

TAMALPAIS UNION HIGH SCHOOL DISTRICT
Larkspur, California

Course of Study

WILDERNESS MEDICINE

I. INTRODUCTION

Wilderness Medicine is a five credit, junior year, non-departmental elective, site specific course for students in the Team Program at Tamiscal High School. The primary foci of the course are providing students with practical knowledge of human anatomy and physiology and the ability to assess and stabilize patients with life-threatening medical problems in situations where definitive medical treatment is not immediately available.

This course addresses the following Tam2000 goals:

Student Success: Prepare our students for lives of personal, academic, and professional growth, achievement, and fulfillment.

- Set and maintain world class academic standards and the highest expectations for student social behavior and personal performance: assess and communicate performance in meeting those standards.
- Provide support services needed by students to ensure their success in school.
- Provide opportunities for, and encourage students to, demonstrate individual and collective responsibility, creativity, productivity, and initiative through class, school, and community projects and experiences.
- Provide opportunities for meaningful adult/student contacts for each student.
- Provide opportunities for students to acquire the technological skills needed for personal, educational, and employment success.
- Provide a school environment which enhances and supports student success.

This course addresses the following Student Learning Outcomes:

- #2. Read and analyze material in a variety of disciplines
- #3. Use technology as a tool to access information, analyze and solve problems, and communicate ideas.
- #6. Demonstrate scientific literacy.
- #12. Demonstrate school-to-work/post-secondary transition skills and knowledge.
- #13. Participate in community, social, civic, or cultural service.
- #14. Demonstrate knowledge, skills, and self-discipline necessary to achieve and maintain physical and emotional well being.

II. STUDENT LEARNING OUTCOMES

1. Medical-Legal Issues

- Students will in a written examination describe the legal environment associated with pre-hospital medical care.
- Students will in written examinations and simulations demonstrate knowledge of the importance of acting within the scope of training and protocols.
- Students will in simulations provide clear and accurate documentation of patient assessment and treatment.

2. Blood-Borne Pathogens

- Students will in a written examination identify and describe the modes of transmission of communicable diseases and OSHA requirements for protecting emergency care providers from pathogens.
- Students will in simulations demonstrate practices and techniques to assure body substance isolation.

3. Patient Assessment

- Students will in simulations assess and manage a scene for safety, identify and manage initial potentially life-threatening problems, obtain a set of vital signs, obtain a history, perform a patient exam, document patient care, and perform ongoing assessments.

4. Airway Management

- Students will in a written examination describe the anatomy and physiology of the airway.
- Students will in a simulation demonstrate techniques to maintain an open airway, including use of oropharyngeal airways.
- Students will in a simulation make decisions for extended care and evacuation of patients.

5. Shock

- Students will in a written examination describe the signs and symptoms and physiology of shock.
- Students will in a simulation recognize and manage shock and make extended care and evacuation decisions.

6. Wound Management

- Students will in a written examination describe the anatomy and physiology of the integumentary system, the normal healing process, and signs and symptoms of infection.
- Students will in simulations manage soft tissue injuries, including demonstration of effective bandaging techniques, recognize and manage wound infections, and make extended care and evacuation decisions.

7. Thermal Burns

- Students will in a simulation evaluate and manage a burn injury and make extended care and evacuation decisions.

8. Sprains and Strains

- Students will in a written examination describe the anatomy and physiology of the musculoskeletal system.
- Students will in a simulation recognize and manage sprains and strains and make extended care and evacuation decisions.

9. Fractures

- Students will in simulations recognize and manage fractures, demonstrating effective splinting techniques, and will make extended care and evacuation decisions.

10. Dislocations

- Students will in a written examination describe the circumstances under which a dislocation should be reduced in the field.
- Students will in a simulation demonstrate the techniques for shoulder, patella, distal dislocation reduction.
- Students will in simulations immobilize unreduced dislocations.
- Students will in simulations make decisions about the short-term and extended care of dislocations and make evacuation decisions.

11. Head and Facial Trauma

- Students will in a written examination describe the anatomy and physiology of the brain and the progression of brain injuries.
- Students will in simulations differentiate between and manage head wounds and brain injuries and make extended care and evacuation decisions.

12. Spinal Column/Cord Injuries

- Students will in a written examination describe the anatomy and physiology of the nervous system, the signs and symptoms for spinal column/cord injuries, and protocols for treatment.
- Students will in simulations recognize potential spinal injuries, assess and manage spinal column/cord injuries, and make extended care and evacuation decisions.

13. Chest Trauma

- Students will in simulations assess and manage chest trauma and make extended care and evacuation decisions.

14. Abdominal Trauma

- Students will in simulations assess and manage abdominal trauma and make extended care and evacuation decisions.

15. Lightning

- Students will in a written examination describe the potential danger of thunderstorms and appropriate action to take in one.
- Students will in simulations recognize and manage injuries associated with a lightning storm and make extended care and evacuation decisions.

16. Heat Injuries and Dehydration

- Students will in a written examination describe the physiology of the thermoregulatory system, including mechanisms of heat production and loss, and the signs and symptoms of dehydration, heat exhaustion and heat stroke.
- Students will in a written examination describe preventative measures to heat injuries
- Students will in the field take appropriate action to prevent heat injuries.
- Students will in simulations assess and manage dehydration, heat exhaustion, and heat stroke and make extended care and evacuation decisions.

17. Cold Injuries

- Students will in a written examination describe the signs and symptoms of hypothermia and frostbite and appropriate treatment.
- Students will in a written examination describe preventative measures for cold injuries.
- Students will in the field take appropriate action to prevent cold injuries.
- Students will in simulations assess and manage hypothermia and frostbite and make extended care and evacuation decisions.

18. North American Bites and Stings

- Students will in a written examination describe how to prevent, recognize, and manage envenomations, and provide wound care for animal bites.
- Students will in simulations assess and manage snake and insect envenomations and animal bites and make extended care and evacuation decisions.

20. Allergies and Anaphylaxis

- Students will in simulations assess and manage allergic reactions, including severe anaphylaxis, and make extended care and evacuation decisions.

21. Altitude Emergencies

- Students will in a written examination describe the physiology of acute mountain sickness, high altitude pulmonary edema, and high altitude cerebral edema.
- Students will in a written examination describe the assessment and management of and preventative measures for AMS, HAPC, and HACE.

22. Drowning

- Students will in a written examination describe the pathophysiology of drowning, including the differences between immersion and submersion.
- Students will in a written examination describe how to prevent drowning, including that of rescuers.
- Students will in a written examination describe rescue and management procedures for drownings.

23. Water-borne and Food-borne Illnesses

- Students will in a written examination describe the management of patients with diarrhea.
- Students will in the field demonstrate effective techniques of water disinfection, food handling and preparation, and camp hygiene to prevent illness.

24. Emergency Childbirth

- Students will in a written examination describe the management of an emergency childbirth, including techniques of delivery, recognition of emergencies (breech births and prolapsed cords), and extended care considerations.
- Students will in a simulation deliver a baby.

25. Neurological – Changes in Level of Consciousness

- Students will in a written examination describe the anatomy and physiology of the nervous system.
- Students will in a written examination describe assessment and management of unconscious patients, seizure disorders, and cerebrovascular accidents.

- Students will in simulations assess and manage unconscious patients, seizure disorders, and CVAs and make extended care and evacuation decisions.

26. Respiratory Distress

- Students will in a written examination describe the anatomy and physiology of the respiratory system.
- Students will in an examination describe assessment and management of respiratory distress, including respiratory arrest.
- Students will in a simulation demonstrate correct techniques for infant, child, and adult rescue breathing, including the use of barrier shields, resuscitation masks, bag-valve masks, and supplemental oxygen.
- Students will in a simulation assess and manage a respiratory emergency and make extended care and evacuation decisions.

27. Cardiology – Chest Pain

- Students will in a written examination describe the anatomy and physiology of the cardiovascular system and cardiac risk factors.
- Students will in written examinations identify and describe the protocols for one and two-person infant, child, and adult cardiopulmonary resuscitation (CPR).
- Students will in a simulation demonstrate the correct procedures for one and two-person infant, child, and adult CPR.
- Students will in simulations assess and manage cardiac emergencies and make extended care and evacuation decisions.

28. Abdominal Pain

- Students will in a written examination describe the anatomy and physiology of the digestive system.
- Students will in a written examination describe assessment and management of abdominal pain, including extended care and evacuation considerations.

29. Gender Related Injuries and Illnesses

- Students will in a written examination describe assessment and management of common urogenital injuries and illnesses, including extended care and evacuation considerations.
- Students will in the field demonstrate the practice of proper hygiene to prevent urogenital illnesses.

30. Diabetes

- Students will in a written examination describe the physiology of glucose metabolism and the assessment and management of diabetic emergencies.

- Students will in a simulation assess and manage a diabetic emergency and make extended care and evacuation decisions.

31. Psychiatric and Suicidal Emergencies

- Students will in written examinations and class discussion describe how to assess and manage psychiatric and suicidal emergencies.

32. Drug and Alcohol Emergencies

- Students will in written examinations and class discussion describe how to assess and manage drug and alcohol emergencies.

33. Common Simple Expedition Problems

- Students will in the field and in simulations assess and manage common simple medical problems, including headaches, coughs, colds, fevers, sore throats, nosebleeds, diarrhea, constipation, nausea, vomiting, splinters, fishhook injuries, hemorrhoids, sunburns, sun bumps, snow blindness, rashes, fungal infections, contact dermatitis, motion sickness, conjunctivitis, corneal abrasions, blisters, and dental problems.

34. Search and Rescue

- Students will in simulations conduct immediate simple searches and demonstrate knowledge of the essentials of participating in an organized search and rescue.

35. Packaging and Transportation

- Students will in simulations demonstrate simple lifts and moves of patients including walking assist, firefighter's carry, clothes drag, two person seat carry, pack-strap carry, blanket drag, foot drag, extremity lift, and direct carry.
- Students will in simulations apply cervical collars to patients.
- Students will in simulations package patients in a variety of manufactured and improvised litters, ensure thermoregulation, provide extended patient care in a litter, and manage transportation consideration and safety.

36. Multiple Casualty Incidents

- Students will in written examinations identify and describe the principles of the Simple Triage And Rapid Treatment (START) system.

37. Critical Incident Stress Management

- Students will in written examinations and class discussion describe the potential impact of a critical incident on rescuers and the resources available for management of critical incident stress.

III. ASSESSMENT

A. Student Assessment

Students will be assessed by performance tasks and written tests. Two types of performance tasks will be employed: in-class skills demonstrations (e.g., splinting a leg) and simulations (moulages) in which students must assess, manage, and debrief patients in stress induced situations. Two types of test methodologies will be used: problem solving in pairs (scenarios) and individual tests.

To obtain Red Cross certification, students will score 80% or better on a 100 question multiple choice exam and satisfactorily demonstrate mastery of all the required skills.

B. Course Assessment

The success of the course will be judged by the number of students who 1) receive a C or better in the course, 2) receive First Responder and CPR for the Professional Rescuer certification, and 3) a student survey.

IV. METHODS AND MATERIALS

A. Methods

Instruction will be designed so that students will be actively involved in the learning process. There will be a strong emphasis on hands-on learning, group problem solving, and application of principles covered in readings, lectures, and class discussions. Students will have opportunities to debrief and reflect upon their performance in simulations.

B. Materials

Primary texts:

J. Isaac, *The Outward Bound Wilderness First-Aid Handbook*

American Red Cross, *Emergency Response*

Additional texts:

B. Tilton, *The Wilderness First Responder*

T. Schimelpfenig and L. Lindsay, *NOLS First Aid*

J. Wilkerson, ed., *Medicine for Mountaineering*

H. Backer, et al., *Wilderness First Aid: Emergency Care for Remote Locations*

C. Houston, *Going Higher: The Story of Man and Altitude*

J. Wilkerson, et al., *Hypothermia, Frostbite, and Other Injuries*

S. Bezruchka, *Altitude Sickness: Prevention and Treatment*

H. Grant, et al., *Brady Emergency Care*

W. Bowman, *The National Ski Patrol's Outdoor Emergency Care*

Journals:

Wilderness and Environmental Medicine

Wilderness Medicine Letter

Wilderness Medicine Newsletter

Other materials:

A wide variety of materials will be used including bandaging and splinting materials, stethoscopes, blood pressure cuffs, litters, injectable epinephrine, CPR manikins, childbirth manikins, moulage materials (fake blood, wounds, etc.), automated external defibrillator trainers, cervical collars, supplementary oxygen, resuscitation masks, and others.

C. **Technology**

A video camera will be utilized to record debrief simulations.

V. GENERAL INFORMATION

Wilderness Medicine is a 5 credit course open to students in the Team Program at Tamiscal High School.

There are no prerequisites.

This course may be used as elective credit towards graduation but does not meet any specific graduation requirement.

BOT Approved: 3/14/00