Medical Application of Science for Health

Introduction

Every summer since 1988, hundreds of high school students in Arkansas have donned surgical scrubs or lab coats at Area Health Education Centers (AHECs), the University of Arkansas for Medical Sciences (UAMS), and community hospitals in order to learn more about health careers. With a special emphasis on rural youth, the Medical Application of Science for Health program, or M*A*S*H, has exposed high school students to the many careers available in the fields of medicine, nursing, pharmacy, dentistry, and allied health.

The M*A*S*H Program was created by faculty at AHEC Pine Bluff in 1988 with 19 participants. The program encourages young people to explore the application of scientific concepts to the health care field. Through a variety of experiences, the students interact with health care experts, such as physicians, nurses, medical technologists, radiologic technologists, respiratory therapists, pharmacists, and dietitians. Each professional provides students with practical information concerning basic scientific theories relative to their fields. Emphasis is on components and functions of the health care team in an interdisciplinary approach.

During this two-week program, students complete certification in Basic First Aid, Basic Life Support (CPR), and learn the importance of healthy lifestyle habits. Reinforcement of the connection of the basic sciences to medical diagnosis and treatment occurs through lectures, labs, and clinical interaction. Exposure to different areas of medicine and the health related professions is an integral part of the M*A*S*H experience. Students learn to identify some of the various health care disciplines, what they do, how they relate to one another, and how the fundamentals of anatomy, biology, pharmacology, and physiology work in each discipline.

For students from rural areas, M*A*S*H demonstrates that students can pursue challenging career opportunities in their own non-metropolitan communities. Many students may feel that highly technical equipment and corresponding technicians are only available in large, urban areas. By participating in M*A*S*H programs in their own or similar communities, rural students can observe the true availability of various types of medical equipment and treatment and the need for appropriately trained professionals.
Program Objectives

All sites follow common objectives, including procedure training, hands-on activities, and the shadowing of different health professionals. Students also tour a variety of health care settings, such as rehabilitation centers, nursing homes, community health centers, fitness centers, veterinary clinics, and the University of Arkansas for Medical Sciences campus.

Upon completion of this two-week program, the student will be able to:

1. Demonstrate a better understanding of medical terminology.
2. Appreciate the important of basic science theories in relation to medical diagnosis and treatment.
3. Describe the role of each participating healthcare team member to the care of an individual patient.
4. Perform simple diagnostic procedures that demonstrate the student understands basic science theories.
5. Administer First Aid to accident victims to include bandaging, control of bleeding, splinting, and spinal immobilization. Students will receive Red Cross certification in Basic First Aid.
6. Administer and become certified in Basic Life Support (CPR).
7. Demonstrate an increased awareness of teenage health-related issues, enabling an individual to make informed decisions based on scientific data.

Specific Program Activities

The two-week program consists of lectures, labs, and clinical interactive sessions. Educational methods include lecture, demonstration, and hands-on application of principles learned. Instructional materials include slide presentations, video programs, computer-assisted instructional programs, mannequins, and various laboratories, diagnostic and therapeutic equipment. During the clinical interactive sessions, M*A*S*H students may be assigned to shadow several different health care professionals. This allows students to experience first-hand the link between basic sciences and various aspects of health care. Student evaluations in past years have rated this part of the M*A*S*H program as the highlight of the two week program.

All M*A*S*H students complete training in Basic Life Support taught by certified instructors. Certified instructors of the American Red Cross also provide basic First Aid education. As part of their personal health/wellness education, all students participate in a cardiovascular fitness assessment, which may include a basic physical fitness examination, treadmill exercise monitoring, or circuit training, and tours of regional fitness centers at all M*A*S*H locations. Teenage health issues that students have requested include nutrition, stress management, physiology of aging, communicable diseases, death and dying, substance abuse, teen sexuality/pregnancy, and personality analysis.
An introduction to Radiologic Technology is an experience shared at all sites. Students learn and observe how certain energy waves (radiation, sound, magnetic) assist in visualizing internal anatomy and function. Students may actively participate in making and developing X-ray films and observe interpretation of the results.

In the field of Respiratory Therapy, students see how the measurements of dissolved blood gasses assess respiratory status in health and disease. Included are demonstrations of simple principles of physics that aid in treating respiratory ailments (such as diffusion, volume, and barometric pressure). Students may perform simple respiratory function testing, observe and participate in respiratory rehabilitation efforts, and perform simple therapeutic procedures on actual patients.

In order to familiarize students with the field of Physical/Occupational Therapy, the presentations of simulation games introduce them to specific physical ailments and handicaps. The therapist may demonstrate an initial evaluation of a patient’s complaint to determine what problems are evident and describe the development of a treatment plan to assist the patient in recovering from his/her disability. Students will become familiar with treatments that include use of heat, cold soaks, packs, stretching, and range of motion exercises, transcutaneous electrical motor stimulation and use of prosthetic and assistive devices such as canes and walkers.

To help students fully understand the healthcare team concept, participants may accompany an interdisciplinary team composed of physicians, nurses, residents, students or allied health personnel’s as they go through a typical day’s activities. This may include attending morning reports, making hospital rounds, and observing patient care in a clinic setting. While in the clinic, students may have opportunity to observe how computers help physicians make decisions concerning patient care. They may also participate in laboratory and X-ray testing; and observe a demonstration and explanation of electrocardiograph testing. In an outpatient clinical setting, students may observe various methods of health care delivery and see how patient educational activities integrate into the process.

The students are involved in a M*A*S*H program, Monday through Friday, for two weeks, usually starting at 8 AM and ending at 4 PM. Below is a listing by day of potential M*A*S*H activities. An important daily exercise not included in the table below is the teaching of medical terminology, making it relevant to the professions and/or procedures explored each day.
Typical Student Learning Activities:

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<thead>
<tr>
<th>Week</th>
<th>Day</th>
<th>Activities</th>
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<tbody>
<tr>
<td>1</td>
<td>Monday</td>
<td>General Introductions, Hospital Orientation, Suturing Workshop</td>
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<td>Tuesday</td>
<td>Surgical Procedure, Casting Workshop, Healthy Lifestyles</td>
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<td>Wednesday</td>
<td>Pre-natal Care, Labor and Delivery, Newborn Care Activities</td>
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<td></td>
<td>Thursday</td>
<td>Introduction to Pharmacy, Shadowing, Poison Control</td>
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<td></td>
<td>Friday</td>
<td>Shadowing, Medical Social Work, Hear Dissection</td>
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<tr>
<td>2</td>
<td>Monday</td>
<td>Burn Unit, Respiratory Care</td>
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<td></td>
<td>Tuesday</td>
<td>Today’s Shadowing Assignments, First Aid Training</td>
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<td></td>
<td>Wednesday</td>
<td>Medical Terminology, Lab Activities</td>
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<td></td>
<td>Thursday</td>
<td>Today’s Shadowing Assignments, CPR Instruction</td>
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<td>Friday</td>
<td>Public Health Activities, Graduation Ceremony</td>
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ELIGIBLE PARTICIPANTS

This two-week day program is open to entering junior and senior high school students who live within driving distance to a M*A*S*H site. Students interested in participating in a M*A*S*H program must meet the following criteria:

1. Complete biology course prior to their participation in M*A*S*H
2. Demonstrate scholastic ability measured by transcript and GPA
3. Demonstrate ability to be task committed and utilize creative and critical thinking skills
4. Thoroughly complete the student application (including an essay stating why the student wants to participate)
5. Receive recommendations from school personnel (such as the principal, counselor or science teacher)
6. Receive recommendations from the site selection committee, which may consist of the M*A*S*H director, a Farm Bureau representative, members of the hospital staff and others members as desired

Approximately 15-25 students are selected by individual M*A*S*H selection committees, with many of the students coming from rural schools. Targeting students who are interested in science and related health careers regardless of race, gender, economic status, or physical ability is a priority. However, particular emphasis is given to schools in rural areas, medically underserved communities, students of minority status, and those with no previous involvement in M*A*S*H.

Information on the summer program is sent by regional AHEC staff to science department chairmen/teachers, school counselors, and health education teachers in all high schools within each district of the eight Area Health Education Centers(AHECs) in Pine Bluff, El Dorado, Batesville, Fayetteville, Fort Smith, Jonesboro, Helena, and Texarkana, and the Rural Hospital Program partners. Incoming junior and senior students who have completed a biology class are encouraged to apply. M*A*S*H Program Directors may visit area high schools and speak with interested students to increase awareness and participation in the program.

Other recruitment activities include the distribution of posters, pamphlets, flyers, and application packets to high school principals, superintendents, counselors, and special subject teachers statewide. Public service announcements about M*A*S*H are made through the cooperation of local television stations, radio, and newspapers. Special emphasis is placed on recruiting minority students through minority churches and other related organizations.
Dissemination and Public Relations

A standardized press release describing all M*A*S*H programs, sponsors, etc. is distributed by Arkansas Farm Bureau and includes asking local television stations to feature the program during their broadcasts.

An M*A*S*H information sheet is sent to appropriate personnel in communities within each AHEC region to solicit recommendations and applications. During the course of the program, photographs and videotaping are encouraged in order to capture student activities on film for future promotional use. Newspapers from the hometowns of accepted students may receive a press release describing the program and the student’s participation.

Instructor Selection Criteria

Healthcare professionals selected as instructors for this program must meet the following criteria:

1. Practice within close proximity to the facility where M*A*S*H is conducted
2. Have the ability to relate well to high school students
3. Have a high level of expertise in their field
4. Demonstrate enthusiasm about the opportunity to work with young people
5. Demonstrate sensitivity and a positive attitude about all healthcare professions, particularly in rural areas.

Evaluation

An evaluation tool has been developed to rate the overall M*A*S*H program. Students complete the evaluation tool anonymously on the final day of the program under supervision of a neutral instructor. M*A*S*H Program Directors then send a copy of the completed forms to the AHEC Central Office in a Final Report. The survey that was done in Fall 2008 had a response rate of 21% (223/1042).

An AHEC database tracks M*A*S*H participants who enter UAMS for professional education programs offered in the Colleges of Nursing, Medicine, Pharmacy, Public Health, and Health Related Professions. Students in the College of Medicine who participated in M*A*S*H in high school can return as M*A*S*H Assistants and serve as mentors to high school students who choose to follow in their footsteps.