



EMT-PARAMEDIC



National Standard Curriculum

EMT-PARAMEDIC: NATIONAL STANDARD CURRICULUM

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PREFACE

The National Highway Traffic Safety Administration (NHTSA) has assumed responsibility for the development of training courses that are responsive to the standards established by the Highway Safety Act of 1966 (amended). Since these courses are designed to provide national guidelines for training, it is NHTSA's intention that they be of the highest quality and be maintained in a current and up-to-date status from the point of view of both technical content and instructional strategy.

To this end, NHTSA supported the current project which involved revision of the 1985 *Emergency Medical Technician-Paramedic: National Standard Curriculum*, deemed of high value to the states in carrying out their annual training programs. This curriculum was developed to be consistent with the recommendations of the *National Emergency Medical Services Education and Practice Blueprint*, the *EMT and Paramedic Practice Analysis*, and the *EMS Agenda for the Future*. This course is one of a series of courses making up a National EMS training program for prehospital care. The *EMT-Paramedic: National Standard Curriculum*, represents the highest level of education in EMS prehospital training.

The EMT-Paramedic: National Standard Curriculum represents the minimum required information to be presented within a course leading to certification as a Paramedic. It is recognized that there is additional specific education that will be required of Paramedics who operate in the field, i.e. ambulance driving, heavy and light rescue, basic extrication, special needs, and so on. It is also recognized that this information might differ from locality to locality, and that each training program or system should identify and provide special instruction for these training requirements. This curriculum is intended to prepare a medically competent Paramedic to operate in the field. Enrichment programs and continuing education will help fulfill other specific needs for the Paramedic's education.

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From the very beginning of this revision project, the Department of Transportation relied on the knowledge, attitudes, and skills from hundreds of experts and organizations. These individuals and organizations sought their own level of involvement toward accomplishing the goals of this project. These contributions varied from individual to individual, and regardless of the level of involvement, everyone played a significant role in the development of the curriculum. It is essential that those who have assisted with the achievement of this worthy educational endeavor be recognized for their efforts. For every person named, there are many more individuals who should be identified for their contributions. For all who have contributed, named and unnamed, thank you for sharing your vision. Your efforts have helped assure that the educational/training needs of Paramedics are met so that they can provide appropriate and effective patient care.

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THE EMT-PARAMEDIC: NATIONAL STANDARD CURRICULUM

History

The last revision of the EMT-Paramedic: National Standard Curriculum occurred in the early 1980s with a completed curriculum published in 1985. This current revision came about as a result of the National Highway Traffic Safety Administration's (NHTSA) January 1990 *Consensus Workshop on Emergency Medical Services Training Programs*. Participants discussed the national training curricula needs of Emergency Medical Service (EMS) providers. Using a nominal group process, the participants identified the top priority needs for EMS training in the United States.

The top priorities identified at that meeting led to revision of the EMT-Basic: National Standard Curriculum in 1994 and the First Responder: National Standard Curriculum in 1995. Upon the completion of these curricula, NHTSA funded a project to revise the EMT-Paramedic: National Standard Curriculum, EMT-Intermediate: National Standard Curriculum, and Associated Refresher programs. This curriculum is a result of that contract.

As stated in the contract, this curriculum is specifically designed to address the educational needs of the traditional paramedic. It is not intended to expand the scope of practice of the Paramedic. It is designed to provide a solid foundation for professional practice and additional education with a heavy emphasis on clinical problems solving and decision making.

The development utilized a variety of resources to help in curricular decision making. They included, but were not limited to: National Emergency Medical Services Education and Practice Blueprint, ASTM F1489-93, A Standard Guide for Performance of Patient Assessment by the EMT-Paramedic, Institute of Medicine's Report - Emergency Medical Services for Children, The EMS Agenda for the Future, The EMT and EMT-Paramedic Practice Analysis. These resources provided invaluable insight and assistance throughout the curriculum development.

The Curriculum Development Process

Because of the size of this project, many individuals were brought together to develop the curriculum. These extraordinarily talented individuals were organized into groups and teams. The Administrative Team's primary responsibility was to assure that the project was proceeding according to plan and to serve as a "hub" for the various groups and individuals involved in the many aspects of curriculum development.

The content of this curriculum was developed by writing teams that were each assigned a unit of the curriculum. Each writing team consisted of at least one author, one subject matter expert, and up to eight adjunct writers. These writing teams consisted of some of the most experienced educators and clinicians in emergency medicine. The authors were responsible for coordinating the writing group and actually developing the materials. The subject matter experts were responsible for the accuracy of each section. The subject matter experts were nationally recognized content experts. For all medical areas, the subject matter expert was a physician. The adjunct writers contributed to the development and review of the material.

The peer reviewers of the curriculum represented professionals from around the country who expressed

an interest in participating in the curriculum development process. They had the opportunity to submit comments about each draft of the curriculum to the writing team for consideration. The National Review Team consisted of representatives from national EMS organizations. The National Review team received every draft of the curriculum, and had the opportunity to register organizational opinions. Additionally, the National Review Team had two face-to-face meetings. These meetings were instrumental in developing consensus opinions on controversial issues.

The National Association of State EMS Directors and the National Council of State EMS Training Coordinators made extraordinary contributions to the overall design, development, and content of the curriculum throughout the project. More importantly, these organizations will assume the responsibility for implementing the curriculum in the coming years.

One pilot of the paramedic curriculum was conducted by the Center for Emergency Medicine in Pittsburgh, Pennsylvania. As part of their in-kind service to the project, the Joint Review Committee of Educational Programs for the EMT-Paramedic selected sites from around the country to serve as field test. These sites were asked to implement a draft of the curriculum and provide feedback to the administrative team. Both the pilot test and the field test sites were an important component of the curriculum development. The project team gained valuable insight into the implementation of this curriculum.

The National Registry of EMTs' support of this project was extraordinary. The National Registry contributed to the design and development of the examinations and final evaluation tools that were used in the pilot program, as well as the tabulation and evaluation of scores. They contributed significantly to the design and development of the skill sheets that are contained within this curriculum. The National Registry provided financial support for meetings of the group leaders.

The Joint Review Committee on Educational Programs for the EMT-Paramedic conducted surveys that were used to establish the clinical requirements. They also developed the affective evaluation tools.

Curriculum Goal and Approach

A curriculum is only one component of the educational process. Alone, it cannot assure competence. The goal of this curriculum is to be part of an educational system that produces a competent entry level paramedic. For the purpose of this project, competence was defined relative to the Description of the Profession.

Description of the Profession

The first step in the curriculum design phase of the project was to define the profession in terms of general competencies and expectations. The Description of the Profession was drafted and underwent extensive community and peer review. It was designed to be both practical and visionary, so as to not limit the growth and evolution of the profession. Ultimately it served as the guiding document for the curriculum development. The Description of the Profession also provided the philosophical justification of the depth and breadth of coverage of material. The Description of the Profession for the Paramedic is attached as Appendix A.

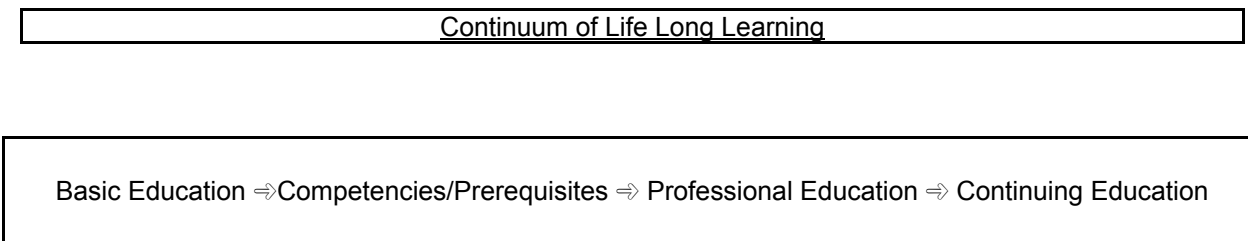
Educational Model

From the Description of the Profession, an Educational Model was developed to achieve the goals of the

course. This Educational Model also went through extensive community and peer review. This is a graphical representation of the major components of the curriculum. The Paramedic Educational Model was designed to be consistent with, and build upon, the Educational Model for the EMT-Basic. The Educational Model is not intended to imply a rigid order or sequence of the material. Course planners and educators should adapt and modify the order of the material to best meet their needs and those of their students.

Much of the material in the preparatory section sets the stage for the rest of the course. Although there is no requirement to adhere to the order of the model, most educators agreed that this information should be presented early in the course. Additionally, Airway and Ventilation and Patient Assessment are fundamental skills and knowledge areas and should be presented toward the beginning of the course of study. In the Educational Model, the Medical and Trauma modules appear on either side Patient Assessment. In general, it is assumed that most programs will cover this material after the Preparatory, Airway, and Patient Assessment material.

The Model is also designed to emphasize the role of professional education as part of life long learning (fig. 1).



The EMT-Paramedic: National Standard Curriculum Diagram of Educational Model is attached as Appendix B.

Competencies

Paramedic program directors often comment that poor basic skills become problematic when attempting to teach many parts of the paramedic course. Deficiencies in basic skills are difficult to overcome throughout the course, but are most evident when teaching communication skills, documentation, and pharmacology math skills. It is not the intent of professional education to teach basic skills, but rather build on an existing base of academic competencies. The Paramedic curriculum assumes competence in English and math prior to beginning the course.

Documentation skills rely far more heavily on spelling, grammar, vocabulary and syntax than on the mastery of the specialized form of report writing that is found in health care. If, through program evaluation, a program identifies less than satisfactory results in documentation skills, it should raise the prerequisite level of English competence.

Similarly, if a program has difficulty with the student's pharmacology math skills, it is suggested that the prerequisite level of math competence be increased, rather than attempting to remediate these basic skills in the context of paramedic education.

The Functional Job Description of the Paramedic (appendix C), conducted by the National Registry of EMTs in 1997 identifies competence in math at the high school level and reading at the post high school level is necessary to perform as an entry level Paramedic. It is suggested that programs assess applicant's basic skills prior to entry into training. If the competence of the applicant falls below this level, the student should be encouraged to remediate the deficiency prior to pursuing paramedic certification. If the program chooses to enroll students below these basic skills levels, it is the program's responsibility to provide individual tutoring, increase course time, provide remedial education, or require co-requisite course work to improve the candidates basic skills prior to graduation.

Course Length

Basic academic skills play a very important role in course length and attrition rate. Attrition rate is a function of the groups basic academic skills and the length of the course. If course length remains constant, and the basic skills of the applicants decreases, the attrition rate will rise. Correspondingly, if a program seeks to decrease its attrition rate or increase examination performance, it may do so by increasing the basic academic skills of its students, increasing course length, or both. This information should be taken into account in course planning.

The emphasis of paramedic education should be competence of the graduate, not the amount of education that they receive. The time involved in educating a paramedic to an acceptable level of competence depends on many variables. Based on the experience in the pilot and field testing of this curriculum, it is expected that the average program, with average students, will achieve average results in approximately 1000-1200 hours of instruction. The length of this course will vary according to a number of factors, including, but not limited to:

- student's basic academic skills competence
- faculty to student ratio
- student motivation
- the student's prior emergency/health care experience
- prior academic achievements
- clinical and academic resources available
- quality of the overall educational program

Appendix D is a summary of the time that each of the eight field test sites needed to cover a draft of the curriculum. These times are meant only as a guide to help in program planning. Training institutes MUST adjust these times based on their individual needs, goals and objectives. These times are only recommendations, and should NOT be interpreted as minimums or maximums. Those agencies responsible for program oversight are cautioned against using these hours as a measure of program quality or having satisfied minimum standards. Competence of the graduate, not adherence to arbitrary time frames, is the only measure of program quality.

Prerequisites

There are two prerequisites for the Paramedic curriculum: EMT-Basic and Anatomy and Physiology.

EMT-Basic

It has been a long held tradition to use EMT-Basic certification as a prerequisite for more advanced EMS

education, and this curriculum continues that tradition. It is important to note that some educators have questioned the practice of using EMT-Basic as a required certification prior to enrollment in Paramedic education. In fact, no studies have been able to verify EMT-Basic certification or experience as a predictor of success in paramedic education. Of course, paramedics are required to be competent in *all* of the skills and knowledge of and EMT-Basic, and this knowledge base and skills competence should be verified during paramedic education.

Although this curriculum identifies EMT-Basic as a prerequisite, we have done so in the absence of empirical data suggesting that this is appropriate. We encourage flexibility in approaching the issue of EMT-Basic as a prerequisite to paramedic education. We also recognize that it may be possible to incorporate all of the material of an EMT-Basic class into a paramedic program, eliminating the need for it as a prerequisite. Clearly, more research is needed.

Anatomy and Physiology

The Paramedic curriculum has identified course work in anatomy and physiology as either a pre- or co-requisite. A mastery of anatomy and physiology, beyond that covered in the anatomy and physiology review of each section of the curriculum is assumed throughout this curriculum. EMS educational programs have many options to address anatomy and physiology in paramedic education. For programs that have access to formal anatomy and physiology classes, an appropriate level course can be identified as a pre or co-requisite to paramedic training. For other programs, anatomy and physiology can be “front loaded” in the paramedic course, or presented throughout the course.

There are many resources to aid EMS training sites and instructors in teaching an appropriate level of anatomy and physiology to current or prospective paramedic students. These texts and materials are available from many health care, medical and nursing publishers. Publishers usually have significant instructor and program support materials, usually including: textbooks, student workbooks, lesson plans, audiovisual materials, test banks, etc.

A list of objectives has been derived from many of the currently available resources in anatomy and physiology instruction. All of these objectives were consistently found in allied health educational programs or other non-science curricula. A list of the anatomy and physiology objectives that are considered pre- or co-requisite to paramedic education is found in appendix E. Paramedic programs should select courses or textbooks which cover this level of material.

Life Long Learning/Continuing Education

Continuing education is an integral component of any professional education process and the paramedic must be committed to life-long learning. The Paramedic curriculum must fit within the context of a continuing educational system. This is necessary due to the continually changing dynamics and evolution of medical knowledge.

This curriculum is designed to provide the student with the essentials to serve as an entry level paramedic. We recognize that enrichment and continuing education will be needed in some cases to bring the student to full competency. We strongly urge employers and service chiefs to integrate new graduates into specific orientation training programs.

It is important to recognize that this curriculum does not provide students with extensive knowledge in hazardous materials, blood-borne pathogens, emergency vehicle operations or rescue practices in

unusual environments. These areas are not core elements of education and practice as identified in the *National EMS Education and Practice Blueprint*. Identified areas of competency not specifically designed within the EMT-Paramedic: National Standard Curriculum should be taught in conjunction with this program as a local or state option.

PARAMEDIC EDUCATION

Society is becoming more demanding in all areas in education. The current trend in professional education is to demonstrate, in quantitative ways, the value and quality of the program. Simply adhering to standards is no longer adequate to convince the stake holders that educational programs are satisfying the needs of its constituency. Government, society, and the profession are demanding that educational programs are held accountable for the product that they are producing. This section of the curriculum briefly describes critical components, along with adherence to the Paramedic: National Standard Curriculum, that will enable programs to objectively demonstrate their value and quality.

Sponsorship

Paramedic education should take place in an academic environment. An academic environment has services such as a library, student counseling (education, academic, psychological, career, crisis intervention), admissions, financial aid, learning skills centers, student health services, etc. Additionally, an academic environment offers such advantages as admissions screening, standardized student selection criteria, registrar, record keeping, bursar, student activities, collegial environment, formal academic credit, medial resources, and vast institutional resources.

The financial resources should be adequate for the continued operation of the educational program to ensure each class of students is funded to complete the course. The budget should reflect sound educational priorities including those related to the improvement of the educational process.

Admissions for students should be made in accordance with clearly defined and published practices of the institution. Specific academic, health related, and/or technical requirements for admission shall be clearly defined and published. The standards and/or prerequisites must be made known to all potential applicants.

The program should be responsible for establishing a procedure for determining that the applicant's or students' health will permit them to meet the written technical standards of the program. Students should be informed of and have access to health services. The health and safety of students, faculty, and patients associated with educational activities must be adequately safeguarded.

Accurate information regarding program requirements, tuition and fees, institutional and programmatic policies, procedures, and supportive services shall be available to all prospective students and provided to all enrolled students. There should be a descriptive synopsis of the current curriculum on file and available to candidates and enrolled students. There should be a statement of course objectives, copies of course outlines, class and laboratory schedules, clinical and field internship experience schedules, and teaching plans on file and available.

Student and faculty recruitment and student admission and faculty employment practices shall be non-discriminatory with respect to race, color, creed, sex, age, disabling conditions, and national origin. The program and sponsoring institution should have a defined and published policy and procedure for processing student and faculty grievances.

Policies and processes for student withdrawal and for refunds of tuition and fees shall be published and made known to all applicants. Policies by which student may perform service work while enrolled in the program must be published and made known to all concerned in order to avoid practices in which students are substituted for regular staff.

Student records shall be maintained for student admissions, attendance, academic counseling and evaluation. Grades and credits for courses shall be recorded and permanently maintained by the sponsoring institution.

Program Planning/Communities of Interest

As with all professional education, it is critically important that Paramedic education programs are planned, executed and evaluated in a continuous quality improvement model. Only through a thorough assessment of the needs of the community, the establishment of goals to meet those needs, and program evaluation relative to those needs, will a program be able to demonstrate its quality and value.

Every professional education program is designed and conducted to serve a number of communities of interest. It is incumbent on the program directors to identify who is being served by the program, and adapt the program to best meet those needs. The program's goal statement should help to clarify the communities that the program serves. Although students are the consumer of the educational program, they are not the customer of the product. Ultimately, the program serves the employers of graduates, not students. Typically, the communities of interest include directors, managers, and medical directors who hire or supervise graduates. Other communities of interest might include: colleagues, government officials, hospital administrators, insurance companies, patients, and the public.

As part of the planning process, the program should regularly assess the communities of interest, and establish objectives to best serve them. One way to survey the communities of interest is to establish an advisory board consisting of representatives from various communities of interest and regularly question them as to their expectations of entry level Paramedics. The program would use this information for program planning. Specifically, the program should use this information to clarify how to achieve their program goals and objectives.

Program Goal

Each paramedic program should have a program goal. The program goal is a statement of the desired outcome of the program, and typically references graduating competent entry-level providers. By design, program goals are broad based, but establish the parameters by which the effectiveness of the program will be evaluated. A program may have multiple goals, but most use one for clarity. For example, a typical program goals statement might read:

The goal of the ABC Paramedic Education program is to produce competent, entry level

Paramedics to serve in career and volunteer positions in XYZ county.

If the program provided additional training that is clearly not within the definition of the entry level practitioner, then additional information should be included in the goal. Education planning should be based on the program goal, the mission of the sponsoring institution, and the expectations of the health care community. The goal should be made known to all members of the communities of interest, especially the students and faculty.

The goal will be used to select appropriate curricular materials, clinical experiences, and many other aspects of program planning.

Program Objectives

Objectives are more specific statements of the outcomes of the program, and are derived from the program goal in conjunction with the communities of interest. The program can establish as many objectives as they see fit to accurately reflect the program goal. Often, programs find it useful to establish objective along the three domains of learning. Examples might include:

Program Cognitive Objective:

At the completion of the program, the graduate of the ABC Paramedic Education Program will demonstrate the ability to comprehend, apply, and evaluate the clinical information relative to his role as an entry level paramedic in XYZ county.

Program Psychomotor Objective:

At the completion of the program, the student will demonstrate technical proficiency in all skills necessary to fulfil the role of entry level paramedic in XYZ county

Program Affective Objective:

At the completion of the program, the student will demonstrate personal behaviors consistent with professional and employer expectations for the entry level paramedic in XYZ county.

Goals and objectives must be consistent with the needs of the communities of interest, e.g. the program sponsors, employers, students, medical community, and profession. There may be some goals that are important institutional goals that are not useful program goals. The only goals that are considered program goals are those that relate specifically to the competencies attained in the program.

Use of the Goals and Objectives in Program Evaluation

Program goals and objectives form the basis for program assessment. Once the goals and objectives are established, they serve as a mechanism to evaluate the effectiveness of the program. By utilizing a variety of evaluation methodologies (performance of graduates on certification exams, graduate surveys, employer surveys, medical director surveys, patient surveys) the program can evaluate their effectiveness at achieving each objective. For example, if graduates consistently perform poorly on the cardiac section of certification exams, and graduates, employers, and medical directors all state that students are weak in cardiology, the program should critically evaluate this section of their curriculum.

Programs are encouraged to evaluate each objective in as many ways as possible. For example, graduate cognitive skills could be evaluated by performance on standardized tests, certification exams, graduate surveys, employer surveys, and medical director surveys. This provides much more information than using one source of data.

Course Design

The paramedic program should consist of four components of instruction: didactic instruction, skills laboratory, clinical education, and field internship. The first three typically occur concurrently, and the field internship serves as a verification that the student is serving as a competent, entry level practitioner.

Didactic Instruction

The didactic instruction represents the delivery of primarily cognitive material. Although this is often delivered as lecture material, instructors are strongly encouraged to utilize alternate delivery methods (video, discussion, demonstration, simulation, etc.) as an adjunct to traditional classroom instruction. The continued development and increased sophistication of computer aided instruction offers many options for the creative instructor. It is not the responsibility of the instructor to cover all of the material in a purely didactic format, but it is the responsibility of the program director to assure that all students are competent over the material identified by the declarative section.

Skills Laboratory

The skills laboratory is the section of the curriculum that provides the student with the opportunity to develop the psychomotor skills of the paramedic. The skills laboratory should be integrated into the curriculum in such a way as to present skills in a sequential, building fashion. Initially, the skills are typically taught in isolation, and then integrated into simulated patient care situations. Toward the latter part of the program, the skills lab should be used to present instructional scenarios to emphasize the application and integration of didactic and skills into patient management.

Clinical Education

Clinical education represents the most important component of paramedic education since this is where the student learns to synthesize cognitive and psychomotor skills. To be effective, clinical education should integrate and reinforce the didactic and skills laboratory components of the program. Clinical instruction should follow sound educational principles, be logically sequenced to proceed from simple to complex tasks, have specific objectives, and be closely supervised and evaluated. Students should not be simply sent to clinical environments with poorly planned activities and be expected to benefit from the experience.

The ability to serve in the capacity of an entry level paramedic requires experience with actual patients. This process enables the student to build a database of patient experiences that serves to help in clinical decision making and pattern recognition. A skilled clinical educator must point out pertinent findings and focus the beginner's attention.

Program directors should be cautioned against using time as a criteria to determine the quantity of clinical

education. More than any other phase of paramedic education, minimum amounts of patient contacts and frequency of skills performed must be established for clinical education. It is acceptable to use a time based system to help in program planning, but a system must be used to assure that every student satisfies each and every clinical objective.

Typically, clinical education for the paramedic takes place in both the hospital and field environments:

Hospital Clinical - Because of the unpredictable nature of emergency medicine, the hospital environment offers two advantages in paramedic education: volume and specificity. In the hospital setting, the paramedic student can see many more patients than is possible in the field. This is a very important component in building up a "library" of patient care experiences to draw upon in clinical decision making.

The use of multiple departments within the hospital enables the student to see an adequate distribution of patient situations. In addition to emergency departments, which most closely approximate the types of patients that paramedics should see, clinical education should take advantage of critical care units, OB/GYN, operating rooms/anesthesia, recovery, pediatrics, psychiatric, etc. This will help assure a variety of patient presentations and complaints. These also provide a more holistic view of health care and an appreciation for the care that their patients will undergo throughout their recovery. This places emergency care within context.

Paramedic programs throughout the country have created clinical learning experiences in many environments. There is application to emergency medical care in almost any patient care setting. When a particular location lacks access to some patient populations, educational programs have created innovative solutions. Programs are encouraged to be creative and seek out clinical learning experiences in many settings. Examples include: morgues, hospices, nursing homes, primary care settings, doctor's offices, clinics, laboratories, pharmacies, day care centers, well baby clinics, and community and public health centers.

Field Clinical - It is unreasonable to expect students to derive benefit from being placed into a field environment and performing. Field clinical represents the phase of instruction where the student learns how to apply cognitive knowledge and the skills developed in skills laboratory and hospital clinical to the field environment. In most cases, field clinical should be held concurrently with didactic and hospital clinical instruction.

Field instruction, as well as hospital clinical, should follow a logical progression. In general, students should progress from observer to participant to team leader. The amount of time that a student will have to spend in each phase will be variable and depend on many individual factors. One of the largest factors will be the amount and quality of previous emergency care experience. With the trend toward less and less EMT experience prior to paramedic education, program directors must adjust the amount of field experience to the experience of the students.

Clinical affiliations shall be established and confirmed in written affiliation agreements with institutions and agencies that provide clinical experience under appropriate medical direction and clinical supervision. Students should have access to patients who present common problems encourage in the delivery of advanced emergency distributed by age and sex. Supervision should be provided by instructors or preceptors appointed by the program. The clinical site should be periodically evaluated with respect to its continued appropriateness and efficacy in meeting the expectations of the programs. Clinical affiliates should be accredited by the Joint Commission on Accreditation of Healthcare Organizations.

Field Internship

The final ability to integrate all of the didactic, psychomotor skills, and clinical instruction into the ability to serve as an entry level paramedic is conducted during the field internship phase of the program. The field internship is not an instructional, but rather an evaluative, phase of the program. The field internship should occur toward the end of the program, with enough coming after the completion of all other instruction to assure that the student is able to serve as an entry level paramedic. During the field internship the student should be under the close supervision of an evaluator.

Field internship must occur within an emergency medical service which demonstrates medical accountability. Medical accountability exists when there is good evidence that the EMS providers is not operating as an independent practitioner, and when field personnel are under direct medical control of on-line physicians or in a system utilizing standing orders where timely medical audit and review provide quality improvement.

Quality improvement is also a required component of EMS training. The role of medical direction is paramount in assuring the provision of highest quality out-of-hospital care. Medical Directors should work with individuals and systems to review out-of-hospital cases and strive to achieve a sound method of continuous quality improvement.

Student Assessment

Any educational program must include several methods for assessing student achievement. As mentioned before, quizzes of the cognitive and psychomotor domains should be provided regularly and frequently enough to provide the students and the faculty with valid and timely indicators of the student's progress toward and the achievement of the competencies and objectives stated in the curriculum. Ultimately, the program director is responsible for the design, development, administration and grading of all written and practical examinations. This task is often delegated to others. Some programs use outside agency developed or professionally published evaluation instruments. This does not alleviate the program's responsibility to assure the appropriateness of these exam materials. All examinations used within the program must have demonstrated validity and reliability and conform to psychometric standards. Programs are encouraged to use outside sources to validate examinations and/or as a source of classroom examination items.

The primary purpose of this course is to meet the entry-level job expectations as indicated in the job description. Each student, therefore, must demonstrate attainment of knowledge, attitude, and skills in each area taught in the course. It is the responsibility of the educational institution, program director, medical director, and faculty to assure that students obtain proficiency in all content areas. If after counseling and remediation a student fails to demonstrate the ability to learn specific knowledge, attitudes and skills, the program director should not hesitate to dismiss the student. The level of knowledge, attitudes and skills attained by a student in the program will be reflected in his performance on the job as a paramedic. This is ultimately a reflection on the program director, primary instructor, medical director and educational institution. It is not the responsibility of the certifying examination to assure competency over successful completion of the course. Program directors should only recommend qualified candidates for licensure, certification or registration.

Requirements for successful completion of the course are as follows:

Cognitive - Students must demonstrate competency of all content areas. This is most often done using quizzes, regular topical exams, and some combination of comprehensive exams (mid terms and finals). Cognitive evaluations must be reliable and viable. Programs should incorporate psychometric principles whenever possible. For example, item analysis should be utilized to assure discrimination on achievement tests. Scores on tests of known validity and reliability should be correlated to teacher made examinations. Medical director should take examinations and provide content validity input. Examinations should be balanced to areas within the course. Pass/fail scores should be established with an understanding of standard setting. Decisions regarding the continuation of students in class need to be made following a pattern of performance. One test failure should not result in failure from the program. Grading practices should be standardized to prevent bias by instructional staff. Essay and open ended questions should be clearly written and acceptable answers should be known before the examination is administered. Test should be kept secure and reviewed by students during class time. Programs should investigate methods to Special remedial sessions may be utilized to assist in the completion of a unit or module of instruction. Scoring should be in accordance with accepted practices.

Affective - Students must demonstrate professionalism, conscientiousness and interest in learning. The affective evaluation instruments contained within this curriculum were developed using a valid process and their use is strongly recommended. Just as with cognitive material, the program cannot hold a student responsible for professional behaviors that were not clearly taught. The professional attributes evaluated using this instrument references the material in the Roles and Responsibilities of the Paramedic section of the curriculum. The instruments can be incorporated into all four components of the program: didactic, practical laboratory, clinical and field internship. Students who fail to do so should be counseled while the course is in progress in order to provide them the opportunity to develop and exhibit the proper attitude expected of a paramedic. See appendix F.

Psychomotor - Students must demonstrate proficiency in all skills. A complete list of skill competencies expected to be completed within the program should be available to each student. Students should know pass/fail score of any instrument utilized within an educational program. Whenever possible multiple evaluators recording performance of a student should be made. Scenarios should be medically accurate and flow as they would in a typical EMS call. In clinical and field internship all instructional staff must be familiar with psychomotor instruments and expectations. Inter-rater reliability between various instructional staff must be monitored by the program. Clinical and field instructional staff orientations may help resolve issues of inter-rater reliability. Course ending skills examinations should be administered. Special remedial sessions may be utilized to assist in the completion of a unit or module of instruction. Pass/fail scores should be in accordance with accepted practices. It is strongly recommended that program utilize the skills evaluation instruments provided in this curriculum. See appendix G.

Students should be evaluated in all three domains in didactic, practical laboratory, clinical and field internship. For example, the students cognitive knowledge can be evaluated in the clinical setting by direct questioning or discussions. Secondly, if an IV is started on a patient, the psychomotor skill should

be evaluated. Finally, the affective domain, their professional attributes can be measured. This example also applies to skills laboratories. In the skills laboratory, the cognitive domain can be measured by asking questions about the skill, and the affective domain can be measured by their attitude in learning and practicing the skills.

Program Personnel

There are typically many individuals involved in the planning and execution of a paramedic program. For clarity, the following terms are defined as they will be used throughout this document.

These identified roles and responsibilities are a necessary part of each paramedic program. The individuals carrying them out may vary from program to program and from locality to locality as the exact roles interface and overlap. In fact, one person, if qualified, may serve in multiple roles.

Program Director

The Program Director is the individual responsible for course planning, organization, administration, periodic review, program evaluation, continued development, and effectiveness. The program should have a full-time Program Director while the program is in progress, whose primary responsibility is to the educational program. The program Director should contribute an adequate amount of time to assure the success of the program. The program director shall actively solicit and require the cooperative involvement of the medical director of the program.

The program director must have appropriate training and experience to fulfill the role. They should have at least equivalent academic training and preparation and hold all credentials for which the students are being prepared, or hold comparable credentials which demonstrate at least equivalent training and experience.

The program director should have training and education in education and evaluation and be knowledgeable in administration of education and related legislative issues for paramedic education. The program director should assume ultimate responsibility for the administration of the didactic, clinical, and field internship phases of the program. It is the program directors responsibility to monitor all phases of the program and assure that they are appropriate and successful.

Program Faculty

The depth and breadth of paramedic education has evolved through the years and expanded considerably from the early days of emergency medicine. It is no longer reasonable to assume that one individual possesses the required depth of knowledge to be able to teach the entire program. As a result the Program Director and/or Course Coordinator should use content area experts extensively through the program.

Course Medical Director

Medical direction of the paramedic is an essential component of out-of-hospital training. Physician involvement should be in place for all aspects of EMS education. The Course Medical Director of the paramedic program should be a local physician with emergency medical experience who will act as the ultimate medical authority regarding course content, procedures, and protocols. All of the program faculty

should work closely together in the preparation and presentation of the program.

The Course Medical Director can assist in recruiting physicians to present materials in class, settling questions of medical protocol and acting as a liaison between the course and the medical community. During the program the Medical Director will be responsible for reviewing the quality of care rendered by the paramedic student in the clinical and field setting. The Course Medical Director should review all course content material and examinations. The medical director should periodically observe lectures and practical laboratories, field and clinical internships. The medical director should participate in clinical instruction, student counseling, psychomotor and oral testing, and summative evaluation.

Most importantly, the Course Medical Director is responsible to verify student competence in the cognitive, affective and psychomotor domains. Students should not be awarded course ending certificates unless the medical director and program director can assure through documentation of completion of terminal competencies that each student has completed the full complement of education. Documentation of completion of course competencies should be affixed to the student file with signatures of the medical director and program director at the completion of the course.

Licensure, Certification and Registration

State regulatory agencies may require specific evaluation of cognitive and psychomotor performance prior to official licensure, certification or registration as a Paramedic. This is in addition to course completion and may be required by state regulations. The National Registry of EMTs is a recognized agency that provides examinations for certification and registration that may be required by your state. The program director should contact the State Office of Emergency Medical Services for licensure, certification or registration information.

Program Evaluation

On-going evaluation must be initiated to identify instructional or organizational deficiencies which affect student performance. The evaluation process should include both objective and subjective methods. Main methods of objective evaluation generally used are: 1) Graduates' performance on standardized examinations, and 2) Graduates' performance in practice in accordance with established standards of care. Group and individual deficiencies may indicate problems in conducting the education program.

Subjective evaluation should be conducted at regular intervals by providing students with written questions on their opinions of the program's strengths and weaknesses. Students should be given the opportunity to comment on the instruction, presentation style and effectiveness. Students should also be asked to comment on the program's compliance with the specified course of instruction, the quality and quantity of psychomotor skills labs, clinical rotations, and the validity of the examinations.

The purpose of this evaluation process is to strengthen future educational efforts. All information obtained as part of the subjective evaluation should be reviewed for legitimacy and possible incorporation into the course. Due to the important nature of this educational program, every effort should be made to ensure the highest quality instruction.

Facilities

The physical environment for the provision of the paramedic program is a critical component for the success of the overall program. The facility should sufficient space for seating all students. Abundant space should be made available for demonstration during the presentation of the course material. Additional rooms or adequate space should be available to serve as a practice area. The facility should be well lit for adequate viewing of various types of visual aids and demonstrations. Heating and ventilation should assure student and instructor comfort and the seats should be comfortable with availability of desk tops or tables for taking notes. There should be an adequate number of tables for display of equipment, medical supplies, and training aids. A chalkboard (flip chart, grease board) should be in the main hall. A projection screen and appropriate audio visual equipment should be located in the presentation facility. Practice areas should be carpeted and large enough to accommodate six students, one instructor, and the necessary equipment and medical supplies. Tables should be available for practice areas, with appropriate and sufficient equipment and medical supplies.

Equipment and Supplies

Sufficient supplies and equipment to be used in the provision of instruction shall be available and consistent with the needs of the curriculum and adequate for the students enrolled. The equipment must be in proper working order and sufficient to demonstrate skills of patients in various age groups. It is recommended that all the required equipment for the program be stored at the facility to assure availability for its use.

HOW TO USE THE CURRICULUM

There are eight modules of instruction in the core content. There are 52 sections within the eight modules. Each section has the following components:

Unit Terminal Objective

The unit terminal objective represents the desired outcome of completion of the block of instruction. In most cases it is a very high level objective, which can make it difficult to evaluate. This global objective represents the desired competency following completion of the section. Although this objective may be viewed as the aggregate of lower level objectives, in many cases, the whole is greater than the sum of the parts.

Objectives

These are the individual objectives of the curriculum. Mastery of each of these objectives provides the foundation for the higher order learning that is expected of the entry level provider. The instructor and student should strive to understand the complex interrelationships between the objectives. These objectives are not discrete, disconnected bits of knowledge, but rather fit together in a mosaic that is inherently interdependent. The objectives are divided into three categories: Cognitive, Affective, and Psychomotor.

Cognitive
mental process--
perception
reasoning
intuition

Affective
emotional process--
feelings

Psychomotor
physical process--
muscular activity

To assist with the design and development of a specific unit, each objective has a numerical value, e.g., 3-2.1. The first number is the module of instruction, followed by a hyphen and the number of the specific unit. For example, 3-2.1 is:

Module 3:	Patient Assessment
Unit 3-2:	The Initial Assessment
Objective 3-2.1	Summarize the reasons for forming a general impression of the patient. (C-1)

At the end of each objective is a letter for the type of objective: C = Cognitive; A = Affective; and P = Psychomotor. (The example above is cognitive). The number following the type of objective represents the level of objective: 1 = Knowledge; 2 = Application; and 3 = Problem Solving. (The example above is knowledge).

Declarative

This material is designed to provide program directors and faculty with clarification on the depth and breadth of material expected of the entry level paramedic. **The declarative material is not all inclusive. The declarative section of the curriculum lack much of the specific information that must be added by the instructor.** The declarative information represents the bare minimum that should be covered, but the instructor must elaborate on the material listed. Every attempt has been made in development of the declarative material to avoid specific treatment protocols, drug dosages or other material that changes over time and has regional variations. It is the responsibility of the instructors to provide this information.

Specifically, the declarative material is used to help instructors develop lesson plans and instructional strategies. It is also designed to assist examination and publishers in developing appropriate evaluation materials and instructional support materials. **It is of utmost importance to note that the declarative material is not designed to be used as a lesson plan, but rather it should be used by instructors to help develop their own lesson plans.**

Clinical Rotations

The clinical rotations that appear in the EMT-Paramedic: National Standard Curriculum represent a stark departure from previous clinical education recommendations. In the past, clinical competence was determined simply by the number of hours spent in various clinical environments. As there is no assurance that time produced an adequate number of clinical exposures resulting in entry level clinical competence, a different approach was taken with this curriculum. In-kind services were provided by the Joint Review Committee for EMT-Paramedic Program Accreditation (JRC).

The JRC survey all existing accredited programs and asked them to identify the number of psychomotor skills, patient age groups, pathologies, patient complaints and team leader skills they were currently

utilizing in order to identify competent entry level Paramedics. The results of the survey were then presented to the JRC sponsoring organization committee members who possess expertise in cardiology, pediatrics, anesthesia, surgery, emergency medicine and Paramedic education. Using both subject matter expertise and the results of the surveys of accredited programs, the JRC established the clinical rotation goals presented in this curriculum. Items presented in bold are essentials and must be completed by each student within the program. Items in italics are recommendations to achieve the essential.

Although these patient exposures cover a wide domain of skills, pathologies, complaints and ages, they can be achieved in either the clinical or field internship. For example, a student may demonstrate the ability to perform a comprehensive assessment, formulate and implement a treatment plan for patients with chest pain in either a hospital critical care unit or during an encounter in the field. If the patient in this example was not experiencing chest pain at the time of the student evaluation, but had experienced chest pain which resulted in admission to the critical care unit. This interaction would suffice for meeting the clinical rotation for one encounter with a chest pain patient. During this experience the student should complete an evaluated physical examination, a history based upon the initial and present condition of the patient and formulate a treatment plan for the patient based upon initial field or admission findings. This same principle of encountering patients who have identified pathologies or complaints within the past 48 hours will suffice for meeting the clinical rotation requirement.

Some categories can be counted more than once. For example if a student in the field internship encounter a patient with chest pain who was 68 years old and start an IV, the student would obtain credit for a complaint, an age and a skill. The established IV and chest pain assessment, and treatment and implementation plan must be evaluated and the patient age group credit must be recorded. Encounters without evaluation and recording should not be awarded credit.

Obviously during the education the best experience would occur in the field setting which most approximates the function of the job. Recognizing the extended field time that would be necessary to see the recommend variety of patient conditions and skills would be infeasible, the curriculum permits students to obtain these experiences in either hospital clinical or field. The team leaders skills can not be met during hospital rotations. The JRC recommends that a student will obtain credit for one patient for each encounter. For example if a patient has both chest pain and a syncope episode, the student can utilize this experience for either a chest pain patient or a syncope patient, but not for both. The program must develop a clinical rotation patient tracking system in order to assure that each student encounters the recommended number of skills, ages, pathologies, complaints and team leader skills.

The clinical rotations contained within this curriculum are being accomplished by Paramedic education programs at the time of the curriculum revision. These rotations do not represent an increase in clinical requirements. The program director along with the community of interest should use feedback loops that are part of the program evaluation process to either increase or decrease the number of patient exposures based upon valid measurement instruments utilized in graduate surveys. If employers or graduates indicate the need for increased patient encounters in order to bring current graduates to the level of competency then the program should increase the number of encounters to correspond to this need. Likewise if graduates and employers indicate some rotations provided more than competent experience the program may reduce the number of patient encounters within the recognized category.

Although the categories were researched by the JRC, a program director, medical director or community of interest may add different encounters in order to meet community needs. For example if a program is located in an area with a large geriatric population, the program may increase the number of encounters with geriatric patients to correspond to community needs.

EDUCATING PROFESSIONALS

It has long been recognized that paramedics, as an integral part of the health care team, are health care professionals. As such, the education of paramedics should follow a professional, rather than purely technical, model of instruction. Employers and patients are significantly increasing their expectations of paramedics, and EMS education will need to respond.

In *Responsive Professional Education*, Stark, Lowther, and Hagerty (1986), propose that professional preparation is a combination of developing both professional competence and professional attitudes.

Historically, most EMS education has focused primarily on technical competence. Technical competence is only one component of professional competence. Professional competence includes six subcategories:

Conceptual competence - Understanding the theoretical foundations of the profession

Technical competence - Ability to perform tasks required of the profession

Interpersonal competence - Ability to use written and oral communications effectively

Contextual competence - Understanding the societal context (environment) in which the profession is practiced

Integrative competence - Ability to meld theory and technical skills in actual practice

Adaptive competence - Ability to anticipate and accommodate changes (e.g. technological changes) important to the profession.

The main areas of focus of the National Standard Curriculum are on conceptual and technical competence. This revision of the paramedic curriculum is the first to address the strategies of interpersonal and therapeutic communication. Unfortunately, conceptual, technical, and interpersonal competencies are only part of the competencies required for reflective practice.

It is incumbent on the program to keep contextual, integrative and adaptive competence in mind through the entire program. These are not discreet topic areas and do not easily lend themselves to behavioral objectives. Programs and faculty members must constantly weave these issues into the conceptual and technical components of the course.

Contextual competence is an appreciation for how the professional's practice fits into larger pictures. Professional practice is not conducted in a vacuum, but impacts, and is impacted upon, by many forces. Of course, entry level paramedics understand how their practice affects individual patients. In addition, they must appreciate how their actions impact the EMS system where the work, the overall EMS system, the profession, the health care system, and society in general.

Teaching to improve contextual competence requires constant reinforcement of the interdependent nature of professional practice. Faculty must have a clear understanding of the relationship that EMS has with the health care system, the environment and society in general. Faculty must strive to repeatedly emphasize the "big picture" and not to fall into the trap of considering the individual practitioner, or the EMS profession, as a separate entity.

Integrative competence is generally built by having a strong mastery of the theoretical base of the content material. Students can often memorize treatment protocols (practice) without having a grasp of the underlying pathophysiology. In the short term, this enables them to pass the test, but results in poor ability

to integrate the material. Eventually, this shortfall manifests itself as poor decision making and problem solving skills. Medical education must balance theory and practice and constantly emphasize the relationship between the two. Theory and practice are not discreet, mutually exclusive concepts, but rather the flip sides of the same coin.

Another way to improve integrative competence is to broaden the base of educational exposures of the student. It has been repeatedly demonstrated that a broad distribution of course work, typical in liberal studies educational approach, increases integrative competence. Although not always possible, programs which are not satisfied with their graduates' ability to integrate theory and practice may find that adding additional courses from other disciplines will improve the students higher level cognitive skills.

It is effectively impossible for a centrally developed curriculum to identify specific objective and declarative material for contextual, integrative and adaptive competence, but their importance cannot be overstated. Individual instructors and programs must keep these competencies in mind as they are developing instruction strategies to build entry level competence. These competencies are often the result of leadership, mentoring, role modeling, a focus on high level cognition, motivation and the other teaching skills of the faculty.

Professional attitudes, in large part, represent the affective objectives of the program. Unfortunately the development of true professional attitudes are much more than the aggregate sum of the individual objectives. These attitudes represent the social climate, moral and ethical identity of the individual and the profession. These attitudes are influenced and shaped, through role modeling, mentoring, and leading by example. It is very difficulty to "teach" in a didactic sense and this is often interpreted by students as preaching. Generally, professional attitudes are best nurtured through leadership and mentoring. Faculty are encouraged to provide a positive role model for the development of professional attitudes in all interactions with students. Paramedic programs should take seriously their responsibility to develop the following professional attitudes:

Professional identity - The degree to which a graduate internalized the norms of a professional

Ethical standards - The degree to which a graduate internalizes the ethics of a profession

Scholarly concern for improvement - The degree to which a graduate recognizes the need to increase knowledge in the profession through research

Motivation for continued learning - The degree to which a graduate desires to continue to update knowledge and skills.

Career marketability - The degree to which a graduate becomes marketable as a result of acquired training

Emergency medicine, like all professions, has a professional culture, personality, behaviors and attitudes that we consider acceptable. The opinion that others have about our profession are profoundly influenced by the professional identity of each of our members. It is very important that we shape our identity consciously, or run the risk of being misunderstood by others. The degree to which new graduates adopt the behaviors and attitudes that the profession considers to be acceptable is a measure of our success in shaping each student's professional identity.

Ethical behavior is one of the cornerstones of professional attitudes. Ethics involves the critical evaluation of complex problems and decision making that takes into account the ambiguity that is most often present in professional decisions. Ethical behavior and decision making involves the ability to consider the greater social ramifications of your actions.

It is becoming increasingly important to have empirical data to validate clinical decisions. This fact is significantly increasing the role of research in medicine. Every medical professional must understand and appreciate the role of research in the future of health care. Of course, not all health care providers will be conducting research, but everyone must be committed to the concept of research as the foundation for decision making.

Primary professional education is just the beginning of a life long journey. The art and science of medicine changes over time. This requires that the professional adopt, from the beginning of practice, a sincere commitment to personal growth and continual improvement.

The last professional attitude is really a function of all that we have discussed. An individual's career marketability is a function of his ability to integrate professional competencies and professional attitudes into his own practice and work habits. Not only will this affect the ability to gain initial employment, but they will significantly impact his promotion potential. It is a very real and practical responsibility of education to prepare professionals for the work place and position them to be able to progressively be promoted. This keeps quality individuals intellectually stimulated, professionally challenged, and financially satisfied so they will not feel a need to leave the profession.

Professional education is a journey; not a destination. It is impossible, and fruitless, to dissect professionalism into increasingly smaller objectives. Mastery of hundreds or thousands of individual objectives does not assure that the graduate will integrate these objectives into professional behaviors. Like Humpty Dumpty, all of the parts may not be able to be assembled into a meaningful whole. There are many people who have mastered various parts of professional competence, but are not able to integrate and synthesize the skills into effective practice. This is the art of medicine, and is not taught specifically, but nurtured and allowed to grow through the creation of a supportive and positive environment.

Appendix A

EMT-Paramedic: Description of the Profession

Appendix B

EMT-Paramedic: Educational Model

Appendix C

Paramedic: Functional Job Analysis

Appendix D

Field Test Program Hours

Appendix D includes information to help program directors make decisions about the length of the program. A pilot test of the curriculum was conducted and all of the cognitive, psychomotor, and clinical objectives were completed in 1122 hours (435 classroom, 171 practical laboratory, clinical/field 516). The following information represents the amount of time needed to complete the course objectives by the pilot and field test sites.

For each unit, we have reported the range, average, standard deviation (SD), and median number of hours spent in didactic and practical laboratory.

Based on this information, and the performance of students in the pilot and field test program, it is recommended that the course be planned for approximately 1000-1200 total hours of instruction (500-600 classroom/practical laboratory, 250-300 clinical, 250-300 field internship.)

Appendix E

Anatomy and Physiology Prerequisite Objectives

Appendix F

Affective Evaluations

Appendix G

Psychomotor Skills Evaluations

Appendix H

Module and Unit Objective Summary