sampled on the examination for each content domain:

| Content Domain	Knowledge Areas Sampled
Airway, Respiration & Ventilation	Assessment Pathophysiology Management
Cardiology & Resuscitation	Assessment Pathophysiology Management
Trauma	Assessment Pathophysiology Management
Medical/Obstetrics/Gynecology	Assessment Pathophysiology Management
EMS Operations	Maintenance & operation of emergency vehicles and equipment Leadership & professionalism Communication & documentation Preservation of medical & legal standards Environment of care
Clinical Judgment	Communication Leadership Recognize cues Analyze cues

Define hypothesis	
Generate solutions	
Take action	
Evaluation	

Content Distribution for the AEMT Certification Examination

The percentage of test questions aligned to each domain was determined through a statistical analysis of data collected through the *2019 National EMS Practice Analysis* and *2021 Practice Analysis Addendum* such that topics most critical for patient care are weighted more heavily. The percentage of the exam allocated to each content domain is presented below:

Content Domain	Percent of Examination
Airway, Respiration & Ventilation*	9% – 13%
Cardiology & Resuscitation*	11% – 15%
Trauma*	7% – 11%
Medical/Obstetrics/Gynecology*	25% – 29%
EMS Operations	6% – 10%
Clinical Judgment*	31% – 35%

* *Note:* items related to pediatric patient care will be integrated throughout the examination content.
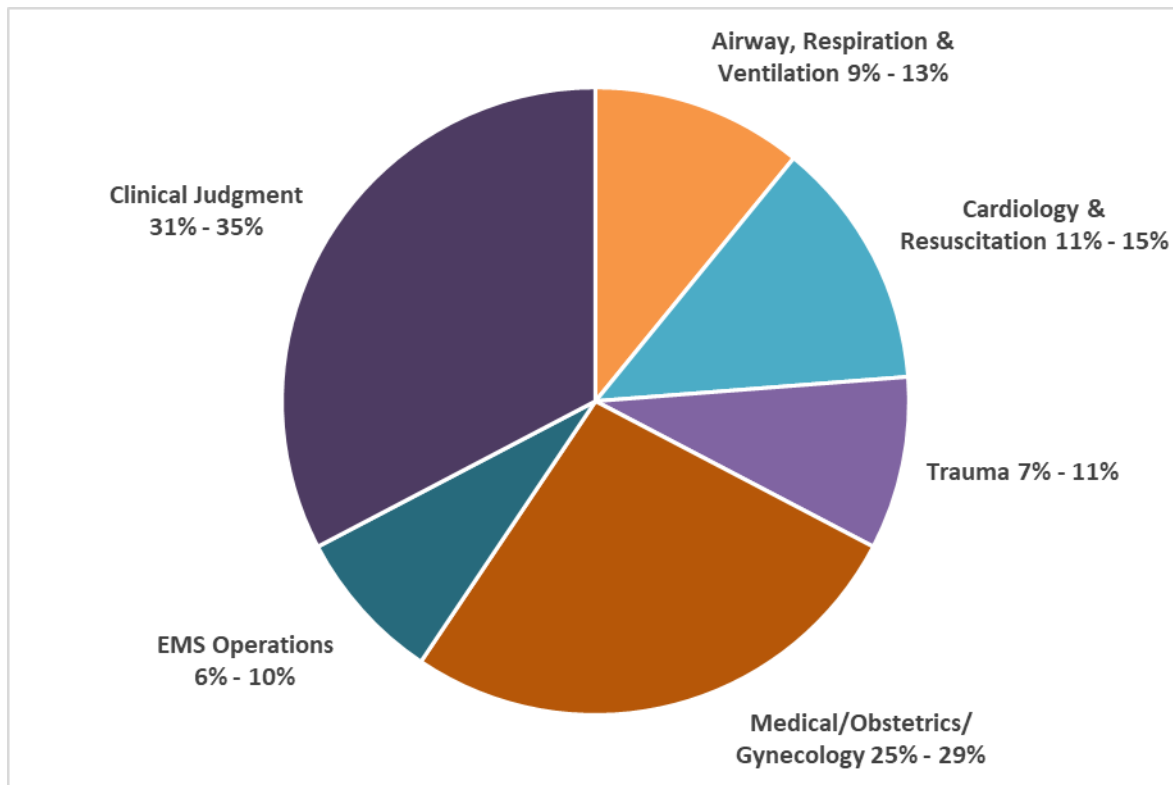
Item Development

The examination development process follows multiple steps. Examination items are developed to measure each of the content areas described in the test plan. Every examination item is written by an SME in EMS who is trained in item writing best practices and techniques. These experts also reference each item to industry-standard source materials.

The Examinations team then performs several rounds of internal review of each item for clinical accuracy, factual correctness, clarity, adherence to style guidelines, and reference completeness. Next, a committee of external SMEs reviews each item for accuracy, correctness, relevance, currency, and proper scope of practice. Items are then reviewed again by internal staff for final confirmation of adherence to all accuracy, quality, and stylistic standards.

The entire process to develop an examination item can take six months or longer from start to finish. Following the reviews, each item is piloted. That is, the item is placed as an unscored item on an examination to collect additional data to ensure the item is psychometrically sound before placement as a scored item in a future examination.

Examination Administration

Computer-Based Linear Testing

The AEMT examination is administered as a fixed-length linear computer-based test (CBT). The same number of items are administered to all candidates, although the items are not identical. Candidates select their answer and can change it prior to advancing to the next item. Candidates must provide an answer to each item. After the answer is submitted, candidates are unable to return to the item to modify their answer. Therefore, candidates are encouraged to answer each item to the best of their ability before submitting their answer. All items left unanswered at the completion of the examination, which would only occur if the candidate does not complete the examination in the allotted time, are scored as incorrect.

Examination Length

Candidates have 3 hours to complete the AEMT Certification Examination. The examination is administered in Pearson VUE testing centers and consists of 135 items.

Unscored Content

The examination includes 35 unscored pilot items. These items are included in the examination for purposes of collecting data to determine if the quality of the question meets the requirements to move forward on a future examination as a scored item. These items are not identified and will not affect a candidate's score.

Item Types

The AEMT Certification Examination includes a variety of item types. All items are scored dichotomously; that is, candidates receive full credit for a correct response. No credit is provided for a partially correct response. These item types are described below:

- **Multiple Choice:** Candidates must select one correct response out of four possible options.
- **Multiple Response:** Candidates must select two or three correct responses out of five or six possible options.
- **Build List:** Candidates must position several presented options into the order specified in the item instructions.
- **Drag-and-Drop:** Candidates must position several presented options into certain categories, classifications, or other identifiers as specified in the item instructions.
- **Options Box:** Candidates must classify, categorize, or identify several options presented in a table based on certain specified criteria.
- **Graphical:** Candidates must use information provided in graphical form to answer the item. Examples of the graphics presented include charts, capnography rhythm strips, images, and pictures. Graphics may be included in any of the above item types.
- **Scenario-Based:** Candidates answer multiple questions based on information contained in a "scenario" or reading passage. Scenario-based items may be any of the above types.

Sample Items

Sample items for the variety of item types are provided in **Appendix A**.

Passing Standard

The passing standard is the level of knowledge or ability that a competent EMS provider must demonstrate to achieve a passing score on the examination. The passing standard is determined through a standard-setting study, a formal qualitative process in which a trained psychometrician facilitates the collection of data provided by a representative panel of nationally based SMEs from the EMS workforce. The result of this study is a recommended cut score that is provided to the National Registry Board of Directors along with additional data for consideration regarding the impact on the EMS community and the public.

Once the standard is approved by the Board of Directors, it is uniformly applied to all candidates. The passing standard is reviewed each time new examination specifications are implemented.

Appendix A: Sample Items

Multiple-Choice Item

A 40-year-old patient fell from a roof and is unresponsive. Their vital signs are BP 190/110, P 44, R 28, and SpO_2 91% on room air. What is most likely causing the vital signs?

- ○ A. Increased intracranial pressure
- ○ B. Decreased brain stem pressure
- ○ C. Decreased intrathoracic pressure
- ○ D. Increased cardiac perfusion pressure

Multiple-Response Item

A 52-year-old patient has been experiencing severe chest discomfort and lightheadedness for 2 hours. The symptoms began while the patient was exercising and were not relieved with rest. What conditions are most likely causing the patient's presentation? Select the two answer options that are correct.

- ☐ A. Acute pericarditis
- ☐ B. Pulmonary embolism
- ☐ C. Myocardial infarction
- ☐ D. Exercise-induced asthma
- ☐ E. Spontaneous pneumothorax

Graphical Item

A 19-year-old patient has difficulty breathing after having an argument. The patient's vital signs are BP 140/90, P 116, R 40, SpO_2 95% on room air, and $EtCO_2$ 38 mmHg. The patient's waveform capnography is shown below:
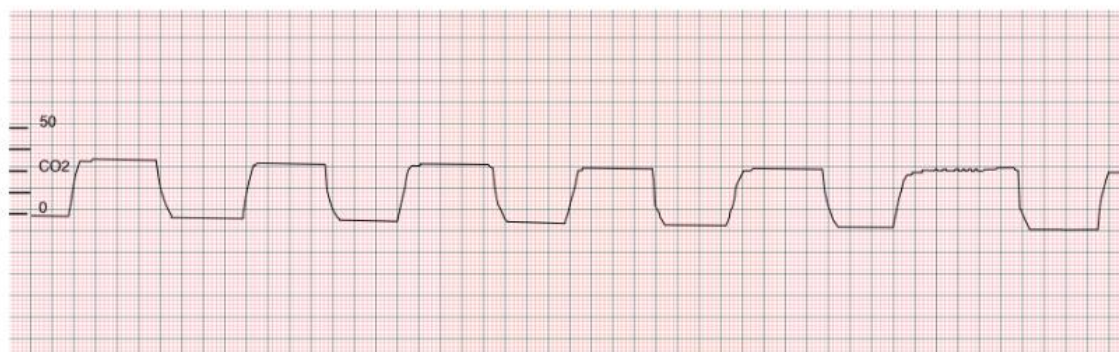
What does this waveform indicate, normal morphology or abnormal morphology?

- ○ A. Normal morphology, because the waveform is box-shaped and consistent
- ○ B. Normal morphology, because of the rate of the waveform
- ○ C. Abnormal morphology, because the waveform is box-shaped and consistent
- ○ D. Abnormal morphology, because of the rate of the waveform

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Scenario-Based Item

En Route   **Scene**   Post Scene

The patient (60 kilograms) is sitting awake in a dental suite. The patient says: "Just leave me alone now! Get away from me." The office staff states that the patient reported feeling weak upon arrival for the appointment, and then became confused. The patient had been instructed to start fasting at midnight for a dental procedure today.

The patient has a history of seizures, diabetes, hyperlipidemia, and recently, dental pain. Medications include insulin that is being administered by an automated external pump, carbamazepine, hydrocodone/acetaminophen, and atorvastatin. The patient has no allergies to medications.

The patient's skin is diaphoretic, and there are no signs of trauma. The patient obeys motor commands and moves all extremities. The patient cannot give their name, location, or the date. The eyes are open, and the pupils are 5 mm and reactive. Breath sounds are clear bilaterally. The vital signs are BP 156/90, P 124, R 10, SpO_2 95% on room air, and T 98°F (37°C). The blood glucose level is 47 mg/dL. The $EtCO_2$ is 40 mmHg.

Scene

Which of the following findings most strongly suggest a differential diagnosis of a diabetic emergency? Select the two answer options that are correct.

☐ A. End tidal carbon dioxide value

☐ B. Medical history

☐ C. Mental status

☐ D. Respiratory rate

☐ E. Pulse oximetry

The following Drag and Drop, Build List, and Options Box examples are all scenario-based items, as shown above. Only the item itself is shown here to better illustrate each item type.

Drag-and-Drop Item

Scene

Based on the patient findings, what is the most probable medical emergency, and what is the most appropriate treatment for that emergency? Move the most probable emergency into the **Answer Area**, and then move the most appropriate treatment into the **Answer Area**.

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Medical emergencies

| Opioid overdose |

| Hypoglycemia |

| Hypoxia |

Treatments

| Administering a dextrose solution |

| Administering intranasal naloxone |

| Administering high-flow oxygen |

Answer Area

[ ]   Most probable medical emergency

[ ]   Most appropriate treatment

Build List Item

Post Scene

What conditions are likely to explain the patient's continued signs and symptoms despite appropriate treatment? Move each option into the **Answer Area** to order the conditions from the most likely to least likely explanations of the continued signs and symptoms.

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Options		Answer Area
		Most likely (1) to least likely (3) explanations
Seizure	❯	
Diabetic emergency	❮	⌃
Respiratory distress		⌄

Options Box Item

Post Scene

Suppose the AEMT performs a reassessment. Which of the potential changes to the patient's presentation listed below would indicate that the patient's condition is improving, and which changes would indicate the patient's condition is worsening? Select two changes that would indicate that the condition is improving and select two changes that would indicate the condition is worsening.

• • • • •

Answer Area

	Condition improving (select 2 options only)	Condition worsening (select 2 options only)
Heart rate increases to 140	○	○
Patient starts to follow commands	○	○
Skin becomes dry	○	○
Tonic-clonic activity is observed	○	○