National Registry of Emergency Medical Technicians®
THE NATION'S EMS CERTIFICATION™

National Registry Paramedic Examination Specifications

About the Paramedic Examination Specifications

The "National Registry Paramedic Examination Specifications" provides important information about the Paramedic Certification Examination for stakeholders, such as current candidates, Emergency Medical Services (EMS) students, and EMS educators. The Paramedic 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 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 Paramedic 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 paramedic can:

- Provide safe and effective care with medical oversight through the integration of cognitive, psychomotor, and affective processes in various patient care presentations.
- Assess each scene to determine the safety of all individuals present at the scene.
- Assess the patient to identify threats to life and limb and implement care to reduce morbidity and mortality.
- Use fundamental knowledge of anatomy, physiology, and kinematics to identify concomitant injuries and reduce loss of life and limb.
- Apply fundamental knowledge of anatomy, pathophysiology, pharmacology, emergency cardiovascular care, and the etiology of disease processes to determine appropriate patient interventions and transportation destinations that will promote a positive patient.

Development of the Test Plan

The Paramedic 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 Paramedic 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 paramedic 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," which was 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 Paramedic Certification Examination

Cognitive Domains

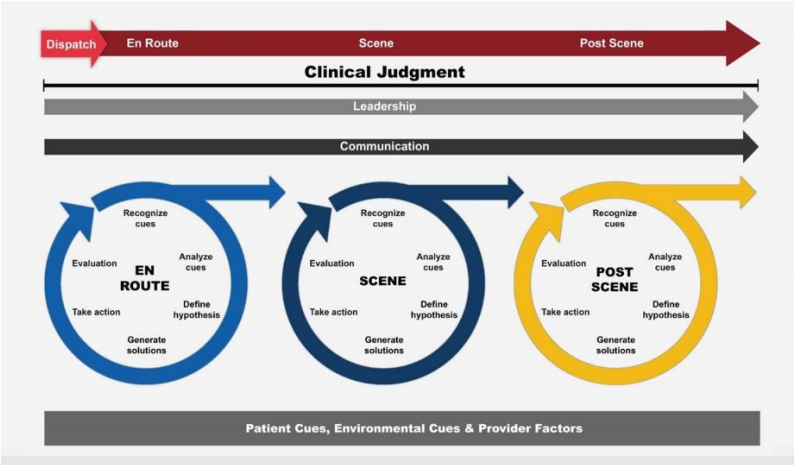
The *2019 National EMS Practice Analysis* evaluated clinical impressions for the five areas, or "domains," which were described above. Tasks performed by the provider for these domains were also determined. These five domains are collectively referred to as the "cognitive domains":

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 Paramedic Certification Examination. The content of each domain was determined through the *2019 National EMS Practice Analysis* and *2021 Practice Analysis Addendum.* An overview of the knowledge areas that are sampled on the examination for each content domain is presented below:

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

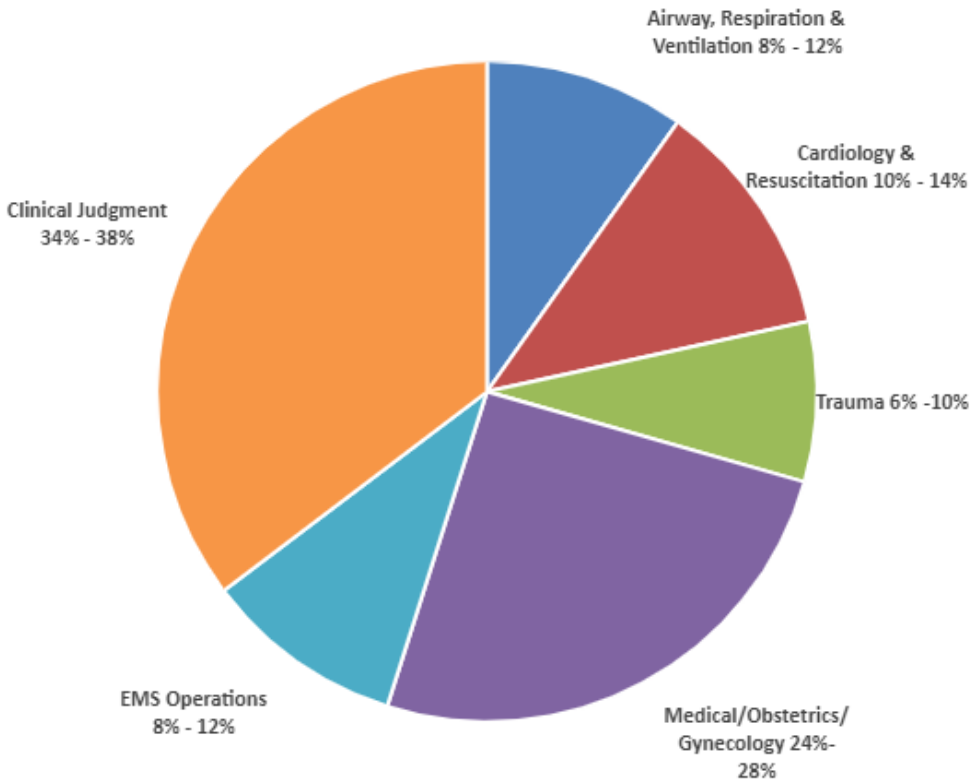
	Define hypothesis Generate solutions Take action Evaluation

Content Distribution for the Paramedic 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 *	8% – 12%
Cardiology & Resuscitation* **	10% – 14%
Trauma *	6% – 10%
Medical/Obstetrics/Gynecology*	24% – 28%
EMS Operations	8% – 12%
Clinical Judgment*	34% – 38%

* ***Note:*** items related to pediatric patient care will be integrated throughout the examination content.
** ***Note:*** 30% of the Cardiology & Resuscitation domain is allotted to graphical items with ECG rhythm strips.



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

Computerized Adaptive Testing (CAT)

The Paramedic Certification Examination is administered through a Computerized Adaptive Testing (CAT) format. CAT examinations are delivered in a different manner than fixed-length exams. After an initial set of items, the computer will begin to administer items that are targeted at or above the candidate's estimated level of ability.

Because the computer delivers items that are more aligned with the candidate's level of understanding, it can determine candidate proficiency in a fewer number of items in many cases. If the computer can make a pass/fail determination in the minimum number of items with 95% confidence, the test administration will end. In some circumstances, it may take longer, and the computer will continue to administer items until the maximum number of items is reached or the maximum time allotted is reached.

Examination Length

Candidates have 3.5 hours to complete the Paramedic Certification Examination. The examination is administered in Pearson VUE testing centers. Candidates will be required to answer a minimum of 110 items.

Unscored Content

The examination includes 20 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 Paramedic 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, ECG 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.

After 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 9-year-old patient is intubated and in respiratory arrest. The assessment reveals perioral cyanosis, decreased BVM compliance, and absent lung sounds on the left side. Vital signs are BP 70/30, P 110, respirations assisted at 20, and SpO_2 88%. The $EtCO_2$ is 58 mmHg. What should the paramedic do next?

- ○ A. Adjust the PEEP valve
- ○ B. Increase the ventilation rate
- ○ C. Remove the endotracheal tube
- ○ D. Perform needle decompression

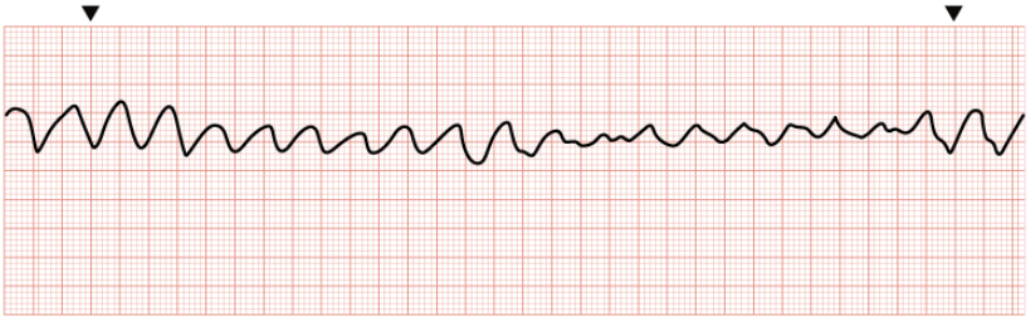
Multiple-Response Item

Which of the following medications are used to relax bronchial smooth muscle? Select the two answer options that are correct.

- ☐ A. Apixaban
- ☐ B. Epinephrine
- ☐ C. Nitroglycerin
- ☐ D. Magnesium sulfate
- ☐ E. Methylprednisolone

Graphical Item

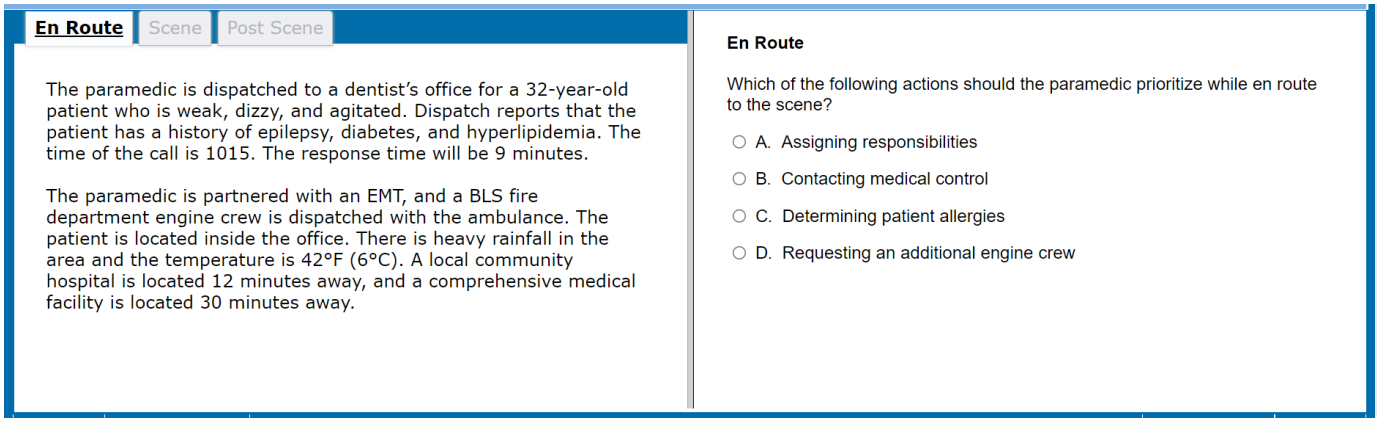
A 64-year-old patient is found lying on the ground in cardiac arrest. The patient's ECG is shown below:



Which of the following interventions are most important for the survival of this patient? Select the three answer options that are correct.

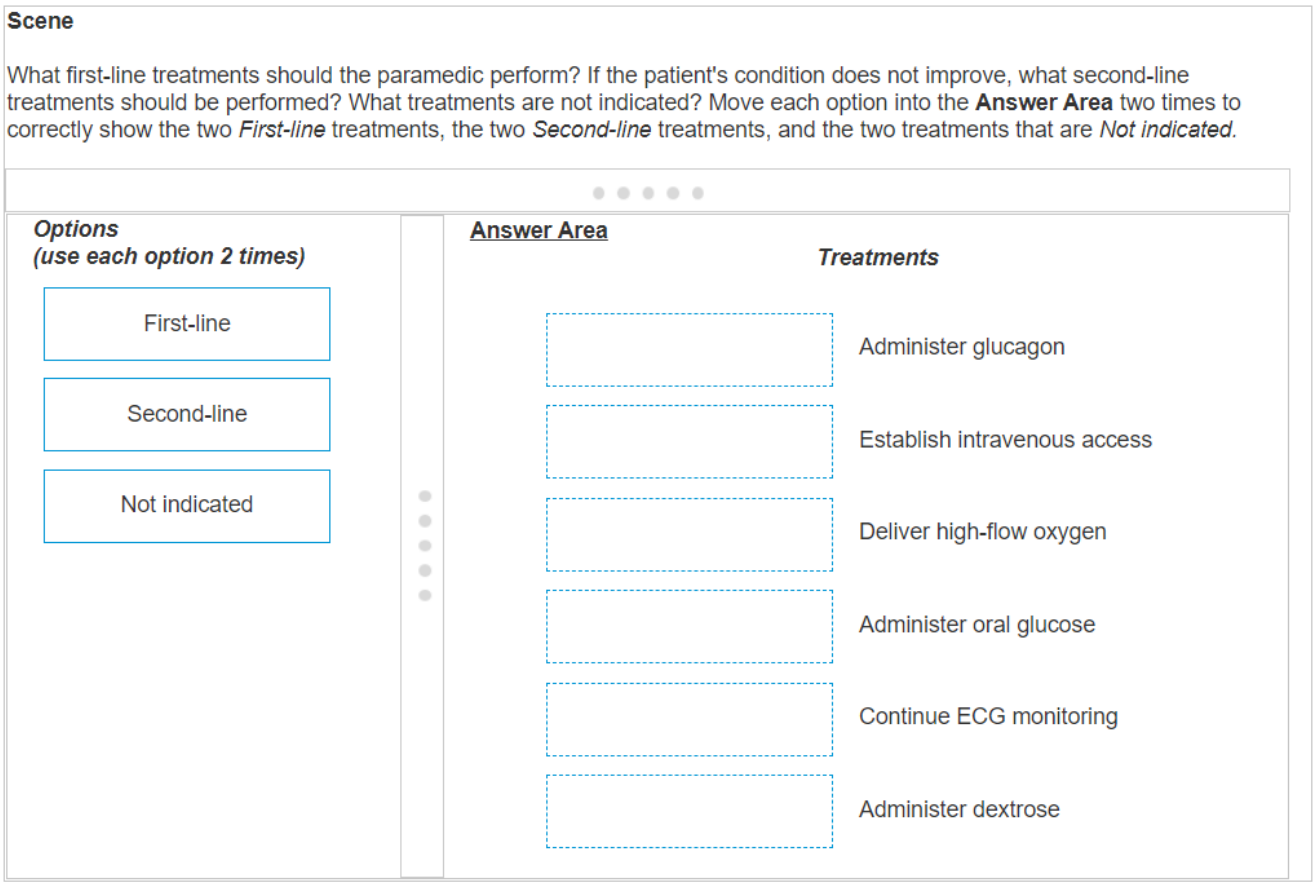
- ☐ A. Rapid defibrillation
- ☐ B. Naloxone administration
- ☐ C. Intravenous line initiation
- ☐ D. Early chest compressions
- ☐ E. Quickly inducing hypothermia
- ☐ F. Positive pressure ventilations

Scenario-Based Item



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



Build List Item

Scene

Based on the patient findings and history, what conditions should the paramedic most strongly suspect as the cause of this emergency? Move the options into the **Answer Area** to correctly order the conditions below from most likely to least likely cause of the emergency.

Options

- Stroke
- Diabetic emergency
- Respiratory distress
- Seizure

Answer Area

Order of conditions from most likely (1) to least likely (4) cause

Options Box Item

Post Scene

Consider how blood glucose levels are affected by the pancreatic hormones insulin and glucagon. What are the actions of insulin and glucagon, and what are their sources? Select the correct answers in the table below.

Answer Area

	Insulin (select 1 action and 1 source)	*Glucagon* (select 1 action and 1 source)
Action: Stimulates release of glycogen	○	○
Action: Stimulates cellular uptake of glucose	○	○
Source: Alpha cells	○	○
Source: Beta cells	○	○